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Consumer choice and the quality of home care for the elderly

Mats A. Bergman, Henrik Jordahl and Sofia Lundberg

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Abstract: Assistance to the elderly in their homes has traditionally been provided by the Swedish municipalities. Since the early 1990s, however, an increasing fraction of the assistance services have been procured from private providers. In 2009 new legislation was enacted that allowed the municipalities to organize consumer-choice (or voucher) systems, i.a. for elderly care. Under the new rules, licensed private providers compete with the municipalities’ in-house provision for customers. In 2013 private firms accounted for about a fifth of all provision.

We study how private provision and the introduction of a consumer-choice system influences quality, as perceived by the elderly. We use a national survey with responses from approximately 50 000 elderly, in which the respondents were asked to grade overall quality of the home-assistance service, as well as quality in particular dimensions, such as “ability to influence” and “opportunities for out-door activities”.

We study the effect of the introduction of a choice system with a difference-in-differences approach, using data at the municipal level. We find evidence that choice systems increase perceived user satisfaction.
Introduction

The Swedish market for elder care and the legislative framework
Since 1992 the Swedish municipalities are exclusively responsible for elder care, except medical care involving physicians, for which counties are responsible. Close to 100,000 persons live permanently in elder care units (or nursing homes), while more than 150,000 receive assistance in their homes. The total cost of elder care was approximately SEK 90 billion in 2012, or close to 3 percent of GDP.\(^1\) Income-dependent fees cover on averages 4 percent of the cost, with the municipalities paying the rest.

Until the 1990s, elder care was produced almost exclusively within the public sector. In 1989, however, this de facto exclusivity was challenged by Nacka, a suburb to Stockholm. A court ruling established that the municipality had the right to outsource elder care to private providers.\(^2\)

In the early 1990s, Nacka and other suburbs to Stockholm introduced user-choice (or voucher) systems. Several municipalities followed their lead, although the legal status of these systems remained unclear until January, 2009, with the introduction of the Act of Free Choice System.

At the end of 2006, before the new legislation was introduced, 27 municipalities had introduced a choice system. Since 2009 the number of choice systems has increased rapidly, reaching 147, more than 50 percent of all municipalities, by October 2013. In 2012 around 20 percent of all elderly that received home help did so from a private provider. (Bergman and Jordahl, 2014.)

Figure 1 shows how the introduction dates are distributed over time.

\(^{1}\) NBHW, 2009.
\(^{2}\) Jordahl och Öhrvall, 2013
While choice systems dominate the home-care segment, procurement has been the dominant form of outsourcing of nursing-home care. In addition to the court decision mentioned above, a key step in this process was the introduction, in 1994, of a procurement act that conformed to the EU’s public procurement directives.

Relatively large firms, often owned by private-equity firms, dominate the private segment of the nursing-home market; private providers have a market share of around 20 percent also in this segment. In the market for home care, small firms, even proprietorships, are much more successful, in particular after the introduction of choice systems. In 2013 there were 618 firms that provided home care within a municipal choice system; of those 443 were active in one municipality only. Stockholm, the largest city, had around 150 active firms while small rural municipalities tended to have two or three active firms. (SOU 2014:2.) However, not all private provision takes this form; some municipalities still procure home-care services. The municipality may also procure home care for those users that decline from making a choice.

Data collection and descriptive statistics
Since 2008 the NBWH has asked users and their relatives how satisfied they are, overall, with the quality of the service provided in home care for elderly (and with care provided in nursing
homes), as well as their views on particular aspects of the care they receive. During the first years, the respondents were asked to give replies on a scale from 1 to 10. By multiplying the average response with 10, a customer satisfaction index (CSI) ranging from 10 to 100 was generated. This data is available on the municipality level only, not for individual nursing homes. Similar studies were made four times, up until 2011.

About half of those that received elder care were surveyed and the response rate was around 60 percent. The first survey was undertaken between August and October 2008 and published in 2009.³ Beside their overall view, the respondents were asked about the quality of the information they received, the staff’s attitude, user influence, to what extent they felt safe, if they were satisfied with the extent of care, the food quality, the cleaning and hygiene, the provision of health-care services, social interaction and activities and, finally, about the standard of the room and the facility.

In 2012 the survey was modified. Most importantly, the respondents were now asked to give their replies on a, in most instances, five-graded scale. For example, if they were “very satisfied”, “satisfied”, etc. The key measure used by the NBHW to summarize the new version of the survey is the sum of the share of the respondents that answered in the two most positive categories. A comparison of the two measures, for 2011 and 2012, is made in Figure 2.

³ NBHW (2009).
Figure 2. Overall satisfaction with home care in 2011 and 2012, per municipality

Comment: Different measures of satisfaction were used in the two years.

Another change was that all elderly that receive assistance are now surveyed; furthermore, since 2013, results are also reported at the level of individual institutions (for nursing homes) and by provider (for home care), given that there are at least 30 responses. In large municipalities, answers are further subdivided also by district if there are enough responses.

**Analysis**

We can compare three categories of municipalities: those that had introduced a choice system already in 2007, those that introduced a choice system between 2007 and October 2013, and those that had not introduced such a system by October 2013. There are 27, 120 and 146 those categories, respectively.\(^4\)

A complication is the change of method in the 2012 survey, in combination with the fact that many of the choice systems were introduced between 2011 and 2013. In March 2010, there were 45 choice systems, in October the same year the number had increased to 68, in April the

---

\(^4\) Three of the municipalities that had a choice system in 2006 are reported as not having a choice system in 2013. These municipalities were excluded from the analysis. Another data set suggests that 123 municipalities introduced a user-choice system during the four years 2009-2012.
following year there were 87 systems, in October 2011 there were 94 and in October, 2013, there were 147 such systems.\(^5\)

To overcome this problem, we compare the rank of the municipalities. Figure 3 shows the average rank for the three categories of municipalities mentioned above. The municipality with the most satisfied users has rank 1; hence a falling average rank indicates an improvement.\(^6\)

Figure 3. Average ranks of municipalities with and without a choice system and for municipalities that introduced a choice system, 2008 and 2013.

It is immediately apparent that those municipalities that had a choice system already in 2006 perform worse than average and, furthermore, that their average performance has decreased in relative terms. The municipalities that still have not introduced a choice system have seen their performance deteriorate somewhat, while the municipalities that introduced a choice system between 2007 and 2013 have improved their ranking.

[The differences between those that introduced a system during the period of observation and those that have not introduced a system are not statistically significant, when just looking at the raw numbers. Due to the relatively small number, the differences to those that always had a system are probably not significant either. However, we may find significance if these effects are

\(^5\) Statskontoret, 2012; Bergman and Jordahl, 2014.

\(^6\) The ranks are taken from the reports Öppna jämförelser - vård och omsorg om äldre 2009 and 2013, respectively. The reports are published jointly by SKL and the NBHW. Since two municipalities that have the same values are given the same rank and since the number of draws will differ between the years, the average rank values will not be the same for both years. To correct for this effect, the change of the average rank has been subtracted from the 2013 values in the graph.
estimated in a real panel-data fixed-effect model. For example, the long time span between the
two dates introduces more noise than necessary; using precise dates for the introduction of the
systems will likely increase precision.

Conclusions
Text …
References


SOU 2014:2, Framtidens valfrihetssystem – inom socialtjänsten. Betänkande av Utredningen om framtida valfrihetssystem inom socialtjänsten

Administrative Capacity for Reconstruction Procurement: Lessons Learnt from the Great East Japan Earthquake

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2-17-1 Fujimi, Chiyoda-ku,
Tokyo, 102-8160 Japan
E-mail: sakane@hosei.ac.jp

ABSTRACT: After the Great East Japan Earthquake on 11th March 2011, various types of public procurement and administrative activities suddenly became necessary. One of the major categories is reconstruction works of infrastructures. In order to implement such procurement, shortage of engineering officers including those who conduct procurement-related roles and public servants in general has been a very significant problem. Number of newly employed permanent public servants in the tsunami-stricken areas were quite limited compared to the huge increase of procurement and administrative demand for reconstruction. Taking these situations into account, this paper analyses how Japanese municipal, prefectoral and national governments struggled to overcome such a human capacity constraint. As a result of entire analysis, importance of receiving dispatched officers from different governments within Japan is revealed. At the same time, some challenges and remaining problems are made clear.

INTRODUCTION

The Great East Japan Earthquake on 11th March 2011 damaged heavily people, society, infrastructure and land of the Pacific costal area in Tohoku region. However, many survived people there have been strongly and patiently tackling on their own lives and also contributing to alleviate family, neighbour, social and local problems in each community, town and city by receiving encouragement, sympathy, helps and understandings from the Tohoku region, other regions in Japan and even other countries all over the world. It is a firm political, social and national will that Japanese government and people unite and assist for the recovery and reconstruction of Tohoku damaged areas and people as much as they can. Actually, huge amount of budget has already been allocated and spent and is going to be spent more from now on too. Despite that, there are various legal, social and practical problems to accelerate such recovery and reconstruction efforts. For example, to identify and fix land owners is a big difficulty especially in tsunami-stricken areas. Also, for example, to get consensus about where the new town and community shall be constructed is another problem. Especially in the coastal community, if new community is established in same location, though risk of future tsunami damage is high, it is convenient for fisheries and other

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vocational and social activities. Therefore, to relocate community and new town on inland hillside is not an easy choice realistically.

Among many problems, the administrative capacity matter is one of the most important and difficult problem. The tsunami and earthquake suddenly created lots of huge amount of necessary administrative works. One of the major categories is reconstruction works of infrastructures because the tsunami and earthquake destroyed infrastructures heavily. To implement procurement for infrastructure has many obstacles but one of them is the shortage of public servants especially in the area of civil engineering including procurement-related officers. Number of newly employed permanent public servants including procurement-related officers in the tsunami-stricken areas was quite limited compared to the huge increase of administrative and procurement demand for reconstruction. Therefore, how administration in Japan is tackling on this administrative capacity matter including civil engineering procurement capacity? This paper analyses and answers this research question mainly by referring to official documents and also information collected from administration.

On the former IPPC (International Public Procurement Conference), i.e. on IPPC 2012, public procurement after the Great East Japan Earthquake has been presented as “A Sustainable Public Procurement System for Large-scale Natural Disasters: the Case of the Temporary Housing Program after the East Japan Earthquake”. In that presentation paper, in-depth analysis about procurement of temporary housing was conducted and to maintain time-consistency on policy was pointed out (Tanaka, 2012). This paper’s research interest lies on reconstruction procurement as a whole and on shortage of public servants’ capacity especially in civil engineering including procurement-related officers. So, this paper has different viewpoint and therefore, it has added value by showing different points of lessons learnt. Actually, on another academic paper, human resource matter in general was regarded as important and especially shortage of civil engineering was pointed out. On that paper, bottom up dispatch effort was basically recommended but it also pointed out that to secure enough civil engineering is difficult only by it and advocated that top down approach is needed too (Sakamoto and Yamori, 2012, pp. 397-398). So, on this paper, various mechanisms both bottom up and top down are analysed.

This paper consists of following sections. The first section explains background situations of structural human resource shortage. Structural shortage of public servants including those who are engaging in civil engineering and its procurement-related works is made clear by showing statistics such as dramatic increase of budget and human resource needs. The second section explores recruitment and the third section explores dispatch. In these two sections, after overview, major recruitment and dispatch types and other supplemental measures are made clear respectively. Finally, the entire analyses above are summarized and some implications are addressed.

Main focus of this paper is going to be on municipal governments. In Japan, there are three levels of governments, i.e. central government, prefectural governments and municipal governments. Municipal governments are city town and village. Municipal governments are important for reconstruction because they are regarded as main responsible governments to plan and implement the reconstruction in each administrative area. Although increase of human resource needs in central and damaged prefectural governments are both eminent, the dramatic increase of its needs in the tsunami-stricken municipal governments is more serious. Therefore, it is worth to be analysed.

Though there are three most damaged prefectures, i.e. Iwate, Miyagi and Fukushima, this paper focuses on Miyagi. Fukushima’s damage is very complex because the destroyed nuclear power plants locate in Fukushima. Damages of Iwate and Miyagi are both mostly by the tsunami and earthquake but number of casualties in Miyagi is much more than that in Iwate. Casualty number in Miyagi is more than 10 thousands, while more than 5 thousands in Iwate and more than 3 thousands in Fukushima. Miyagi is the biggest
prefecture in Tohoku region in terms of both population and GDP. Reconstruction of Miyagi is especially the key to the future advancement and development of Tohoku region and even Japan as a whole too.

**BACKGROUND SITUATIONS**

**Budget Increase after the Great Eastern Japan Earthquake**

The tsunami-stricken municipal governments in Miyagi prefecture faced enormous budget increase after the tsunami and earthquake on 11th March 2011. Such budget increase is apparent not only during emergency period but also during reconstruction period. The Japanese central government regards 5 years after the disaster as the intensive reconstruction period. During that period, especially public investment expense to restorative construction including reconstruction of public infrastructure, land readjustment, community relocation to hillside from coast side, construction of public housing project and so on is marking the tremendous increase. Such tendency is especially eminent on heavily destroyed cities and towns. The following table shows the budget level comparison of public investment expense between the original 2010 fiscal year budget that is before the tragedy and the 2013 fiscal year budget that is after the tragedy and is during intensive reconstruction period. Public procurement is very important on the process of implementation of such public investment expenses.

Table 1: Comparison of Public Investment Expense between the Original 2010 Fiscal Year Budget and the 2013 Fiscal Year Budget

<table>
<thead>
<tr>
<th>Town</th>
<th>2013 fiscal year (million yen)</th>
<th>2010 fiscal year (million yen)</th>
<th>Ratio (times)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yamamuto Town</td>
<td>27,194</td>
<td>238</td>
<td>114.3</td>
</tr>
<tr>
<td>Watari Town</td>
<td>45,318</td>
<td>419</td>
<td>108.2</td>
</tr>
<tr>
<td>Minamisanriku Town</td>
<td>44,560</td>
<td>527</td>
<td>84.6</td>
</tr>
<tr>
<td>Sichigahama Town</td>
<td>6,053</td>
<td>149</td>
<td>40.6</td>
</tr>
<tr>
<td>Kesennuma City</td>
<td>64,622</td>
<td>2,373</td>
<td>27.2</td>
</tr>
<tr>
<td>Matsushima Town</td>
<td>8,517</td>
<td>317</td>
<td>26.9</td>
</tr>
<tr>
<td>Onagawa Town</td>
<td>13,076</td>
<td>629</td>
<td>20.8</td>
</tr>
<tr>
<td>Ishinomaki City</td>
<td>86,598</td>
<td>5,651</td>
<td>15.3</td>
</tr>
<tr>
<td>Higashimatsushima City</td>
<td>16,645</td>
<td>2,035</td>
<td>8.2</td>
</tr>
<tr>
<td>Iwanuma City</td>
<td>21,880</td>
<td>3,467</td>
<td>6.3</td>
</tr>
<tr>
<td>Shiozaki City</td>
<td>9,570</td>
<td>1,601</td>
<td>6.0</td>
</tr>
<tr>
<td>Natori City</td>
<td>12,106</td>
<td>2,966</td>
<td>4.1</td>
</tr>
<tr>
<td>Tagajo City</td>
<td>6,207</td>
<td>1,975</td>
<td>3.1</td>
</tr>
<tr>
<td>Sendai City</td>
<td>133,280</td>
<td>52,106</td>
<td>2.6</td>
</tr>
<tr>
<td>Rifu Town</td>
<td>2,757</td>
<td>1,133</td>
<td>2.4</td>
</tr>
</tbody>
</table>


**Shortages of Public Servants**

Faced on such a dramatic increase of public investment expense, these heavily tsunami-stricken Miyagi 15 municipal governments must prepare additional public servants including those who conduct procurement-related works to tackle on this situation. However, to secure sufficient number of public servants is not easy at all. Actually as the two next table shows, shortage of public servants is one of the serious problems for them.
Table 2: Needs, Fulfilment and Remaining Shortage of Public Servants in the 15 Tsunami-stricken Miyagi Municipal Governments as of 1st March 2014

<table>
<thead>
<tr>
<th></th>
<th>Needs</th>
<th>Fulfilment</th>
<th>Shortage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sendai City</td>
<td>117</td>
<td>115</td>
<td>2</td>
</tr>
<tr>
<td>Ishinomaki City</td>
<td>292</td>
<td>256</td>
<td>36</td>
</tr>
<tr>
<td>Shiogama City</td>
<td>44</td>
<td>44</td>
<td>0</td>
</tr>
<tr>
<td>Kesennuma City</td>
<td>236</td>
<td>200</td>
<td>36</td>
</tr>
<tr>
<td>Natori City</td>
<td>89</td>
<td>73</td>
<td>16</td>
</tr>
<tr>
<td>Tagajo City</td>
<td>43</td>
<td>43</td>
<td>0</td>
</tr>
<tr>
<td>Iwanuma City</td>
<td>51</td>
<td>45</td>
<td>6</td>
</tr>
<tr>
<td>Higashimatsushima City</td>
<td>104</td>
<td>102</td>
<td>2</td>
</tr>
<tr>
<td>Watari Town</td>
<td>51</td>
<td>50</td>
<td>1</td>
</tr>
<tr>
<td>Yamamoto Town</td>
<td>114</td>
<td>101</td>
<td>13</td>
</tr>
<tr>
<td>Matsushima Town</td>
<td>19</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>Sichigahama Town</td>
<td>25</td>
<td>24</td>
<td>1</td>
</tr>
<tr>
<td>Rifu Town</td>
<td>9</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Onagawa Town</td>
<td>61</td>
<td>55</td>
<td>6</td>
</tr>
<tr>
<td>Minamisanriku Town</td>
<td>118</td>
<td>111</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1373</strong></td>
<td><strong>1243</strong></td>
<td><strong>130</strong></td>
</tr>
</tbody>
</table>

Source: Miyagi Prefectural Government. (2014a). “Staff Shortage Situation in the 15 Coastal Municipal Governments in 2013 Fiscal Year (as of 1st March 2014)”.

Shortage of public servants is overall tendency within these 15 municipal governments. However, as the next table shows, the shortage is especially eminent on civil engineering. Compared to the shortage number 45 in general administration including land administration and taxation, shortage of civil engineering is 85. This shortage of civil engineering includes land readjustment, water and sewerage, collective relocation, fishery harbour and so on. In combining architecture engineering and agricultural civil engineering, the total shortage number of these three categories is 100. As the total shortage of public servants in the 15 municipal governments is 130, more than three fourth of shortage is actually civil engineer and its related public servants. Civil engineer is essential to the implementation of public procurement of the reconstruction such as roads, housing, land adjustments, ports, public facilities and so on.

Table 3: Total Shortage of Public Servants in the 15 Tsunami-stricken Miyagi Municipal Governments listed in Table 2 as of 1st March 2014

<table>
<thead>
<tr>
<th></th>
<th>Needs</th>
<th>Fulfilment</th>
<th>Shortage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Engineering</td>
<td>741</td>
<td>656</td>
<td>85</td>
</tr>
<tr>
<td>General Administration</td>
<td>632</td>
<td>587</td>
<td>45</td>
</tr>
<tr>
<td>Health Outreach</td>
<td>31</td>
<td>19</td>
<td>12</td>
</tr>
<tr>
<td>Architecture</td>
<td>122</td>
<td>112</td>
<td>10</td>
</tr>
<tr>
<td>Agricultural Engineering</td>
<td>31</td>
<td>26</td>
<td>5</td>
</tr>
<tr>
<td>Machinery</td>
<td>13</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Cultural Property</td>
<td>15</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Electricity</td>
<td>15</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>35</td>
<td>34</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1373</strong></td>
<td><strong>1243</strong></td>
<td><strong>130</strong></td>
</tr>
</tbody>
</table>

Source: Miyagi Prefectural Government. (2014b). “Staff Shortage Situation in the 15 Coastal Municipal Governments in 2013 Fiscal Year: Classified by Job Category (as of 1st March 2014)”.

4
As is explained above, shortage of public servants especially civil engineering including procurement-related officers is still ongoing challenge. However, many efforts to tackle on it have been done and due to that, shortage has been alleviated dramatically. The next two sections explain two main ways of efforts.

Recruitment

Overview of Recruitment

The next Table is the overview of recruitment. 15 tsunami-stricken municipal governments recruited 289 public servants in total to fulfil the gap. The number is a bit less than one fourth of total fulfilment, i.e. about 23%. Actually, there are several varieties of recruitment ways and categories.

Table 4: Number of Received Public Servants to Fulfil the Shortage

<table>
<thead>
<tr>
<th></th>
<th>Permanent Recruitment</th>
<th>Fixed-term Recruitment</th>
<th>Reappointment</th>
<th>Recruitment from Municipal Governments Retired</th>
<th>Recruitment from Private Sector</th>
<th>Recruitment Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sendai City</td>
<td>8</td>
<td>43</td>
<td></td>
<td>2</td>
<td>53</td>
<td>53</td>
</tr>
<tr>
<td>Ishinomaki City</td>
<td>6</td>
<td>47</td>
<td>18</td>
<td>3</td>
<td>74</td>
<td>74</td>
</tr>
<tr>
<td>Shiogama City</td>
<td>5</td>
<td>2</td>
<td></td>
<td>7</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Kesennuma City</td>
<td>24</td>
<td></td>
<td>3</td>
<td>10</td>
<td>37</td>
<td>37</td>
</tr>
<tr>
<td>Natori City</td>
<td>3</td>
<td>16</td>
<td>8</td>
<td></td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>Tagajo City</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Iwanuma City</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Higashimatsushima City</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>Watari Town</td>
<td>23</td>
<td>1</td>
<td>2</td>
<td></td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Yamamoto Town</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Matsushima Town</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Sichigahama Town</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Rifu Town</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Onagawa Town</td>
<td>4</td>
<td>3</td>
<td></td>
<td>1</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Minamisanriku Town</td>
<td>10</td>
<td>4</td>
<td></td>
<td></td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22</strong></td>
<td><strong>206</strong></td>
<td><strong>12</strong></td>
<td><strong>32</strong></td>
<td><strong>17</strong></td>
<td><strong>289</strong></td>
</tr>
</tbody>
</table>

Source: Miyagi Prefectural Government. (2014a). “Staff Shortage Situation in the 15 Coastal Municipal Governments in 2013 Fiscal Year (as of 1st March 2014)”.

Recruitment of Fixed-term Public Servants

Most typical recruitment type is fixed-term. Its term has been set normally around 1 or 2 years and 5 years in total as maximum even in the case of renewal because public reconstruction work is regarded not permanent administrative activity but limited and rather intensive activity. So, recruitment of many permanent public servants is regarded as not suitable considering mid-term and longer-term budgetary implications and human resource management policy.

As the above Table 4 shows, though normally recruitment is the basic way of fulfil the gap, actually recruitment is the supplementary option for the most of tsunami-stricken Miyagi municipal governments. There are some exceptions. Most eminent example is Sendai city. It recruited 43 out of 115 fulfilment amounting to 37%. It also recruited 8 permanent public servants and 2 public servants from private companies. So, Sendai city succeeded to fulfil nearly half of the gap, i.e. 46%, by various recruitment. However, such municipal governments is quite exceptional case besides Watari town which recruited 26 out of 50 fulfilment amounting to 52%.
Other Mechanisms

In addition, though not so many as recruitment of fixed term, there are several other recruitment mechanisms. These are recruitment of permanent public servants, recruitment of retired public servants and reappointment. There is a scheme to recruit those who have already retired from another municipal government. Municipal governments across Japan provide retired personnel information to Japan Association of City Mayors or National Association of Towns & Villages respectively. These two associations provide its information to MIC (Ministry of Internal Affairs and Communications) and MIC creates candidate list and forward it to the tsunami-stricken municipal governments. Each municipal governments can recruit based on the list directly (MIC, 2013).

However, not only recruitment of permanent public servants, recruitment of retired public servants and reappointment are also not so many used. Several difficulties can be pointed out. For example, retired personnel and reappointment personnel must accept not only dramatic down of salary but also must adjust themselves in lower position than before. Most of tsunami-stricken municipal governments are relatively small offices and can’t normally offer various high positions (Miyagi Prefectural Government Tokyo Office, Mr. Sato).

Dispatch

Overview of Dispatch

Interestingly, not recruitment but dispatch is the most used way to fulfil the gap. As the next Table shows, total dispatch number (954) is more than three times of total recruitment number (289) in the Miyagi 15 tsunami-stricken municipal governments on 1st March 2014. Actually, there are several dispatch mechanisms.

Table 5: Number of Dispatched Public Servants Received to Fulfil the Shortage

<table>
<thead>
<tr>
<th>Source: Miyagi Prefectural Government. (2014a). “Staff Shortage Situation in the 15 Coastal Municipal Governments in 2013 Fiscal Year (as of 1st March 2014)”</th>
<th>Sendai City</th>
<th>Ishinomaki City</th>
<th>Shiohama City</th>
<th>Kesennuma City</th>
<th>Natori City</th>
<th>Tagajo City</th>
<th>Iwanuma City</th>
<th>Higashimatsushima City</th>
<th>Watari Town</th>
<th>Yamamoto Town</th>
<th>Matsushima Town</th>
<th>Sichigahama Town</th>
<th>Rifu Town</th>
<th>Onagawa Town</th>
<th>Minamisanriku Town</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIC Scheme</td>
<td>20</td>
<td>58</td>
<td>14</td>
<td>53</td>
<td>16</td>
<td>8</td>
<td>20</td>
<td>27</td>
<td>12</td>
<td>33</td>
<td>5</td>
<td>18</td>
<td>1</td>
<td>5</td>
<td>34</td>
<td>323</td>
</tr>
<tr>
<td>Reconstruction Agency Scheme</td>
<td>1</td>
<td>8</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>25</td>
<td>2</td>
<td>7</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>9</td>
<td>4</td>
<td>45</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>66</td>
<td>9</td>
<td>58</td>
<td>2</td>
<td>25</td>
<td>15</td>
<td>29</td>
<td>7</td>
<td>29</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>30</td>
<td>332</td>
<td>44</td>
</tr>
<tr>
<td>Dispatch after Recruitment by Miyagi Prefectural Government</td>
<td>42</td>
<td>4</td>
<td>12</td>
<td>39</td>
<td>21</td>
<td>6</td>
<td>3</td>
<td>12</td>
<td>5</td>
<td>17</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>7</td>
<td>189</td>
<td>21</td>
</tr>
<tr>
<td>Dispatch from Municipal Governments in Miyagi</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>11</td>
<td>21</td>
<td>7</td>
<td>96</td>
<td>11</td>
<td>47</td>
<td>97</td>
<td>954</td>
<td>62</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Miyagi Prefectural Government. (2014a). “Staff Shortage Situation in the 15 Coastal Municipal Governments in 2013 Fiscal Year (as of 1st March 2014)”.
Self-Arrangement

Within several dispatch varieties, self-arrangement can be said as the most basic style. It means that each tsunami-stricken municipal government arranges dispatch with other municipal governments and prefectures. Typical examples are dispatches based on disaster mutual cooperation agreement and dispatches based on sister-city or twin town relationship. Also, self-arrangement can be possible. In addition to these pre-established and pre-concluded relationship, negotiation and request after the disaster is also one way.

However, self-arrangement has lots of varieties. Actually, it includes cooperative arrangement too. For example, Tokyo metropolitan government advertised about 41 fixed-term public servants for 10 damaged municipal governments in Iwate, Miyagi and Fukushima prefectures in April 2012. In Miyagi prefecture, Kesennuma City, and Minamisanriku Town were selected. According to the application guide, work contents were described as order placement, designing, cost calculation, construction supervision, land adjustment and so on (Tokyo Metropolitan Government, 2012). Here, it is apparent that construction procurement and its related works were contained in this civil engineering and architecture engineering human resource needs. Though this application is issued in April 2012 and 47 were employed since September 2012 as one year fixed-term, most of public servants were renewed its term and 42 are still working at the 10 municipal governments as of March 2014. This self-arrangement became possible with cooperation of Tokyo metropolitan government, Iwate, Miyagi and Fukushima prefectural governments, and national governments. Tokyo metropolitan government took the role of advertisement, employment, training and dispatches. Three prefectural governments contributed to identify damaged municipal governments’ human resource needs and send these needs to Tokyo metropolitan government after adjustment and coordination. National government guaranteed to compensate for this employment cost to Tokyo metropolitan government (Tokyo Metropolitan Government, Bureau of General Affairs, Mr. Shibasaki).

MIC Scheme

MIC (Ministry of Internal Affairs and Communications) is taking especially an important role on the dispatch arrangement. MIC itself and national government normally don’t dispatch its own personnel to fulfil the gap. However, MIC organizes dispatch scheme. On this MIC scheme, MIC gathers human resource needs in each damaged municipal government through each damaged prefecture. Also, MIC sends cooperation request to municipal governments across Japan and MIC gathers dispatch possibilities and offers from municipal governments through Japan Association of City Mayors and National Association of Towns & Villages. Through such MIC scheme, lots of public servants are identified and dispatched from municipal governments all over Japan (MIC, 2011). The important reasons why this MIC scheme is so powerful and effective are MIC’s national-wide influence and existence of financial incentive. MIC has strong influences to municipal governments in Japan and central government covers human resource costs accrued on this dispatch (MIC, 2012).

Dispatch after Recruitment by Miyagi prefectural government

Miyagi prefectural government conducts advertisement and recruitment activities on behalf of the tsunami-stricken municipal governments. As is mentioned above, though each municipal government does recruitment, because of lack of human resources, it is not enough. So, cooperation of Miyagi prefectural government on recruitment is important. For example, it advertised, employed and dispatched fixed-term public servants on the vocational areas of civil engineer, architecture and compensation works for land owner in 2013. On this recruitment, career open seminars are held not only in Sendai city which is the
capital of Miyagi Prefecture but also in Tokyo too to attract more candidates (Miyagi Prefectural Government, 2013b). Such recruitment would be difficult and costly too if each municipal government conducts separately as its own recruitment activity (Miyagi prefectural government Tokyo office, Mr. Sato).

Other Mechanisms

In addition, though not so many as self-arrangement and MIC scheme, Miyagi prefectural government and other non-tsunami-stricken municipal governments within Miyagi also dispatch their own public servants. Miyagi prefectural government dispatches 44 and non-tsunami-stricken municipal governments dispatches 21 as of 1st March 2014 (Miyagi Prefectural Government, 2014a). The reason why Miyagi prefectural government dispatches personnel even though its workload is much more than before the earthquake and also even though it actually receives lots of dispatches from other prefectures is because the tsunami-stricken municipal governments tend to prefer human resources who know well the damaged locals (Miyagi prefectural government Tokyo office, Mr. Sato).

The Reconstruction Agency is also arranging a scheme to attract human resources from private companies (Reconstruction Agency, 2014). Direct dispatch from private companies to the tsunami-stricken municipal governments, not through the Reconstruction Agency, is also conducted. However, compared to three major dispatch mechanisms, the number of these dispatches is limited on both mechanisms.

SUMMARY

As the result of entire analysis, efforts and mechanisms to fulfil reconstruction engineering capacity including its procurement-related functions and overall administrative human resource capacity in the tsunami-stricken municipal governments in Miyagi prefecture are made clear. Recruitment and dispatch are two ways.

Recruitment by each municipal government is quite limited and especially recruitment of permanent public servants is only an exceptional option as the way to fulfil the human resource gap. Most typical recruitment is fixed-term. In addition, though not so many as fixed-term, there are several other recruitment mechanisms such as recruitment of retired public servants and reappointment.

Interestingly, dispatch is the most effective and well-used way to fulfil the gap. Dispatch number is more than three times of recruitment number in Miyagi 15 tsunami-stricken municipal governments as of 1st March 2014 because these tsunami-stricken municipal governments normally can’t conduct enough recruitment by themselves. Therefore, MIC is taking especially an important role to do so. Through MIC scheme, lots of public servants are dispatched from other prefectures and municipal governments all over Japan. Not only such MIC scheme, but also Miyagi prefectural government conducts advertisement and recruitment activities on behalf of them and then send them to these municipal governments. In addition, Miyagi prefectural government and other non-tsunami-stricken municipal governments within Miyagi prefecture also dispatch their own public servants. As such, most of needs were successfully fulfilled.

Despite these efforts and achieving results, still some shortage of both public servants as a whole and especially engineering officers including procurement-related human resources are remaining. How to fulfil this still remaining gap is a great challenge. In order to more the existing gap, to secure more experienced human resources from the retired public servants, to increase number of reappointments, and also to receive more dispatch from private companies are all important measures.

In addition, how to keep this present fulfilment and national-wide cooperation is also the key. As time and year passes, attention and memory of the damages and difficulties of Tohoku region is still only partly but gradually and surely fading from other regions in Japan and from the world. However, for the smooth and
effective reconstruction and renaissance of Tohoku and Miyagi, to keep receiving human resources for public servants including procurement-related officers are necessary.

As summarized above, experiences, efforts and challenges evoked by the Great East Japan Earthquake about administrative capacity for reconstruction procurement can be a good lessons learnt for preparation and possible effective measures for future wide-area disasters in Japan and in other countries.

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Public Procurement of Homogeneous Goods: the Czech Republic Case Study

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Abstract
The goal of this paper is to show how institutional and procedural characteristics affect the final price of the public procurement. Besides poor data availability, the main problem with PP empirical research possibly lays in variation of procured goods and services, resulting in low comparability of atomic procurement results. We try to overcome this obstacle by examining only a small subset of PP’s, where subject of trade is well-defined, measurable and has solid price benchmarks coming from private markets. These are procurements of electric energy and natural gas. Presented model attempts to explain the variation in unit price as a function of price estimated by the procurer, market price and characteristic of procurement procedure – type of procedure, number of bidders and use of electronic auction.
The dataset covers 250 tenders from 2008 till 2011 worth in total €500 million. We find that the final price in the electricity and natural gas public procurement is more sensitive to procurer’s estimate than to actual market price. At the same time, we identify that the final price is reduced by using open procedure, electronic auction or attracting more competitors.

Introduction
Public procurement (PP) are processed purchases and investments from public sources which consist about 15 % of annual GDP in developed countries (OECD [1]). PP has several very important institutional characteristics that differentiate them from private purchases and which highly affect their overall efficiency.
Despite the enormous importance of the topic, the volume of related empirical literature is quite small. Besides poor data availability, the main problem with PP research possibly lays in variation of procured goods and services, resulting in low comparability of atomic procurement results. We try to overcome this obstacle by examining only a small subset of PP’s, where subject of trade is well-defined, measurable and has solid price benchmarks coming from private markets. These are procurements of electric energy and natural gas. This paper will provide new results relevant for both theoretical discussion and daily practice of PP. Moreover, as the examined legal framework is present not only in the Czech Republic but across the whole European Union, our results should be applicable Europe-wide.
The work is organized as follows: first, we introduce the topic with a literature review. Then we present the motivation of our research together with hypothesis statement. Third, we show an overview of our dataset with a data description where two public procurement markets (electricity and natural gas) are analyzed. Finally, the results of our empirical study are presented, followed by hypotheses discussion and summarizing conclusion.

Literature review
The majority of PP literature describes the process through auction theory. Most papers, such as McAfee and McMillan [2], Bulow and Roberts [3] or Maskin and Riley [4], attempt to set up the optimal or sup-optimal strategies in procurement game with several assumptions given. Laffont and Tirole [5] and Che [6] discuss an optimal procurement process in terms of maximizing expected payoff of a procurer and show that scoring auction provides such property. However, Asker and Cantillon [7] show that scoring auctions are not necessarily optimal
when the bidders’ cost functions are multidimensional. Bulow and Klemperer [8] discuss the pros and cons of competitive bidding (auctions) in comparison to negotiations, showing that under reasonable assumptions and interdependent signals the auction processes do maximize the expected revenues. For the purpose of our research a classical paper by Milgrom and Weber [9] is important: it shows that, for the interdependent values, the expected revenue from an English auction is at least as big as the expected revenue from the first price sealed bid auction. The role of transaction costs in PP procedure was described by Smiley [10], Bajari and Tadelis [11] or Reimarová [12] who estimates the administrative or transaction costs of the procurement procedure in the Czech Republic and evaluates the differences between an in-house administration and an outsourced administration in terms of prices and efficiency.

An empirical analysis by Domberger, et. al. [13] suggest that while competitive bidding reduced the price of PP, the effect of ownership of the procurer (private versus public) on price was negligible (Domberger [13]). Another paper by Bandeira, Prat and Valletti [14] concluded that final prices correlate with types of the procurer: the central administration pays more than semi-autonomous agencies (Bandeira, [14]). Contrary to previously mentioned theories and empirical evidence, Bajari, McMillan and Tadelis [15] show on the dataset of private sector building contracts that auctions may not maximize expected revenues when projects are complex and contractual designs are incomplete (Bajari, [15]). Hattori [16] shows that the amount of bidders in electricity PP in Japan is dependent on characteristics of the purchased good and geographical location.

Motivation & hypotheses

We now attempt to discuss and identify the impact of institutional characteristics on the final price of the procurement. Quantitative research on public procurement usually runs into trouble because of difficulties with any objective metric of success. The provision of public goods typically connected with PP is difficult to measure as PP prices usually lack any benchmark against which they could be compared – in terms of both price and quality. To overcome such difficulty, we limit our research to markets where benchmark for resulting price exists, i.e. to markets with natural gas and electricity. Here we can compare the price of PP purchases against the market price of these commodities. Consequently, this should enable us to measure the effect of various institutional settings on PP result. The market price should serve as sort of lower-bound price benchmark, as majority of suppliers either obtains the energy on the commodity market, or sells it here and therefore any bidder would hardly offer lower price, than they would get on the market. We will use it to examine how chosen procedure and criteria affect the price mark-up, and derive some conclusion regarding efficient behavior. Apparently, our findings will have only limited relevance outside examined markets. Most notably, they do not provide information on PPs where qualitative aspects of offered goods play significant role and the goal of PP is thus different from minimizing price of well-defined good or service.

However, unfortunately even utilities markets are not as homogeneous as we would wish. Although base price for electricity is established on commodity exchange, the final price for consumer (or in case of PP for the procurer) depends on the properties of consumed electricity (voltage level, length of contract, number of phases, distribution assigned rate, daily hour course taking of electricity). Similarly, the final price of gas reflects not only price on the spot market but also the total natural gas offtake, daily reserves and timing of the offtake. Nonetheless, examining these details would not only be tedious, but would also not be very interesting from the economic point of view. At the same time, procurers should account for specific nature of their demand such as offtake time patterns, when producing estimated price, which we use as an explanatory variable. Simultaneously, the estimated price reflects the authority’s willingness to pay – it signals the amount of disposable money that authority budgeted for the procurement.

Nevertheless, when controlling for movements in the market price as well as the estimated price, the characteristics of individual procurement procedure are expected to affect the final price. On the basis of theoretical (e.g.: Bulow and Klemperer [8]) and empirical (e.g. Domberger [13]) literature presented in previous section, we are expecting corresponding results related to the type of procurement procedure: within the open procedure is a most-favorable environment for competition, bidders must shed their bids, pushing the final price as low as possible. On the contrary, the negotiated procedure restricts competition, allowing bidders to bid with an additional mark-up and thus raising the final price.

Similar logic is applicable in the case of number of bidders: theory (e.g.: Bower [17] or Bulow and Klemperer [8]) suggests that gains of increased competition outstrip the potential gains resulting from negotiations. Whereas number of bidders is certainly affected by type of procedure, the competition within certain given procedure can have additional effect – the more bidders involved in bidding process, the lower final price can be reached.

Currently, one of the most discussed tools in PP community is the electronic auction. The electronic auction allows bidders to repetitively adjust offered prices, therefore the competition ends only after no one is willing to bid a lower price. This implements the “English auction” features in a PP environment. According to Milgrom and Weber [9], in the model with interdependent values the expected revenues from an English auction are at least as good as the expected revenue from a first price sealed bid auction – means a basic open procedure (for details see Milgrom [9]). We believe in demonstration of statistically significant negative impact of the e-auction on the final price of procurement of homogeneous goods as well.
As a result of previous empirical evidence (Bandeira [14]) presented in the literature review, we will also test whether there are differences in final prices of tenders purchased by different types of procurers. Their result suggests that the more autonomous the authority is, the greater the concern about unnecessary excess expenses and looking after the final price.

We will also try to deal with the potential endogeneity bias resulting from the omitted variable problem. PP might be subject of a wasteful behavior, which might affect both procedural characteristics (estimated price, type of procedure, number of bidders) and the final price of the procurement. This, unfortunately, would lead to a negative bias of the ordinary least square estimators. To tackle this omitted variable problem, we decided to use a proxy plug-in solution. As a proxy variable for this unobservable wasteful behavior we decided to use a \( zIndex \), a composite index presented by Chvalskovská and Skuhrovec [18] that rates procurers according to quality and transparency of all their procurement competitions over given period of time. The index consists of ten individual ratios representing overall openness, competition or effective controlling processes in purchases of each procurer (see appendix A for individual composites of \( zIndex \)).

In general, the \( zIndex \) measures good practice behavior in public expenditures. Those authorities who follow all good practice guidelines will reach a high level of \( zIndex \). At the same time, the space for wasting public money will be (or, at least, should be) much lower than authorities without such good practices. Therefore the wasteful behavior should be minimized as well. The \( zIndex \) as a good practice measure seems to be a good proxy variable for omitted wasteful behavior that might occur in a PP dataset.

For the purpose of statistical comparison the final price is normalized per unit of purchased commodity. Since we are not much interested in the actual level of the final price but rather in its relative changes caused by other variables, we decided to use a natural logarithm form of the final unit price as a dependent variable. Similarly, both the estimated and the market prices are designed in the natural logarithmic form. During the statistical analysis, the interaction terms will be tested as well.

**Data description**

We had several criteria for choosing examined markets – a sufficient number of PP observations, availability of purchased quantities for unit price computation, homogeneity of good for comparability and availability of market prices time series. We found two commodities that fulfill those requirements:

a) electricity

b) natural gas

The source of the dataset is the Czech national informational portal for PP (www.isvzus.cz), where every large procurement since the year 2006 is listed. As we already mentioned, we are also comparing the final unit price with the market price. We decided to use the Czech electricity and gas market operator (OTE) as a source of the market price. This company provides comprehensive services to individual electricity and gas market players and creates monthly and yearly reports on both markets in the Czech Republic. Since OTE works as a kind of commodity exchange, the unit prices of the commodities are lower than retail prices. OTE price is however the key determinant of retail prices, hence it can be used as a solid bottom-line benchmark. In order to avoid day-to-day volatility on the market, we decide to use the monthly weighted average prices presented in the OTE annual reports.

The dataset covers procurement from 2008 till 2011. The total amount of purchased electricity was over 7 000 GWh and summarized price of these tenders was over 10.5 bn CZK (over 420 mil. €). The gas dataset represents tenders purchasing 2 GWh of gas worth 1.6 bn CZK (64 mil. €). On the following Fig. 1 & Fig. 2 is presented how the tenders and unit prices are scattered over time. The highest and most volatile is the estimated price in both electricity and gas procurement, which might be caused by the heterogeneity of our dataset. On the other hand, the average market price seems to be the smallest and least volatile (especially in the case of gas).
As can be seen on both figures, in most of the observations the estimated unit price is above the final unit price, indicating that the procurers are consistently overestimating the actual price of the procurement.

The following table shows the distribution of various institutional characteristics within the dataset. The dataset covers the 194 competitions that were using open procedure and the 65 tenders processed by negotiated procedures (with or without an announcement). Additionally, in 100 cases the procurer decided to use an electronic auction. The most frequent authorities of both electricity and natural gas procurement are public bodies and regional authorities.

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Total</th>
<th>Open procedure</th>
<th>Negotiated procedure</th>
<th>e-auction</th>
<th>Profit seeking firms</th>
<th>Public bodies</th>
<th>Regional auth.</th>
<th>Central state auth.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>206</td>
<td>157</td>
<td>49</td>
<td>76</td>
<td>14</td>
<td>61</td>
<td>77</td>
<td>54</td>
</tr>
<tr>
<td>Gas</td>
<td>53</td>
<td>37</td>
<td>16</td>
<td>24</td>
<td>10</td>
<td>17</td>
<td>24</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 1: Institutional characteristics of tenders

The supply side of market can be described as oligopoly. We have 13 electricity and 9 gas suppliers in our dataset. Three companies supply more than 77% of the procurement volume in both cases. The Herfindahl index measuring the market concentration equals to 0.25, which indicates high market concentration of suppliers in our dataset.

The important determinant of the outcomes from the procurement procedure is the number of bidders. The number of bidders varies around four (with SD of 1.7), which is similar to the average of the number of bidders in the whole PP market within EU (PWC [19]). The average amounts of bidders for gas is 3.3 (SD 1.6). So both the electricity
and gas PP do not stand out in this characteristic. The comparison of the number of bidders with the amount of players on the whole electricity market is remarkable. As we discussed above, there are only 13 (9 in the case of gas) winners of PP and at least 4 bidders in the tendering procedure in more than 60% of the cases. Therefore, the players must meet and compete with one another on a daily basis. At the same time, more than half of tenders have number of bidders higher than amount of big players on the market, therefore the small players are bidding in these PP as well.

Results and discussion

The results consist of two regressions, each for a given commodity. The regression analysis is based on the standard ordinary least square (OLS) method. The empirical analysis of electricity procurement is based on 206 observations (53 in the case of gas). The coefficient of determination for electricity dataset indicates that 63% of the variation in the log (final price/kWh) is explained by variations in explanatory variables. All three important procedural characteristics seem to be significant determinants of the final price of the commodity procurement, as can be seen in the Table 2.

Additionally, any interaction term was not found statistically significant. Thus, we dare to say that the causalities have linear character. The simple conclusion is, that the procedural characteristics do significantly affect the final price of the electricity PP. Results for gas are weaker; however there is still a statistically significant link between some PP features and the final price. The similarity of results for both markets also suggests that the findings may be in some sense general and have relevance also in other PP markets.

In both cases, the results indicate that the final price elasticity, with respect to the estimated price, tends to be higher than such elasticity with respect to the market price. In other words, the price expectation of procurer does predict final price better than actual market price at the time, when bids are placed. The resulting market elasticity below one suggests high rigidity in the PP market. As the PP procedure usually takes several weeks to process and the contracts are signed for at least one-year, deliveries and the adjustments cannot be as flexible as the commodity market.

As we discussed above in the motivation, the estimated price captures the heterogeneity of the subject of PP, which creates differences in both estimated and final prices. The core reason for analyzing homogeneous goods was to minimize such effect. However, such heterogeneity of the purchased goods should not explain the statistical differences in the procedural characteristics as there is no reason to believe that there is a correlation between differences in purchased good and differences in procedures.

Potential suppliers are bidding on the basis of the willingness to pay of the procurer (equals to estimated price) rather than on the basis of the opportunity costs on the commodity market. However, such ineffectiveness in competition decreases in the case of an electronic auction or in where higher amounts of suppliers are competing for the PP.

The coefficient for the zIndex is insignificant in the model. This good practice indicator is designed as a proxy for wasteful behavior of procurer. The insignificance of the coefficient suggests that this good practice indicator does not provide any new information in the model.

A significant decrease in final until price, 7% on average, is present in the electricity dataset, when the open procedure is applied. Such a drop in final price is caused by the fact that open procedure provides a competitive

<table>
<thead>
<tr>
<th>Dependent variable: log(final price/kWh)</th>
<th>Electricity</th>
<th>Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Explanatory variable</strong></td>
<td><strong>OLS β</strong></td>
<td><strong>Robust SE</strong></td>
</tr>
<tr>
<td>log (estimated price/kWh)</td>
<td>0.64 (0.07) ***</td>
<td></td>
</tr>
<tr>
<td>log (market price/kWh)</td>
<td>0.56 (0.11) ***</td>
<td></td>
</tr>
<tr>
<td>Open procedure</td>
<td>-0.07 (0.02) ***</td>
<td></td>
</tr>
<tr>
<td>electronic auction</td>
<td>-0.06 (0.03) **</td>
<td></td>
</tr>
<tr>
<td>number of bidders</td>
<td>-0.012 (0.006) *</td>
<td></td>
</tr>
<tr>
<td>zIndex</td>
<td>0.05 (0.14)</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>-0.00011 (0.00005) **</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.03 (0.1) **</td>
<td></td>
</tr>
<tr>
<td>R-squared</td>
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<td></td>
</tr>
<tr>
<td>F-test</td>
<td>26.82</td>
<td></td>
</tr>
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</table>

Table 2: Electricity & gas procurement results, note: dropped dummy is negotiated procedure
environment, lowering the final price of PP. Any other type of procedure that restricts the competition causes a statistically significant increase in final price of electricity PP. In the case of gas, the insignificant results may be caused by poor datasets.

The electricity tenders are significantly sensitive to number of bidders: every additional bidder decreases the final price in average by 1%. The gas tenders are even more sensitive, their price drops on average by 4% with an additional bidder. The number of bidders has a positive effect on the competition thus negative effect on the final price. Even though we tested for a potential quadratic form of relationship, the causality seems to be linear. Although we can hardly assume that the same effect would be caused by, for example, a 20th bidder. Nonetheless, within the plausible range, the relationship seems to be straightforward.

With usage of the electronic auction, the final unit price of the electricity PP falls in average by 6%. On average, the gas PP using electronic auctions are 17% cheaper. The enormous difference between the electricity and gas electronic auction is again probably caused by poor dataset of gas PP. However, such dramatic falls in prices are caused by the ability of the electronic auction to allow bidders to adjust offered prices, therefore ending the competition only after no one is willing to bid a lower price. In other words, we have confirmed the theoretical conclusion presented by Milgrom and Weber [9]. On the basis of these findings, utilizing the electronic auctions as frequent as possible seems to be very useful.

The procedural characteristics affect the final price of PP significantly. Procurers can reach a lower price of the PP by bringing a more competitive environment into the procedure. This might be achieved by using an open procedure that allows everyone to bid for the procurement. The procurer cannot choose a number of bidders in the PP, but it might easily encourage or discourage potential bidders by qualification criteria or other barriers to entry. The most effective device seems to be an electronic auction, which might strengthen the competition allowing the bidders adjust their bids. For PP of homogeneous goods, the additional administrative costs of e-auction are negligible (as estimated by Reimaro vac [12] or PWC [19]), but the potential savings are remarkable. Therefore it would be cost-effective to use the open procedure and the electronic auction as often as possible and encouraging as many extra suppliers as possible.

Our results are consistent with the academic literature (e.g. Bower [17], Bulow and Klemperer [8] or Milgrom and Weber [9]) and at the same time, they would be hardly a surprise for PP practitioners, to whom straightforward effect of the electronic auction or the open procedure is anecdotally known. Thus question arises – why do they stick with negotiated procedures, which objectively waste public money? Answer is open to further research, and may consist of their special requirements, corruption or plain rigidity. The PP of homogeneous goods is a relatively small but still remarkable part of public purchases. At the same time, the unique features of PP of homogeneous goods allow us to identify relationships between the institutional setting of the procurement and its final price. Those relationships have been suspected by practitioners and theorists and the main contribution of this paper is its estimation of those relationships and the proof that the more competitive environment of PP is formed, the less will the procurement cost.

Acknowledgements

The research has been supported by GAČR P402/11/0948, Czech grant agency.

References


Appendix A - components of zIndex

<table>
<thead>
<tr>
<th>Openness:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. PP share on total spending on purchases - punishes avoidance of PP (through portioning), or extending contracts beyond their limits.</td>
</tr>
<tr>
<td>2. PP openness - rates according to openness of legal regimes used for PP</td>
</tr>
<tr>
<td>3. Elementary violations of transparency - punishes failure to announce PPs or their price</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Competition:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Winner's concentration - punishes repetitive PP awarding to one or few suppliers</td>
</tr>
<tr>
<td>2. Bidder count - measures average number of firms competing for PP</td>
</tr>
<tr>
<td>3. Deadlines - punishes setting unrealistically close deadlines for placing bids</td>
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</table>

<table>
<thead>
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<th>Accountability:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Legal violations - measures number of erroneous PPs detected by regulatory office</td>
</tr>
<tr>
<td>2. Supplier rating - a supplier transparency measure composed of several sub-indicators</td>
</tr>
<tr>
<td>3. Data quality - counts mistakes in crucial published data (mainly company identification, preventing traceability)</td>
</tr>
<tr>
<td>4. Information provision - measures time and quality of an institution's response to information inquiries</td>
</tr>
</tbody>
</table>

**Table 3**: components of zIndex, source: Chválekovská & Skuhrovec [18]

---

### Appendix B - Extended regression

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Electricity</th>
<th>Gas</th>
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<tr>
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<td>OLS β</td>
<td>Robust SE</td>
</tr>
<tr>
<td>log (estimated price/kWh)</td>
<td>0.66</td>
<td>(0.07) ***</td>
</tr>
<tr>
<td>log (market price/kWh)</td>
<td>0.55</td>
<td>(0.11) ***</td>
</tr>
<tr>
<td>Open procedure</td>
<td>-0.09</td>
<td>(0.03) ***</td>
</tr>
<tr>
<td>electronic auction</td>
<td>-0.08</td>
<td>(0.03) ***</td>
</tr>
<tr>
<td>number of bidders</td>
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<td>(0.007)*</td>
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<td>(0.14)</td>
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<tr>
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<td>-0.00013</td>
<td>(0.00005)**</td>
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<td>F-test</td>
<td>23.20</td>
<td>14.7</td>
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</table>

**Table 4**: Electricity & gas procurement results – including Procurers, note: dropped dummies are negotiated procedure and regional authorities
Electronic Procurement Efficacy Metrics – A Study of Indian Railway Achieved Key Performance Indicators

Pon Sivalingam*

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1. Introduction

1.1 Overview

Indian Railways (IR) is a state-owned 160 years old public utility organization of the Government of India under the Ministry of Railways. As a national common carrier transporting passenger and goods over the country’s length and breadth vast network, Indian Railways has always been playing a key role in India’s social and economic development. It is still cheaper and affordable means of transportation for millions of passengers compared to other modes of transport. As a carrier of bulk freight such as ores and minerals, iron and steel, fuels, cement, mineral oils, food grains and fertilizers, containerized cargo, the importance of Indian Railways for agriculture, industry and the common man is well recognized [1].

Indian Railways is headed by the Cabinet Minister for Railways. The apex body entrusted with the management of this mega enterprise is led by the Chairman Railway Board (CRB). Members of the Railway Board include Financial Commissioner, Member Traffic, Member Engineering, Member Mechanical, Member Electrical and Member Staff who represent their respective functional domains. For administrative purposes, Indian Railways is divided into 17 zones, each headed by a General Manager. Zonal Railways are further divided into smaller operating units called Divisions. There are 68 operating divisions in Indian Railways at present, each headed by Divisional Railway Manager (DRM). In addition, there are a number of Production Units, Training Establishments, Public Sector Enterprises and other Offices working under the control of Railway Board.

Indian Railways (IR) is the third largest railway network in the world with 7,083 railway stations, 131,205 railway bridges, 9,000 locomotives, 51,030 passenger coaches, 219,931 freight cars and 63,974 route kilometers. Today IR operates 19,000 trains each day, comprising 12,000 passenger trains and 7,000 freight trains. It transports 2.65 million tons of freight traffic and 23 million passengers every day and 7.2 billion passengers per year. It currently has 1.36 million employees and an annual revenue base of $18 Billion as projected on March 31, 2012. Indian Railways is also home to great talent and excellent organization focused on operation, efficiency and safety [2]. Indian Railways during the year 2013 joined the select club of countries (China, Russia & USA) transporting one Billion Tons freight traffic in IR.

Over the past, IR has focused its service delivery devoting importance on social responsibility and now, there is an urgent need to enhance capacity and modernize the Indian Railways to meet country’s social and economic aspirations in the 21st Century. With modernization and restoration of balance in the intermodal transport mix, IR can be a significant engine of inclusive growth and development for the country and can potentially contribute an additional 1.5% to 2% to India GDP [2]. To modernize Organization, Management, Development, Finance, Project Management, Research, Procurement, Payment functions deployment of ICT solutions are playing vital role in the recent times in IR.

The IR capital and investment put together constituting $550 Billion earned a profit of just $250 millions (less than 1%) during the year 2011. Indian Railways contributed 1 per cent towards GDP of India at Factor Cost (2004-05 level of prices) during 2010-11 [1].
1.2 Indian Railway Public Procurement

The public procurement (PP) function of the Indian Railways (IR) caters to the material requirement needs of IR’s public rail transport service operation and maintenance and also supports in the manufacture of assets such as rail coaches, locomotives, wagons, wheels, rail equipment, spares required for its transport business. The PP requirements for operation and maintenance are more fluctuating than the asset creation material needs. Zonal Railways and Production Units (PU) run 268 stores Stocking Depots over the railway network for the uninterrupted supply of railway materials and stores. Over 180,000 materials components of various descriptions are stocked in these depots. During 2010-11 the expenditure on materials purchases towards the requirements for operation, maintenance and production etc. (excluding cost of ballast, track related items, materials supplied by contractors for civil construction works) was $5 billion.

Over the last five years Indian Railway Electronic Procurement System (IREPS) and Material Management Information System (MMIS) have been implemented to improve efficiency and transparency in Public Procurement thus reducing the cost of material/purchase due to savings in logistics and transaction cost [1].

Unlike in other Public procurement organizations, wherein the professionals are from commercial background, the IR public procurement professionals are engineers recruited through national level competitive examination. The World Bank while analyzing public procurement in India has remarked regarding IR’s procurement professionals organization as :“the creation of a competitively recruited class one cadre of procurement specialists in the Railways and Department of Supply in the early fifties has contributed to comparatively higher professional standards in both organizations, and needs emulation in other ministries and sectors. Creation of such cadres fosters professional growth, pride in the profession, cross-fertilization of ideas, etc. Alternatively, the professionals belonging to these services should be entrusted with the procurement activity in all ministries [3].

1.3 Evolution of ICT in Indian Railways

Management and governance within evolving network type structures is challenging and emphasizes different skill sets that were not necessarily fundamental in traditional public administration [4]. Technological advancements and the deployment of information communication technology (ICT) supposedly would make government more effective, responsive, and accountable and eventually more democratic [5].

Today we are passing through an era of post-industrial society, which is basically an information society and the economy of today’s society is greatly dependent on the creation, management and distribution of information resources. Thus, in this ever increasing changing scenario, information and information systems (ISs) are valuable organizational resources that must be properly managed for any organization to survive, succeed and grow. ISs are providing the relevant, timely and accurate information so as to help organizations gain strategic advantages over their competitors. The fast development and wide usage of ISs in business have changed the way organizations are managed and thus have made many conventional management approaches obsolete [6].

Now, new organizations are information based. Recently, several approaches have attempted to shape the new information-based strategic framework-research on business process re-engineering. The importance of ISs not only to support operational activities; but also to support strategic decisions. In other words, ISs that do not properly support an organization’s strategic objectives, corporate culture, or user needs can seriously damage the organization’s prospects for survival and success [7].

Indian Railway was one of the first few government departments to introduce computers in the country. Indian Railway Vision 2020 document states that Just-in-time system of material management would be adopted to reduce inventory costs and IT-based MIS and integrated supply management would be adopted to optimize on materials life-cycle costs.

Computerization on Indian Railways started in the year 1963 with the induction of IBM 1401s in the nine zonal railways, three production units, and the Railway Board. Many applications were computerized such as Passenger Revenue and Goods Accounting, Financial Management, Inventory, Operating Statistics etc [8]. While these systems proved to be beneficial to the Railways, they were soon found to be inadequate to cater to the increasing requirements. But it was only in the seventh five year plan period from 1985-1990 these IBM 1401 mainframe computers were replaced with third and fourth generation micro-processor based computer systems. Consequently computerization in the production units and the zonal railways were strengthened, and computers were introduced in the divisions, workshops and stores. Also, many new areas for computerization such as Passenger Reservation System (PRS), Freight Operations Information System (FOIS), and Material Management Information System (MMIS) etc. were initiated. These developments are now beginning to show impacts on both...
the Railway system and its users. During the last five years towards computerization $200 million was allotted in Railway Budget [9].

1.4 Rationale of the Study

The changed scenario of globalization, liberalization and privatization has forced the organizations to pay due attention on the concept and management of ISs. Today, leading companies have started using ISs as tools for staying ahead of competitors. In the process, many organizations have already acquired either a mainframe or personal computers to computerize their ISs. Many more organizations are at the threshold of developing and acquiring these computer systems. It is indeed, a healthy and positive trend but before the organizations decide to acquire larger systems, there is a need to evaluate the planning, controlling and the performance of the already computerized ISs in organizations so that the proposed huge investments in ISs could be utilized effectively and organizations will be able to use information system as weapons of competition. In view of the importance of the subject, it is important to undertake studies to examine planning of ISs in organizations [6].

While the IR has embraced the information technology over last five decades, the proliferation of Personal Computers in last 15 years is providing rich opportunities to IR not only to automate its continuous PP (Public Procurement) functions but also act as a trigger to enable all round system improvements to obtain the value for money spend from the public exchequer. The procurement of goods, works and service contribute more than 50% of its yearly budget in IR [1]. However there is no proper research available on the methodology of the IR’s procurement process, procedures for safeguarding institutional interests or the lacunae and advantages accrued by the systems adopted. Since after commissioning of various ICT projects in IR over the last 15 years, it is worthwhile analyzing the structure, processes and mechanisms and the accrued benefits which have evolved in an organization in existence in a developing country since 1853.

Towards this objective this study is focused to explore the benefits gained by IR in its electronic procurement system and Material Management Information Systems (MMIS) commissioned in IR over the last five years.

2 E-procurement in Indian Railways

2.1 Need for e-procurement

Value for money (VFM) is the core principle governing the public procurement, and is supported by the underpinning principles of efficiency and effectiveness, competition, accountability and transparency, ethics and industry development [10]. Savings from procurement have long been recognized as significant contributors to VFM and to reduce the cost of departments’ operations [11].

ICT provide greater accessibility; facilitate wider multi-communication and dissemination of information; provide automatic record keeping features; and generally enable better knowledge management and information sharing. Further, ICT in government increase productivity [12]. E-Government Procurement (E-GP) is the use of information and communication technology (especially the Internet) by governments in conducting their procurement relationships with suppliers for the acquisition of goods, works, and consultancy services required by the public sector [14].

E-Procurement is the use of electronic technologies to streamline and enable the procurement activities of an organization. It is the term used to define the set of technology solutions which are used to support and enhance purchasing processes such as e-Tendering, e-Auction or Reverse Auction, e-Catalogues, e-Marketplace and e-invoicing. There is confusion to term these e-Procurement solutions. The terms such as ‘forms’, ‘approaches’, ‘modules’, ‘models’ and ‘components’ have been used in the literature to refer to individual applications (tools) of a full (end-to-end) e-Procurement system [15]. Though there is some overlap, each of the e-Procurement tools concentrate on different key areas of procurement sourcing, managing, ordering and paying [16].

In India vision of Nation e-Governance Plan (NeGP), it was the necessity to speed up the implementation of the e-procurement Mission Mode Project (MMP) through rigid intervention in the form of directions from the Ministry of Finance by laying down threshold and timeliness for mandatory adoption of e-procurement system for government procurements. NeGP is working on three tiers architecture in which, Common Service Centres (CSCs) are the front end delivery point, the second tier provides common and support infrastructure in, including in it are, State Wide Area Networks (SWANs) facilitate backbone network for data, voice and video and State Data Centres (SDCs) provides secure IT infrastructure to host state level e-Government application and data. The third tier
comprises of 27 Mission Mode Projects (MMPs). Out of this 27 mission mode projects e-procurement MMP is coming under integrated MMPs. The vision of the e-Procurement MMP is to create a national initiative to implement procurement reforms, through the use of electronic Government procurement, so as to make public procurement in all sectors more transparent and efficient [17].

Indian Railway is the biggest state-owned enterprise and the largest procurer in India. It performs an important function because an efficient transport system is of vital importance to the economic development and social welfare of a country. It performs the fundamental function of stimulating the development of the national economy by transporting goods and passengers at economical/minimum cost. The rail transport industry in India is of utmost importance for the economic development of the country [17].

In IR considering the Government vision and mission in mind, E-procurement was started in the year 2003 as a pilot project and later commissioned across the entire organization. In the year 2009 the project was complete with introduction of all the modules of procurement activities of Railways. The e-procurement solutions were developed by Centre for Railway Information Systems (CRIS), an umbrella organization under Ministry of Railway. Still Railway is in the process of improving the e-procurement systems through integration of the already available systems and with the back end office systems. The sequence of development milestone of e-procurement achievement system is in Figure-1.

Having traced the ICT evolutions and need for e-procurement in Indian railway, the rest of the paper is organized to study the latest developments in e-procurement with particular reference to IR, its implementation performance benefits and the challenges faced in measuring the same. Followed by discussions in comparing such performance benefits to the benchmarks and lastly for the KPI of e-procurement identified from the literature reviews the identified benefits are actually measured from the collected secondary data and comparisons of benefits with reference to earlier manual system is deliberated in the findings of the empirical study.

So, the remainder of this paper shall deliberate seven essentials elements. First, Section 3 reviews literature on prior research regarding development of e-procurement and discusses the performance benefits of e-procurement and the necessity to measure. Second Section 4, brings the benchmarks of Procurement performance laying a baseline to measure the e-procurement efficacy metrics. Section 5, brings the challenges that are faced by the procurement agencies in effectively measuring the e-procurement benefits. Section 6 discusses the study methodology along with data collection approach, identifying some KPI of e-procurement which are measured and compared with the present e-procurement system to the erstwhile manual system performance outcomes. Finally Section 7 discusses the findings of the study of each of the KPI measured through the collected secondary data from the procurement archives and Section 8 concludes with the gist of benefits of e-procurement implemented in IR.

3. Literature Review

3.1 Developments in ICT

Eventually how governments operate, how citizens interact with their governments, as well as what role government plays in society will change. The end result is that government is expected to be more responsive, democratic, accountable and transparent [18]. As a response to the challenge of trade liberalization and globalization, the options available for conducting business electronically will continue to increase. Many developed countries such as United States, Canada and Japan are implementing e-procurement. E-procurement refers to the use of integrated information technology systems for procurement functions, including sourcing, negotiation, ordering, receipt and post-purchased review [19]. In considering the large purchasing power of
governments, e-procurement applied to public procurement presents opportunities for welfare gains that neither the private nor the public sector can afford to ignore [20].

Governments across the globe have spent significant amount of resources (both human and monetary) attempting to digitalize governance (e-governance). A significant number of nations have spent more on information communication technology (ICT) over the last decade than on traditional capital investments such as roadways, airports, water purification plants and the like. Those governments investing heavily in e-governance initiatives anticipate that these efforts will transform governance [14].

One area within government that has seen significant reform efforts, as well as notable investments in ICT is procurement. Those attempting to reform the procurement process argue that the current system is broken, and unsuitable for the demands of modern governance [21]. As a result of various efforts to limit the opportunity for corruption, increase accountability, and promote transparency, procurement has witnessed tremendous pressures to change current processes. In fact, investing in ICT, primarily through e-procurement, has been an attempt to change how government procurement operates. Eventually by adopting digital platforms, procurement would be better suited to achieve the advances of modern government.

Public sector institutions have different objectives towards the implementation of e-Procurement and those cannot be seen simply as extensions of commercial e-Procurement applications because government institutions pursue a wide variety of goals due to their different nature. Within this context the political and legislative environment in which public sector institutions operate calls for conformity to a range of requirements that have little or nothing to do with economic output [22].

Government procurement represents 18.42% of the world GDP [23]. Many countries have created specialized agencies in order to develop and manage business-to-government (B2G) electronic procurement (e-procurement) systems. They have done so to achieve the following objectives [24]:

- Promote the use of Internet across different industries;
- Give signs of transparency, as the transactions between contractors and State agencies become public;
- Reduce administrative cost by improving the procurement process; and
- Reduce purchasing prices, due to a more efficient operation and to a larger number of potential suppliers.

The power of ICTs as a vehicle of communication means that citizens can be more fully involved in all aspects of government, including policy-making, thus reinforcing the creation of a culture of trust and mutual interest. It is argued that that e-governance can provide a climate of honesty, integrity, trust and participation [12].

IR being a government organization has a greater role to play on the socio-economic development of India. Keeping this in view in many passenger transport sectors of IR, though the organization makes loss, it carries the social responsibility to serve the nation in providing affordable passenger transport across the country. Apart from aiming to operate the organization with profit objective, IR has the responsibility of achieving the Indian government mission of connecting every place through rail network to trigger sustained socio-economic development. For fulfilling these objectives modernizing its procurement functions become imperative so that the organization can progress in pace with the demanding expectations of transport industry.

To reduce procurement costs and improve the availability of materials for the smooth functioning of the train system, Indian Railways realized that the procurement system needed streamlining. It needed to be able to better identify the organization’s needs, and to run electronic tenders for contracts to ensure those needs were met. This meant a system that would rank procurement priorities and calculate lead-times and reorder points more accurately. It would also evaluate appropriate suppliers, run tendering processes and monitor contract performance in real-time. Much greater transparency was also needed, to ensure both efficiency and integrity. Indian Railways realized ICT could deliver all this, if it could develop a tailor-made system and get staff and suppliers to embrace it [39].

3.2 E-Procurement Performance Benefits

The overriding objective of a state’s public procurement system is to deliver efficiency and “value for money” in the use of public funds, whilst adhering to national laws and policies. Performance measurement is about seeking to answer the fundamental question of whether the procurement system and operations ultimately deliver in accordance with the main objectives set. Measuring the performance of e-Procurement initiatives has received limited attention in government publications and academic literature [13].

Although the reported benefits and costs of digitizing procurement have been well discussed in the literature, whether proposed transformative goals have been achieved is still being evaluated. The lack of evaluation...
research is a common occurrence for most e-government initiatives and this should be far less surprising when looking specifically at e-procurement initiatives in government. Previous research suggested that simply adopting an e-procurement platform may not achieve its intended purposes [25].

The long-term benefit of the e-procurement system will come from analyzing the information collected in the system over the years of operation to better understand spending patterns, the marketplace and processes applied. Governments need to give consideration to the information required for analytical and reporting requirements and interaction with other system to obtain to most value from the procurement information management system provided by e-procurement practices [13].

There are a number of reported benefits that are regularly associated with the implementation of e-procurement practices. Operational and cost efficiency are perceived as the primary advantage of e-procurement. Scholars assert that employing tools such as e-notice, e-auction, e-catalogue, e-dossier, e-submission and e-signatures will reduce costs and improve buyer-vendor relationships [26]. Web-based purchasing is also believed to offer the capability to develop effective long-term strategic approaches, improve process and budgetary controls, and reduce transaction costs, hence leading to more efficient supply markets [27].

It is reported that e-procurement will facilitate the documentation of the bidding process which would enhance transparency and accountability of government operations. The mechanistic formula-based e-decision making processes used during auctions and bid solicitations is posited to limit discretionary and biased selection, while also increasing transparency and accountability . A fully articulated e-procurement system would expand the bidding pool which, in turn, would eventually enhance the quality of goods or services offered to the government, and most importantly at a lower cost. Increased internal customer satisfaction is also a benefit reportedly associated with e-procurement [27].

There is a strong relationship between the perceived quality and professionalism of implemented e-procurement system; contract and process compliance. Increased use of information communication technologies in the procurement process is expected to lead to more competitive structures and generate competitive markets (expand the vendor pool) that might not have been possible within current manual structures [27].

In theory, e-procurement reduces administrative costs and bureaucracy by helping the State to avoid repeating tasks such as registration and certification of contractors, allowing for more efficient control mechanisms and reducing paperwork. It is found that the electronic reverse auctions (e-RAs) increase productivity and reduce cycle times for buyers, particularly in the case of repeated auctions [28].

Vaidya et al [15] reviewed the literature on e-Procurement performance measurement and presented a list of e-Procurement factors and measures that impact performance. Their investigation revealed Value for Money, customer/supplier satisfaction, system interoperability and integration, change management, quality and transparency of the business process, and management information as the major factors relating to the performance of e-Procurement initiatives. Use of e-Procurement systems also offers increased ability to search for products and services, automated reordering systems, and access to a wider range of service providers [13].

Use of e-procurement system enhances knowledge and confidence in using the system. Greater deployment of systems that provide the most support (i.e. more sophisticated systems with decision-making capabilities), minimize the extent of the "productivity paradox". Similarly, a high professional standard on legislation and administrative framework and a high level of training and information access on suppliers are important to improve the efficiency, competitiveness, and responsiveness of e-procurement [19].

Numerous studies have proven the potentials of e-procurement. E- Procurement facilitates organizations to decentralize their operational procurement processes and centralize strategic procurement processes as a result to provide higher supply chain transparency using e-procurement system. E-procurement used for inter-organization also enhances the benefits of e-procurement within an organization. Companies using e-procurement system reported that they achieve saving up to 42% in purchasing transaction cost allied with less paperwork, which enables transaction processes to less mistake, and more efficient purchasing. Paper-based procurement process implies transaction costs range from $70 to $300 per purchase order [29].

Implementation of e-procurement initiatives and structures could improve the professionalism and outside perceptions of procurement specialists [27]. The latter would provide the context for procurement professionals to become more involved in shaping public policy. As a result, the procurement process of governments would not only be more responsive, but eventually governance could be better situated at a policy level to take advantage of innovations in the market place [27].
It can be said that the ease of use, system availability and user friendliness together can contribute to positive user satisfaction. Management information that can be extracted from the e-Procurement system improves transparency, employee accountability, compliance, monitoring and supplier performance measurement, which in turn, contribute to value for money improvement. It is obvious that e-Procurement greatly helps to improve communication with suppliers providing access to the latest information 24 hours a day, 7 days a week. Thus the maximum systems availability makes it easier for businesses to obtain tender documentation and to submit an offer. The general ease of information flow afforded by the internet can help overcome many of the problems of geographic isolation which can promote competition [13].

When e-procurement is implemented in public procurement, several benefits generated accrue to different stakeholders who are adopting the processes. The benefits to these interlinked stakeholders on an overall enhance the procurement performance and effectiveness of the public procurement function all round. The main stakeholders in any public procurement are the organization that embraces, the customers to which the procurement entity is serving, the suppliers who perform like a partner in efficient supply chain and finally the citizen whose money is spent in public procurement. On the basis of preceding sections deliberations, the e-procurement benefits are grouped under following four categories:-

- **Economy towards value for money (VFM)**
- **Procurement Efficiency & Effectiveness**
- **PP Ethics and Transparency**
- **Competitive Markets**

Under each of the categories, the benefits realized by each of the stakeholders are shown below in following section tables. These various benefits lays a foundation to the organization to evolve methodologies to embed a continuous procurement performance measurement mechanisms in the e-procurement system to access, analyze the dynamically changing e-procurement benefits with reference to the bench marks fixed by the organization for each of the procurement activity and to take further remedial action wherever any corrections are required.

### Economy towards value for money (VFM)

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<td>Administration cost savings in improving the processes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Efficient competition resulting reduction in purchase price</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Optimized inventory management</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Savings in operating and inventory carrying costs</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Scope for negotiated unit cost reduction</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Improved knowledge and confidence among stakeholders</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Operational procurement decentralization</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Strategic procurement centralization</td>
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<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Reduction in ordering costs</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Efficient budget controls and expenditure monitoring</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
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<td>Savings in tender documents distribution</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
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<tr>
<td>Savings in cost of receiving the bids manually</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
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<tr>
<td>Savings in print, copy _collate ,postage actions</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Reduction in Total cost of ownership of PP entity</td>
<td>Yes</td>
<td></td>
<td></td>
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<tr>
<td>Online access to tender documents</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
<td></td>
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<td>Online payment of bid cost/security</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
<td></td>
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<td>Elimination of reliance on postal/courier services</td>
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<td></td>
<td>Yes</td>
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<tr>
<td>Reduced total cost of procurement</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Reduction in advertisement and tendering costs</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
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<tr>
<td>Lead-time optimization</td>
<td>Yes</td>
<td>Yes</td>
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Table 1

7
<table>
<thead>
<tr>
<th>Benefit</th>
<th>Organization</th>
<th>Supplier</th>
<th>Customers</th>
<th>Public</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elimination of tasks repetition and duplication</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Efficient contract monitoring mechanism</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduction in paperwork</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Satisfaction among suppliers and customers</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>System interoperability and integration</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Decision supporting information systems</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
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<td>Contract compliance improvements</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Lesser mistakes in transaction processes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Procurement specialists’ improved professionalism</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Evaluation tools to assist management</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control over tender evaluation process</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Storage and archiving documentation for future use</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Management of tender deadlines</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Improved audit trail</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Real-time financial data availability advantages</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Operational decentralization and strategic centralization of purchase</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Lead-time optimization</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Organization</th>
<th>Supplier</th>
<th>Customers</th>
<th>Public</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethics of transparency fair play visibility</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clear visibility of customer demand throughout</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Online information exchange among stakeholders</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Market transparency</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Control over discretionary and biased contract award</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Customer satisfaction</td>
<td>Yes</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Round the Clock access to information</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Employee accountability</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Accountability for each activity</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Online information exchange among stakeholders</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Speed and ease of response to supplier's queries</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Reduction in complaints/challenges/suspended process</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Lead-time optimization</td>
<td>Yes</td>
<td>Yes</td>
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</tbody>
</table>
### Competitive Markets

#### Table 4

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Organization</th>
<th>Supplier</th>
<th>Customers</th>
<th>Public</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to broader vendor base for better procurement</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meaningful buyer-supplier relationships</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Efficient supply base and markets</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Enhanced quality and services of broader vendor base</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Buyer supplier interaction and feedback</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development of new suppliers</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
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</table>

#### Procurement Cycle Time

#### Table 5

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Organization</th>
<th>Supplier</th>
<th>Customers</th>
<th>Public</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction in procurement cycle times to buyer</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Automated reordering systems</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Standardization of procurement processes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Reduction in order fulfillment time</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Reduction in bid validity from vendor due to faster contract awards</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Lead-time optimization</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

### 4. Benchmarks in Procurement Performance

Public sector e-procurement is a complex socio-technical system embedded in multiple layers of government. It has the capacity to become a meaningful agent of transformation in procurement practices through the joint actions of different layers of government and cooperation across diverse agencies [30]

ISs of any worth must be adequately planned for. The planning activity must be undertaken on a regular basis. ISs must be made a part of the organizational plan so that a proper match between the business and ISs plan can be achieved. A supportive attitude of the department management and of the department staff in IS project planning can contribute only in the presence of strong leadership. Hence, it is the collaborative role of all the heads as well as of the staff, which should be strived for [6].

The rationale of procurement benchmarking is to research and identify best practices that have proven to be successful in particular areas and which have the potential for improving other similar practices and or performances. Benchmarking VFM can often be very difficult. VFM is a very broad concept encompassing a range of factors, and it is very important to understand the implications it has for the public sector. Although VFM criteria often seem self explanatory, benchmarking VFM can be difficult where the subject matter is technically complex, requiring sophisticated understanding and there is no universally accepted methodology to follow [31].

Benchmarking and performance measurement are the main techniques that have been used by many leading researchers and practitioners on improving both private and public sector organizations [31]. As a practice within the public sector, benchmarking implies a systematic measurement and comparison of the activities of individuals and organizations with a view to improving their efficiency and quality. Benchmarking maybe distinguished from other traditional forms of evaluation by its attempt to visualize best practice through normalizing comparison and by urging public entities to ask themselves what they can do to promote best practices [32].

The rationale of procurement benchmarking therefore will be to research and identify best practices that have proven to be successful in particular areas and which have the potential for improving other similar practices and or performances [31].

Public sector procurement is more regulated than private sector procurement, and there are more rules to comply with, more policy considerations to take into account. Government agencies are very bureaucratic in nature
and are extremely reluctant to change their current habits and practices. Even those public bodies that genuinely wish to change are restricted by standing orders, public accountability, and probity constraints. It is argued that public sector agencies need to incorporate most of the modern management tools and technologies to cope with the procurement industry, to remain competitive and make maximum use of scarce resources [33].

Benchmarking enables and motivates one to determine how well one’s current practices compare to others, experience best practices in action, locate performance gaps, prioritize opportunities and areas for improvement, and improve current levels to world class standards. Benchmarking is not the same as benchmarks; benchmarks are performance measures [33]. The service and public sectors are also keen to embrace performance measurement. The importance of benchmarking in the achievement of better results in public procurement and in overall business performance has been widely asserted in literature. We do not need to measure everything that matters; we only need to measure the things that matter [31].

The need to benchmark and measure performance in public sector organizations is becoming more intense. Procurement benchmarking therefore is the effort to measure performance of a supplier of goods or services on the basis of quality price and timely delivery. Another benchmark in the public sector is the customer-supplier satisfaction as measured by the number of complaints received [34].

We cannot simply adopt a best practice and implant it in the organization but that one may have to look at the way things are being done, such as the prevailing culture and human resources employed to do the job before one can adopt a benchmarking practice [35]. Process benchmarking and internal benchmarking would be both important when a comparison of techniques is undertaken. Process benchmarking is when methods and processes are compared in an effort to improve the processes in one’s own organization. Internal benchmarking is when comparisons are made between departments or divisions of the same organization. Internal assessment contributed to the attainment of benefits of benchmarking by focusing on the culture, training and internal communication within the organization. Thus, in the last ten years, different types of benchmarking have been used as a common management practice in purchasing departments, in both developed and developing countries [31].

Benchmarking that involves the comparative study or analyses of successful procurement systems of all or a number of contracting authorities can be an excellent method of assisting with the definition of performance targets. Benchmarking data may also be made available nationally to ensure the use of a uniform performance measurement system throughout the country, which may also facilitate comparisons at a national level. Benchmarking is also a method by which a contracting authority may compare its own operations in various aspects with comparable external undertakings, such as a similar contracting authority known for its excellence. Benchmarking can also be used for various other comparisons, such as prices or service levels [31].

<table>
<thead>
<tr>
<th>Activity</th>
<th>Target (in days)</th>
<th>Actual Dates From - To</th>
<th>Days Taken</th>
<th>Deviation (+/-)</th>
<th>Reason for excess time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration of demand and advising demand No.</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indent scrutiny and consolidation of all demands</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Quantity Approval by the Procurement Authority</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vetting of procurable quantity by Finance</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procurement proposal and approval of bidding</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bid schedule preparation with samples/drawings</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Release of notice inviting bids</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bid opening period after issue of bid notice</td>
<td>45</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Making of commercial tabulation after bid open</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Checking &amp; vetting tabulation by Finance officer</td>
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<tr>
<td>Technical evaluation by the Technical authority</td>
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<td></td>
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<tr>
<td>Finalization of tender by the Evaluation committee</td>
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<tr>
<td>Contract award acceptance by the Authority</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issue of letter of acceptance and counter offers</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Draft contract award preparation for concurrence</td>
<td>3</td>
<td></td>
<td></td>
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<tr>
<td>Contract award concurrence by finance branch</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purchase Order numbering and dispatching to all</td>
<td>5</td>
<td></td>
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<tr>
<td>Contingency buffer time allowed</td>
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<tr>
<td>TOTAL</td>
<td>172 days</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Source: Southern Railway intranet site https://10.5.2.32
While measuring the procurement performance, it is necessary to rely on some base indicators for comparisons and to attempt improvement continuously. Government has fixed targets or milestones in each of its procurement functions to measure the efficiency. IR in the procurement cycle from the demand generation to the post contract compliance activities like refund of bid security back to the supplier, compilation of contract completion and performance details etc, the organization has fixed benchmarks and IR analyze them continuously for effective monitoring to achieve the targets.

In the public open bidding process IR has fixed bench marks in the year 2003 at a time when ICT were fully functional for its Decision Supporting systems (DSS) of procurement. The objectives were to achieve visibility, accountability and observe and analyze the reasons for ineffectiveness to take remedial action besides continuously improving the efficiency. The Table 6 above shows the details of bench marks fixed by IR for each of its activity in procurement. For easy facilitation of recording the progress of each activity the table was printed on one side of procurement file, so that after dealt by the stakeholders, the time taken by them are recorded. After contract award, the cases which have deviation in excess of 5% tolerance are reviewed by the Procurement auditing to identify the problems.

5. Challenges in Performance measurement

Developing and implementing an e-procurement system can be difficult and complex. An effective and efficient system incorporates appropriate tools and procedures that support technical, business and work practice requirements. It also integrates with buyer agency systems (i.e., FMIS / ERP) and supplier systems. This integration will ensure all participants have access to the data required to complete the transaction. In many examples, the diverse technical requirements of different agencies were underestimated, and technical delays eroded the value proposition to those buyers. The technology used in public e-procurement systems needs to be aligned with industry standards. This can be difficult with the lack of agreed standards in the industry. The lack of standards and evolving classification systems around catalogues, suppliers and cost codes created difficulties in achieving interoperability across and within government [30].

Increasing the effectiveness, efficiency and transparency of public procurement systems has become an ongoing concern of governments and of the international development community. Performance measurement is viewed as a warning, diagnosis and control system, that is used to keep track of economy (looking back), efficiency (current organizational process), effectiveness (output in the short term) and efficacy (output in the long term)[13].

There are several barriers in implementing e-procurement successfully and the organizations faces challenges in measuring its performance metrics. While it is easy to measure the reduction in procurement cycle time in e-procurement scenario, it is a difficult task to measure the level of confidence built among the stakeholder or the change in supplier/customer relationships/satisfaction.

The implementation of e-procurement can often be costly, especially in cases when systems based on incompatible platforms are attempted to be incorporated at a later date. The more diverse the technical platforms the more prohibitive it becomes. Fulfilling the legislative requirements for transparency and timely provision of information increases by notable margins the operational cost of e-procurement [27].

The management and monitoring of e-procurement systems will emphasize different skill sets and relationship constructs that have not been witnessed in traditional public procurement practices. It could be argued that e-procurement might stymie the development of trust within the relationships between procurement specialists and vendors. While information communication technology can limit human-induced biases it can also strip the public sector of the benefit of reduced administrative costs that result from trust-based working relationships among members of networks [26].

The complexities and risks involved in e-procurement activities are frequently misunderstood and the seeds of failure often shown with the presumption that technology per se rather than management and culture are the key. In this situation security and trustworthiness are the paramount active concerns preventing the wider adoption of e-procurement strategies. Fears over security are no less significant amongst those companies that already have substantial experience of e-procurement. Indeed, the more companies know about e-procurement, the more scared they are about security. All these needs e-procurement systems be introduced in organization effectively to obtain all round benefits [38].
Challenges faced in e-Procurement Performance measurement

<table>
<thead>
<tr>
<th>Measuring benefit</th>
<th>Challenge faced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Cashable savings</td>
<td>For fixed specification/price items arriving savings in comparison to previous period</td>
</tr>
<tr>
<td>Individual price analysis</td>
<td>Under frequent fluctuations calculating the change by indexing inflations/price indices</td>
</tr>
<tr>
<td>Savings in procurement due to efficiencies</td>
<td>Savings during a period in terms of resources, benefits calculation through input output analysis</td>
</tr>
<tr>
<td>Procurement function and Procedures quality</td>
<td>Measuring target metrics such as time to complete an activity, cost, % of restricted/negotiated tenders/prices</td>
</tr>
<tr>
<td>Contract implementation efficiency</td>
<td>Cost savings, achieving implementation deadlines, milestones, Return on investment on capital</td>
</tr>
<tr>
<td>Internal and external collaborations/relations</td>
<td>Supplier and internal customers/clients satisfaction levels towards collaboration and service levels respectively</td>
</tr>
<tr>
<td>E-procurement as a competing priority</td>
<td>Maintaining e-procurement among other priorities of the organization/ Government</td>
</tr>
<tr>
<td>All stakeholder adoption of system</td>
<td>Supporting internal customers and suppliers to facilitate in adoption / training till full implementation</td>
</tr>
<tr>
<td>Conflict with already working information systems</td>
<td>Integrating with other Management information systems in the organization like ERP, MMIS</td>
</tr>
<tr>
<td>Developing skilled resources</td>
<td>Building multifunctional teams to address end to end solutions</td>
</tr>
<tr>
<td>Managing Authenticity and security</td>
<td>Creating and maintaining an effective information security process/policies in the silo type government set-up</td>
</tr>
<tr>
<td>Top level Management support</td>
<td>Vision and mandate of the top level management to achieve the milestones till full implementation</td>
</tr>
<tr>
<td>Budget constraints</td>
<td>Organization priority to allot sufficient funds for time bound implementation</td>
</tr>
<tr>
<td>Resistance to change</td>
<td>Adaptation of new procedures by the stakeholders</td>
</tr>
<tr>
<td>Re-engineering the old processes</td>
<td>Obliterating, modifying, and introducing new process for adaption by stake holders</td>
</tr>
<tr>
<td>Consistent policy goals and objectives</td>
<td>Are critical as inconsistent systems are meaningless acting as constrain to maximize economic efficiency</td>
</tr>
<tr>
<td>Accurate and reliable statistical information</td>
<td>Collection of good quality, relevant and appropriate data in a robust and consistent manner for practical use.</td>
</tr>
<tr>
<td>Defining and measuring efficiency</td>
<td>Difficulty in defining efficiency, measuring it and applying across consistently</td>
</tr>
<tr>
<td>Adopting performance driven culture in organization</td>
<td>Regulatory and institutional mechanisms offer rare incentives to strive for improved efficiency</td>
</tr>
<tr>
<td>Setting performance targets relevant to achieve</td>
<td>Well defined, timely, reliable, comparable and verifiable targets in day to day working</td>
</tr>
</tbody>
</table>

However, the challenge of measuring the performance of e-Procurement initiatives has received limited attention in government publications and academic literature. An organization’s e-Procurement objectives and performance measures are grouped into four perspectives: Financial, Customer, Internal Business Process and Learning-and-Growth [13].

In order to address the challenges in measuring the performance, it is worth to analyze them first, so that whether the deployed performance measurement systems delivers effective results can be checked. Some of the challenges analyzed are in Table 7 [30].

Furthermore, good measurement systems with appropriate benchmarks are important components of any reform program to identify potential areas for enhancement. Most measures are lagging indicators (outcomes oriented) rather than leading indicators (outputs oriented). While measuring only the financial approach may be suitable for private sector as profit is, arguably, the predominant goal, the same single-focused approach cannot be applied as the only measure for the public sector. A more balanced measure of the benefits and progress of an e-Procurement initiative are necessary. This will enable a public sector organization to ensure that e- procurement strategy implementation objectives are being fulfilled and support the broader objectives of government agencies in terms of their requirements for transparency, accountability and probity [37]. The reform solutions within
government procurement systems must include measures that address issues of accountability, transparency, value for money, a professional work force and ethics [31].

6. Study Methodology

6.1 Data Collection Approach

IR has been benefitting on several fronts in e-procurement implementation that has been enumerated in the preceding literature survey. However considering the challenges in measuring all the performance benefits due to non-availability of structured secondary data in the archives, only some KPI, which covers few of the major aspects of effectiveness were identified and taken up for comparative measurement between manual procurement and the later e-procurement performances.

Over the last 15 years IR after introduction of Personal computing systems has been capturing procurement data and in the last five years on introduction of e-procurement and MMIS, the data is archived. Since the IR is not adopting a continuous performance measurement program in respect of its ICT outcome, the data captured was voluminous and not structured to reflect/analyze the benefits/ comparisons of e-procurement over the first five years and later five years. Hence the captured data is voluminous and has to be structured to study the performance factors identified for measurement.

Though there are 17 zonal railways and 6 production units carrying procurement, only half of these procurement authorities have been deploying information systems prior to e-procurement implementation. So the sample data collected and analyzed in this exploratory research pertains to authorities which have been using the information systems in different platforms over 15 years internally.

6.2 Study Objective

The study question/objectives are: What are the benefits of implementing of e-procurement in IR? How it can be measured? How much benefits with reference to manual procurement systems?

The data available can answer the above questions and has relevance to the organization, time and are measureable. The collected data was structured, verified and formatted to meet the research objective of measuring the identified performance indicators. Among 180,000 different items available in IR only items used specifically by IR were selected, which constitutes a monopolistic market. Among such of 900 items, random samples of 150 items were selected for study. As the sample of 150 items can meet the statistical requirements of study, the data was compiled comparing the metrics pertaining to manual procurement vis-à-vis the e-procurement over a period of 10 years.

The items selected are procured by most of the PP agencies across many zonal railways and hence inter-se comparisons are feasible. For the selected 150 items, the data was compiled comparing the metrics pertaining to manual procurement vis-à-vis the e-procurement for the KPI to be studied. For 150 items the total number open tender procurement analyzed under three different zonal railways is 1200 over 10 year period which is a considerable sample size. From the collected data the outliers like proprietary contract procurement, restricted emergency procurement were removed (the time required is less and methodology followed in these bidding method is different), so that the data represents homogeneous open contracting tenders only. The data was coded and formatted according to the KPI to be studied, checked for validity and reliability. The whole of the data was retrieved through organization intranet. For parameters which are not captured in the database like number of pages in the procurement office file, advertisement cost etc individual documents, files, archives were accessed from the organization for study and the data collected.

In the process of IR public procurement function, the organization continues to study the each activity effort and time required to be taken through work studies. After work study, IR has fixed targets for each of the activity from generation of purchase demand to disbursement of payment to the supplier. The PP office has earlier a decade back when e-procurement systems were not in place has introduced benchmarks for each of the procurement activity and have been recording the time and effort taken continuously in the procurement file. Where there were deviations the reasons for the same were also captured for analyze and taking remedial action if any is required. So these act as benchmarks on which both the erstwhile system performance can be measured and also e-procurement performance metrics.

7. Empirical Results and Analysis

To limit the performance metrics only to the extent of KPI of procurement efficacy and effectiveness among the benefits identified on e-procurement, only some of the KPI were taken up for study from the secondary
The KPI measured is in the reduction in times from each of procurement activity with reference to the benchmark time fixed by IR. The extent of savings in paper work, back and forth file movements, tasks duplication, economy factors like savings in bidding advertisement cost, reduction in rates. Further the efficiency indicators like availability of items for IR operation, inventory turnover ratios etc were measured and compared with the present e-procurement regimen to earlier manual procurement adopted period. It is obvious that apart from these benefits IR has also benefits in most of the e-procurement benefits due to be achieved through ICT. However to measure all the benefits the archived data is not structured and further the time taken to measure all the e-procurement benefits is enormous.

The KPI identified for measurement are grouped into the following categories of benefits and discussed below.

- Procurement Cycle time
- Economy towards Value for money
- Procurement Efficiency and Effectiveness
- Competitive Markets

7.1 Re-engineered procurement planning time

Prior to e-procurement systems introduction, for the entire IR organization, a single mainframe computer system meant for all information needs and transactions processing was available including to cater to the information needs of Material Management. The whole organization databases were kept in the Headquarters EDP in magnetic tapes since 1965 for each of the Zonal Railway isolating from the procurement office, the warehouse, user department and supplier. This has created several information gaps in effectively conducting the procurement.

For each item in IR, the procurement planning starts 18 months prior to the expected contract delivery date. The procurement cycle is managed in IR is through fixed period model of one year. For convenience and to distribute the whole procurement work equally throughout the year each item is marked with a date on which a draft procurement demand is generated. Two months in advance to this key date, from the mainframe computer data centre on first week of every month, an advance intimation of all items pertaining to next month is generated. This computer printout reflecting with outstanding old demands and pending contracts are sent to the warehouses, where these items are stocked for distribution to the end users of the IR network.

The warehouse on receipt of this advance intimation, two months prior to the demand generation date, checks its office records to verify and validate each of the printed information in the intimation and submits back to the EDP centre in next 30 days. Thereafter in the EDP centre on updation of the demand information in computer, generate a final draft demand for the next procurement period. After introduction of e-procurement and MMIS systems, this 60 days procurement planning time is eliminated. As the entire information is real-time online, for any validation, the warehouse accesses it and completes online. For this the procurement office, warehouse, finance branch, EDP centre is integrated though internet and intranet. The efficacy metrics in time saved of these activities is brought out in the following table 8

### Procurement Processes Cycle time comparisons in e- procurement

<table>
<thead>
<tr>
<th>Activity</th>
<th>Manual Procurement system *</th>
<th>Time taken in days</th>
<th>Modified activity in e-procurement</th>
<th>Average measured time</th>
<th>Savings in paper (A4 size)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Draft demand advance intimation</td>
<td>EDP Centre</td>
<td>30 days</td>
<td>25 to 40 days</td>
<td>Online daily alerts to warehouse for validation and verification if any for modification</td>
<td>3 days 12 pages</td>
</tr>
<tr>
<td>Demand scrutiny and budget vetting</td>
<td>Warehous e</td>
<td>30 days</td>
<td>30 to 35 days</td>
<td>Error checks, forward to Finance and budget clearance</td>
<td>7 days 18 pages</td>
</tr>
<tr>
<td>Procureable Quantity calculation</td>
<td>PP office</td>
<td>15 days</td>
<td>30 days</td>
<td>Demand examination with sanctioned quantity already available in the system and deciding the quantity procurable</td>
<td>15 days 16 pages</td>
</tr>
<tr>
<td>Demand approval for procurement</td>
<td>PP officer</td>
<td>5 days</td>
<td>7 days</td>
<td>Online updation of description and specification by user with email/SMS alerts</td>
<td>15 days 16 pages</td>
</tr>
<tr>
<td>Description/ specification update</td>
<td>End user</td>
<td>7 days</td>
<td>15 days</td>
<td>Online bid documents uploading and email and SMS alerts to probable bidders</td>
<td>30 days 250 pages</td>
</tr>
</tbody>
</table>

*Source: Southern Railway intranet site [https://10.5.2.32](https://10.5.2.32)*
In addition to the 60 days saved in planning, the demand is generated online and after budget clearance the documents flow manually to the procurement office within a week time instead of normal 30 days in the erstwhile systems. On getting a valid demand for the item in older days, a trend analysis of items was made in procurement office by comparing the past consumption, change in activities, justification for the demanded quantity etc. This process is eliminated by way of computer intelligent decision supporting systems suggesting the time and quantity to be procured for the next demand cycle period. The paper files moving at different levels are modified to online interactions and approvals, thereby another 30 days time is saved.

As an item specification could be modified continuously, an access is given to the end user, who updates the latest description/specifications including uploading the specifications and drawings softcopies for bid invitation purpose. All put together saved IR 10 months time of procurement cycle time from the earlier 18 months cycle time. Once the integration of back end office systems is implemented the efficacy could be improved further.

7.2 Bid Invitation

In the conventional system once the mode of tender, either restricted or open contracting tender is decided, an NIT (Notice Inviting Tender) is sent to Public Relations department, wherefrom the matter is sent for various publications for a wider publicity among the vendor fraternity. To maintain the PP ethics and rules compliance only a monthly update of tenders are uploaded in the e-procurement portal, are sent to publication, thereby reducing the time to the extent 30 days (maximum). The system apart from saving the documentation and paperwork also generates email/SMS alerts automatically for the interested vendors who are either registered for these items in Railway or participated earlier in the tender floated for the items. The whole process of initiating of NIT to fixing the bid opening dates took 90 days earlier has been reduced to 30 days now.

7.3 Bid Opening

To comply with the transparency ethics, on the date of bid opening, an elaborate arrangement have to be made to open the bid, verify, document, sort-out item wise and read them in presence of vendors who have participated in the bid invitation. This activity took atleast 30-60 minutes for each item depending upon the nature of the item and number of vendors participated in the tender. Now on elimination of this process, after bids are electronically opened on the specified time, all the vendors, who have participated in the tender, can access a comparative commercial tabulation statement to compare with other bidders offers. In the manual bid opening many times bids were received late after bid opening time. These bids are treated as late bids and are not included in the evaluation. In the e-procurement tender opening the concept of late bids are totally eliminated as the bidder cannot submit any offer after bidding time closure.

7.4 Contract award

In the old manual system, a laborious process of tabulating all the offers manually and writing them in a printed form had to be completed, a methodology besides fraught with errors warranting checking mechanisms, involved 5-7 days. As commercial tabulation is made automatic in e-procurement portal after opening of the e-tender through procurement office authorized person’s digital signature and encryption keys all the stakeholders of the tender can access the bid details at once including the Technical and Commercial evaluation committees. These improvements make the contract award within a month in comparison to 90 days earlier.

On bid opening in the erstwhile methods, as all the bid papers submitted by the vendor is kept as received condition in the file. The evaluation and contract awarding authorities had to search for several commercial and technical details from every bid paper submitted, which not only laborious but lead to errors and disputes later. Due to this the bid finalization for evaluation to the authorities took extra 15 days. In case of capital equipment procurement tenders, the bidders are specifically asked to commit a bid validity period of 120 days in comparison to other open contracting validity of 90 days. But now the technical parameters matrix is uploaded in the e-portal asking compliance remarks of each of the parameter from the bidders during the online bidding, thereby compilation of such technical evaluation after tender opening is not required.

7.5 Delivery period and lead-time

An analyze of the collected date reveals that the delivery time i.e. the time lag between contract award date to actual delivery of the item at the warehouse improved atleast by 50% in each case on an average as the time period of communication by postal/courier is eliminated. Once the contract award is signed digitally by the contracting officer, the same at once reaches the successful bidder by mail. By introduction of payment gateways, payments from the bidders like bid fee, earnest money, security deposits etc are paid through payment gateways online. Even after contract award, post contract documents like road permits, contract modifications, octroi
exemptions, entry tax etc are dealt online. All these system correction led the vendors to offer lesser delivery period.

Earlier it was a mandatory condition that each bidder has to agree for a bid validity of atleast 90days after bids are opened, due to the reason that the contract award finalization took atleast 90 days. Due to this it was common for the bidders to load a risk cost of escalation that may arise during this 90days bid validity period. As now tenders are finalized within a month, the bidders confidence is enhanced thereby a margin reduction in the offered rates is possible with better competition. Another reason that could be attributed to savings in rates is faster acceptance of supplies by consignees and online electronic payment. For each month delay the supplier looses at least 1% of contract value by way of interest on their locked up money which is now passed on to the purchaser.

7.6 Payment Time

In the course of procurement processes, while the bidder is involved in payment procedures like paying bid documents cost, Drawings/specification costs, Earnest money deposit, contract securities and performance guarantees, the purchaser has to refund the bid fee if bidding is cancelled, return the EMD to all un-successful bidders, refund the security deposit after contract completion and return the bank performance guarantee after the warranty/guaranty periods besides paying for supplies made by the vendor.

In earlier days, the bidder, to purchase bid documents, has to visit the procurement office to pay the cost or has to send the payment through mail/courier. Taking into consideration of several delays, the bid opening is fixed either for a longer period or postponed sometimes due to process delays/complaints. In the initial stage of e-procurement, IR was allowing the bidders to download the bid documents online with the condition that the bid cost has to be paid by the bidder by sending the bank draft before the bid opening. This again resulted in difficulties in watching every bidder payment. Later IR collaborated with the government bankers and opened the payment gateway for electronic fund transfers by bidder to IR bank account. This facility of online payment gateway is also extended to earnst money payment by bidders. As security deposit and performance guarantee payment is meant for only the successful bidders before the contract award, still IR is receiving the same manually but it is included in the integration of its back office systems to deal like other payments.

In the revised process both bidder and purchaser saves time and resources. In PP the time lag between goods delivery to payment receipt by the supplier is an input for the bidder to decide the final bidding cost as the supplier has to factor- in the interest amount involved on their locked up capital with the purchaser for the delays in payment disbursement. This in turn affects purchaser-supplier relationships resulting disputes as well sometimes.

Earlier in the manual systems, the supplier after delivery of goods to the consignee has to wait at least one month for release of their goods acceptance document to lodge their bills with the IR Finance branch. During this period in the warehouse, the item is accounted, inspected in the labs and finally taken into the books duly releasing the goods receipt note to the supplier. Even after submitting the bills by the supplier, about 15 days time is involved in passing their bills, preparation of cheques and dispatching them to supplier and then remitting them in the back for clearance. This takes another 15 days time and virtually the supplier gets the money only after 2 months.

In the present scenario after introduction of certain system corrections, the payment process is expedited. First the inspection process after receipt of goods is eliminated except the quantity checks and visual checks, by introducing the inspection process in the supplier premises itself before the goods are dispatched. Once the pre-inspection is completed the goods are delivered to the consignee with inspection certificate. In the warehouse only the quantity is checked and the invoice is certified for the quantity received. The supplier on the next day submits the bills and in a couple of days receives the payment through electronic fund transfer to supplier bank account. Now the paying authority is able to see the online authenticated contract, consignee acceptance of supplies online and matches the same with supplier bills for passing payment. In this process as atleast 1% interest is saved for the one month speedier payment process and if the suppliers pass on this savings to the purchaser thorough 1% reduction in quoted price, the IR could save $500 million per year for the yearly material procurement value of $5 Billion.

7.7 Economy towards Value for money (VFM)

Due to inflation each items bid rates will continue to rise year after year procurement cycles. The objective of open contracting in PP is to get VFM through competition. For every contract award, IR analyses the rate reasonability with reference the previous purchase rates. For these comparisons, the indices of inputs of materials, labour etc are loaded in the price arriving formula for the period between the last bids opening date to the current bid opened date. The wholesale price index, consumer price index, several material price indices and labour cost indices are periodically released by government of India, which are taken to calculate the reasonability of rate through comparison.
After loading the indices between the manual procurement periods and e-procurement scenario the comparisons reflect a reduction at least 2% in the contract award value. Even though it is quite difficult to attribute the quantum of price reduction to each of e-procurement benefits, it is evident that all round benefits like competition, processes efficiency, quicker payment, savings in resources can fetch an effective contract price.

7.8 Turn Over Ratio (TOR)

As IR is maintaining supply chain for its operation and maintenance through its 268 warehouse at strategic locations, it is imperative to maintain an optimized inventory turns for minimizing inventory carrying cost with maximum availability of all materials for IR operations. IR measures and publishes continuously these efficiency turnover ratios (the ratio of inventory balance to the total value of purchase made during the year) to exhibit its improvement. Besides the material stocked with IR at any time is locked up capital, every year Ministry of Railways pay 7% dividend to the Federal Government for the value of materials kept in stock without usage. For optimization IR continue to face challenges in striking a balance between the quantum of inventory to be maintained visa-a-vis risk/loss threats involved in stock out situation or over stock situations.

The study reveals that the TOR of IR has improved during the e-procurement regimen from 14% to 10% during the year 2012-13 [1]. The reduction in TOR could be attributable due to visibility of procurement process planning, utilization of the time saved for better management functions on 24X7 real-time basis, decision supporting systems in conducting the PP and arriving lead-time, Reduction in procurement cycle time, reduction in risks due to wider vendor base and its satisfaction, effective contract monitoring mechanism, Decision supporting systems through Management information.

7.9 Bid Invitation cost

In any PP creating competition among suppliers to obtain best value for money spent is imperative. To reach a wider vendor base it is common practice to advertise the bid invitation in newspapers and journals etc. According to Government of India General Financial Rules in public tendering every notice inviting tender has to be published in the newspapers. For this IR advertises each open contracting bid invitation in multiple news papers to reach the targeted audience. For each item advertisement, the average cost involved the previous cost was $800. Consequent to the e-procurement implementation in IR, this expenditure is minimized to a larger extent and brought down to $10 per item. So far in the IR electronic procurement portal 13000 vendors are registered, who regularly watch the tenders floated (so far tender floated in the IR e-procurement portal is 470,000) for them to participate as they desire. Further as vendors are also available in the Railway database on item wise, when an e-tender is uploaded in the website, email and SMS alerts are sent to the respective vendors. However to comply with the public procurement ethics of advertising a skeleton advertisement indicating the list of items is inserted in the popular newspaper and asking the vendors to refer the e-procurement portal of IR to participate in the tender. As the entire bid document is uploaded in the website, the cost savings in issuing exhaustive advertisement material is also saved.

7.10 Process Efficiency and Procurement Effectiveness

7.10.1 Commercial Tabulation

After bids are opened, for the next stage of deciding contract award, commercial evaluation, technical evaluation of the bids received is a vital input for assessing the most advantageous bid. IR follows the PP ethics of accepting the lowest acceptable offers meeting with tender requirements. In the e-procurement as all the commercial and technical details of the bid is entered and captured online in a structured form, both commercial comparison of all offers and technical comparisons of bids are generated automatically which can be accessed by the stakeholders of PP decision making. While studying the archive files of the sample item’s contracts reveals that after bid opening date it took 7 to 10 days to prepare a commercial tabulation statement, which in turn is vetted by the finance branch for its correctness involving another 5 days. After receipt from the finance the file had to be sent again to the technical department for technical evaluation which took another 7-10 days. The benchmark time fixed for these two tabulation comparison by IR is 15 days each including the time involved in back and forth file movements. Now this time is saved as these comparisons are instant and always available online.

7.10.2 Availability of items and Crisis reported items

For operation and maintenance of IR, un-interrupted supply of materials is essential. But for the risks such as trade failure, sudden fluctuations in the material requirements, in-effective planning, excessive consumption due unforeseen situations and other technical problems and delays in procurement function, always some items runs out of stock. To address such of these risks and to take remedial actions at regular intervals, co-ordination meetings at
zo nal Railway level are conducted with the warehouse managers, consumers, finance branch and PP Authorities. In these meetings the crisis items reported as critical by the field units are included in the agenda were found to be only 22 items in comparison to the earlier average of 55 items projected as critical during manual procurement regime five years back. The improvement could be attributable to the e-procurement benefits of real-time information availability for monitoring and taking remedial actions promptly. The study reveals that in the recent times IR has seriously took the issue of all round availability of items, which reflected in the improvement of availability of 98% from the 86% availability during manual procurement periods.

7.11 Competitive Markets

In manual procurement, one of the challenges faced is to send the bid enquiry to all the probable competitive sources who can offer bids meeting with IR requirements. Despite the open bid invitation through advertisements, if the advertisement is not reaching to the most competitive supplier the purchaser cannot get most advantageous bid. Similarly the challenges like sending bid documents and receiving bids through postal/courier is fraught with delays that sometime leads to missing of competitive offers, thereby the contract award is at higher rates. After e-procurement, the data collected reflects that for each tender the number of bids have increased from five to nine showing better competition. In comparison to manual tendering for each item the number of approved vendors to supply the item has increased from 4 to 6 reflecting a wider vendor base that results in better competition, lesser rates with more number of bids in e-procurement system.

8. Conclusion

The gist of the consolidated comparison of measured metrics in e –procurement is in table 9

<table>
<thead>
<tr>
<th>Key performance Indicator</th>
<th>Erstwhile manual system</th>
<th>Implemented e-procurement system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Re-engineered online procurement planning time</td>
<td>125days</td>
<td>28days</td>
</tr>
<tr>
<td>Procurement office file pages average (paperwork)</td>
<td>285pages</td>
<td>32pages</td>
</tr>
<tr>
<td>Bid opening time fixed after tender approval</td>
<td>90days</td>
<td>30days</td>
</tr>
<tr>
<td>Time involved in opening the bid after due date</td>
<td>60 minutes</td>
<td>5minutes</td>
</tr>
<tr>
<td>Commercial comparative evaluation of bids</td>
<td>3 days</td>
<td>Only online print time</td>
</tr>
<tr>
<td>Bid opening to actual contract award date</td>
<td>95days</td>
<td>24days</td>
</tr>
<tr>
<td>Lead time involved from award to delivery</td>
<td>60 to 300days</td>
<td>30 to 180days</td>
</tr>
<tr>
<td>Advertisement cost in open contracting</td>
<td>$ 800 per tender</td>
<td>Only $10 to publish</td>
</tr>
<tr>
<td>Average open bid competing vendors</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Average number of suppliers for the item</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Inflation/price index adjusted product cost</td>
<td>NA</td>
<td>5% average reduction</td>
</tr>
<tr>
<td>Un-interrupted products availability for operations</td>
<td>86%</td>
<td>98%</td>
</tr>
<tr>
<td>Inventory Turnover Ratio</td>
<td>30%</td>
<td>13%</td>
</tr>
<tr>
<td>Monthly crisis reported to corporate office</td>
<td>55 items</td>
<td>12 items only</td>
</tr>
<tr>
<td>Time lag between supply and vendor payment</td>
<td>35days</td>
<td>9days</td>
</tr>
</tbody>
</table>

At a time when, it appears that there is lack of research in measuring the e-procurement benefits in governments continuously through specific metrics, in this study it was demonstrated through the e-procurement archived secondary data that there are several benefits in e-procurement compared to the manual procurement in IR. Within the available time some of the KPI data were retrieved for study and the e-procurement performance benefits were measured with reference to the earlier procurement methods. This paper lays a foundation that IR has to embed in their information systems to capture continuously the performance indicators and monitor it continuously so that consistent improvement can be attempted. Such a performance measurement in efficacy of procurement can be tool to reflect the actual performance measures and inter-se position among different public procurement authorities spread across the IR network.

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References


Firm Participation and Competition in Public Procurement: Evidence from the Finnish Municipal Tenders

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ABSTRACT
Competitive market environment is crucial in public procurement in order to realize benefits from competitive bidding. Therefore, there should be a sufficient number of bidders participating in public tenders to secure competitive market. This study explores the impact of different contract types to the participation rate in public procurement. Furthermore, this paper also addresses the influence of the number of bidders and strategic variables on competition in bidding contests. We use data from procurement contracts issued in 2011 by a centralized regional contracting authority located in Eastern Finland. The data set contains 363 contracts. These are analyzed with OLS, tobit and probit regressions. The findings suggest that lots contracts and supply contracts receive fewer bidders, whereas contracts with multiple suppliers draw in more bidders. Also, there is a strong positive link between the number of interested firms and received bids. The results suggest that increasing the number of bidders has a positive impact on competition in public procurement as the auction theory suggests. We suggest that the use of different contract types should be assessed with respect to their impact on competition in the market.

Keywords: Bidding, Competition, Procurement Contracts
JEL: L1, L2, L3

1. INTRODUCTION
The Finnish law on public procurement (Laki julkisista hankinnoista 2§), which implements the EU directives on public procurement, mandates the contracting authority (CA) to exploit a competitive environment in the markets in public sector procurement. Carrying out public procurement in a competitive market is one of the most important objectives in public procurement, because an efficient allocation of resources results from multiple sellers pursuing their own self-interest in a free market. The theory of price competition predicts that the efficient resource allocation can be realized when only two sellers of a homogeneous good engage in price competition. In practice, however, multiple sellers are a pre-requisite for this outcome.

Attracting firms to bid in public sector tenders is crucial in order to exploit the benefits from competition between bidders. Another reason is that chances of the winner’s curse, where the winning bidder receives a negative or lower than expected profit as a consequence of aggressive bidding, diminish with competition (Wilson 1977; Thaler 1992). The tenders organized by local governments attract more bidders than the tenders of other public bodies, such as the central government or regional governments (Pwc et al. 2011). In every level, CAs may influence the number of received bids with contracting choices.

There is a variety of contract options at disposal when CA invites firms to submit bids in a public tender. A tender may be open for all bidders that meet the prescribed criteria, or a restrictive bidding procedure where pre-selected firms are invited to bid. More complex – and less often used - procedures include competitive dialogue, electronic auctions and dynamic purchasing. Open tendering procedures are the most common tendering method. They account for 73% of tenders in Europe (Pwc et al. 2011). The contract size could have profound impact on competition. Large aggregated contracts tend to attract bids only from large firms blocking effectively bids from small and medium sized enterprises (SMEs) (GHK 2010; Davis 2013). Contracting may also be carried out through framework agreements where CA and the chosen supplier(s) agree on the terms (e.g. price) of a supply contract for a given period. Framework agreements are typically large which discourages SME participation and potentially stifles competition. One option is to divide a large contract into lots which improves the SMEs’ access to public procurement.
The previous research on competition in the auctions organized by the public sector stems from the United States federal government’s outer continental shelf (OCS) lease auctions for oil and gas drilling rights. The instrument used in these studies was the “money left of the table" (MLOT), also known as bid dispersion, which measures the difference between the winning bid and the second highest bid. In general, an increase in the number of bidders lead to lower bid dispersion (e.g. Dougherty and Lohrenz 1976; Saidi and Marsden 1993). In other contexts, this approach has been applied in construction auctions where similar findings have been observed (Dyer and Kagel 1996; Bilginsoy 2000).

There is very little research on how the contract options available to CA affect the number of bidders and competition in public sector tenders. To address this gap in the literature, this study explores public procurement market from the perspective of competition with a two-fold approach. First, we carry out an exploratory study on how contracting options and other factors affect the number of received bids. Second, we examine how the number of bidders impacts competition in tenders. We use empirical data from the municipal public procurement tenders carried out by a centralized contracting authority in Eastern Finland in 2011.

This study has two key contributions. First, we show that the contracts awarded to multiple suppliers receive more bids, and the more interested suppliers view the call, the more bids CA receives. These contract types are also less likely to attract only a single bidder. Second, our results indicate that in general, competition increases with the number of bidders and potentially decreases the incidence of the winner’s curse.

This paper proceeds as follows. In section 2, we provide a brief literature review. In section 3, we introduce the data and methods employed in the study. The results are reported in section 4. Finally, section 5 concludes the paper.

2. LITERATURE REVIEW
Reverse auctions are a common way to organize public procurement. In this method, the contracting authority invites bids from all interested suppliers or a restricted set of suppliers who submit a sealed bid to the tendering offer. The contract(s) are then awarded to the firm(s) that submitted the lowest bid(s) or received the highest score(s) in the economically most advantageous criterion (EMAT). Auctions are popular because sellers may obtain an economically desirable outcome with a relatively low number of bidders in an auction (Bulow and Klemperer 2009).

One can safely assume that the auctioning mechanism used in public procurement is usually the first-price sealed-bid auction, where bidders have a common value for the auctioned object. That is, the value is the same for all bidders, but each bidder has private information about its true value. The outcome of an auction depends on how many competing bids it attracts. The auction theory predicts that, the winning bid corresponds to the true value of the auctioned object (Wilson 1977). Subsequently, a bidding contest becomes more competitive when the number of bidders increases (Milgrom and Weber 1982). The number of bidders in a single auction may also signal about the quality of the auctioned object (Hendricks et al. 1987).

The private signal about the true value is important because the bidder who has the highest signal bids accordingly and wins the auction (Klemperer 1999). This may lead to the winner’s curse which occurs when a bidder overpays which results from biased estimation of the object’s true value or the bidder’s own cost structure (Milgrom 1989). Subsequently, the winner’s profit is less than expected or he incurs losses (Thaler 1992). Furthermore, if bidders are uncertain about the realized cost structure during the contracting period, they may forego bidding (see e.g. Milgrom 1989).

The winner’s curse is a well-known hazard in auctions. From the public sector’s perspective, it is problematic because it may lead to higher costs, lower quality, order delays, and legal expenses (Bilginsoy 2000). In extreme cases a consequence could be a business failure from which the public sector bears the social and pecuniary costs. On the other hand, attempts to avoid the winner’s curse could also prove detrimental to the procurer. If bidders anticipate the winner’s curse, they internalize it and bid more cautiously (Hong and Shum 2002). This creates an adverse selection problem which leads to higher bids and consequently, higher costs to the public sector.

An important stream of empirical research on the public sector’s auctions where private sector bidders compete against each other has focused on the OCS lease auctions. Dougherty and Lorenz (1976) report that the absolute value of the “money left on the table" (MLOT), also known as bid dispersion, decreases if the number of bidders increases. This is further corroborated by Saidi and Marsden (1993). However, Hendricks et al. (1987) report the
opposite result. Another stream of research has focused on bidding in construction contracts. Dyer and Kagel (1996) show that MLot decreases with the number of bidders, a finding also confirmed by Bilginsoy (2000).

3. DATA AND METHODOLOGY

3.1 Data Source
This paper uses data from bidding contests organized by Joensuu Region Contracting Authority (referred to as JRCA henceforth) which is a centralized contracting authority for public procurement in the province of North Karelia, Finland. JRCA organizes public tendering on behalf of the North Karelian municipalities and other partners including, for example, the district’s public health care organization which is jointly owned by the municipalities. A major missing component, which has not been delegated to JRCA, is the construction works for the public sector. The total volume of public purchasing from private enterprises was approximately €150 million in 2011 (Saastamoinen et al. 2013).

JRCA carries out most public contracting above the national threshold of €30,000 (at the time) using an electronic public procurement system. All willing bidders must register with the system before they can submit a bid in a call for tenders. JRCA was the first contracting authority in Finland, and among the pioneers in Europe, to move solely to electronic procurement in 2007.

The data set utilized in this study consists of all JRCA’s published tenders in 2011. The data provide information on the awarded procurement contracts and submitted bids. JRCA’s electronic procurement system provides also information on potential bidders as all interested parties that have viewed an open call are included in the data. The data give a wide perspective on public procurement as previous studies have concerned only certain sectors, such as construction (e.g. Dyer and Kagel 1996; Bilginsoy 2000). The data have been hand-collected from JRCA’s proprietary electronic archive. Altogether the data have 363 individual tenders including tenders from lots contracts. Technically, all tenders were reverse first-price sealed-bid auctioning mechanism. If we exclude the tenders where CA received only a single bid, the data set reduces to 266 tenders. A handful of tenders were dropped from the data set because final bids could not be extracted from the award notices. In one case, for example, a contract was awarded to the bidder that gave the largest discount percentage from its catalogue.

The data have some drawbacks that warrant caution when interpreting results. First, the used measures are not mutually exclusive, which, in turn, leads to high correlations between variables. Subsequently, this could exacerbate multicollinearity in the regression analysis. Second, the sample size is relatively low, which has impact on the statistical properties of estimates. Third, tenders are very heterogeneous; they range from provision of assisted housing for the elderly to a purchase of tires. Consequently, contract values exhibit large variation.

3.2 Measures
The measures used in study have been extracted from JRCA’s tenders. A dummy variable is assigned to different contract types which are not mutually exclusive. Continuous variables have been constructed from bids (the average bid value, MLot, the number of bidders), the number of interested bidders and the EMAT criteria.

To obtain the best value for money, CAs use measurement scales and criteria for qualitative factors in complex procurements (Pacini 2013). Consequently, the tenders where the EMAT criteria are being applied are scoring auctions. While there are many ways to prescribe what constitutes the economically most advantageous tender, we use the proportion of price as a proxy for qualitative measures in an EMAT criterion. The significance of price (p) takes the value 0 if price has no significance in the selection process, a value between 0 and 100 if qualitative factors have some significance, and 100 when the winning bid is determined by pure price competition.

The submitted bids provide information on bid values and the number of bidders. We use the mean of bid values in an individual tender as a proxy for contract size. As a measure for competition in markets and the winner’s curse, we use the money left on the table which measures the difference between the second lowest and lowest bid. MLot has been used as a measure of competition in empirical studies (e.g. Dougherty and Lohrenz 1976; Hendricks et al. 1987; Saidi and Marsden 1993; Dyer and Kagel 1996; Bilginsoy 2000). We compute MLot as an absolute difference between the two lowest bids or a relative difference between the two lowest bids. The number of bids submitted in a single tender provides the number of bidders.
3.3 Descriptive Statistics

Table 1 reports the continuous variables that were extracted from the data. We report two separate figures for tenders, one for the calls where more than one bids were received, and one for all tenders which includes also the calls where only a single bid was received. In text, we use the statistics derived from the full data.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Number of Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>4.30</td>
<td>3</td>
<td>4.13</td>
<td>2</td>
<td>42</td>
<td>266</td>
</tr>
<tr>
<td>[3.42]</td>
<td>[2]</td>
<td>[3.82]</td>
<td>[1]</td>
<td>[42]</td>
<td>[363]</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>21.24</td>
<td>12</td>
<td>30.59</td>
<td>2</td>
<td>175</td>
<td>266</td>
</tr>
<tr>
<td>[18.61]</td>
<td>[12]</td>
<td>[26.92]</td>
<td>[1]</td>
<td>[175]</td>
<td>[363]</td>
<td></td>
</tr>
<tr>
<td>B₂ – B₁</td>
<td>7170.67</td>
<td>332.73</td>
<td>35208.60</td>
<td>0</td>
<td>457450</td>
<td>266</td>
</tr>
<tr>
<td>ln(B₂ – B₁ + 1)</td>
<td>5.65</td>
<td>5.81</td>
<td>2.98</td>
<td>0</td>
<td>13.03</td>
<td>266</td>
</tr>
<tr>
<td>(B₂ – B₁)/B₁</td>
<td>.43</td>
<td>.13</td>
<td>2.10</td>
<td>0</td>
<td>32.9</td>
<td>266</td>
</tr>
<tr>
<td>ln(B₂) – ln(B₁)</td>
<td>.23</td>
<td>.13</td>
<td>.34</td>
<td>0</td>
<td>3.52</td>
<td>266</td>
</tr>
<tr>
<td>CV</td>
<td>.24</td>
<td>.19</td>
<td>.23</td>
<td>0</td>
<td>1.61</td>
<td>266</td>
</tr>
<tr>
<td>Sd.</td>
<td>9697.77</td>
<td>611.59</td>
<td>40604.73</td>
<td>0</td>
<td>517791.2</td>
<td>266</td>
</tr>
<tr>
<td>B</td>
<td>68353.04</td>
<td>5225.41</td>
<td>421979.60</td>
<td>.93</td>
<td>6320431</td>
<td>266</td>
</tr>
<tr>
<td>[52561.33]</td>
<td>[3546.87]</td>
<td>[351557.1]</td>
<td>[.71]</td>
<td>[6062820]</td>
<td>[363]</td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>80.47</td>
<td>90</td>
<td>22.98</td>
<td>40</td>
<td>100</td>
<td>225</td>
</tr>
<tr>
<td>[81.76]</td>
<td>[90]</td>
<td>[23.06]</td>
<td>[40]</td>
<td>[100]</td>
<td>[284]</td>
<td></td>
</tr>
</tbody>
</table>

Notes: The figure in parentheses includes also the tenders where only a single bid was received. 
n: Number of bidders. 
N: Number of interested bidders. 
B₂ − B₁: The difference between the two lowest bids. 
ln(B₂ − B₁ + 1): A logarithmic transformation of the difference between the two lowest bids. 
(B₂ – B₁)/B₁: A relative difference of the difference between the two lowest bids. 
ln(B₂) – ln(B₁): A logarithmic transformation of the relative difference between the two lowest bids. 
B: The average bid size (Euro). 
p: The proportion of price in percentage points [0, 100] in the applied EMAT criterion.

Table 1. Descriptive Statistics of Continuous Variables.

On average, a tender attracted 3.4 bidders with a standard deviation of 3.8 bidders. This is less than the reported Finnish average of 5.7 bids (Pwc et al. 2011). However, open calls attracted a considerably larger interest among potential bidders because the average number of viewers was 18.6 with a standard deviation 26.9. The average contract size was €52,500.

Several categorical variables, which take either the value 1 or 0, that describe the used contract types or their combinations are reported in Table 2. Three quarters of tenders were lots contracts (lots_d) where a contract is divided into lots which are auctioned separately within a tender. Almost 65% of tenders were framework agreements (frame_d). Over a half of contracts were awarded to multiple winners (multi_d). Nearly a half of contract values were above the EU threshold (eu_d), €100,000 at the time, and 42% were above the national threshold (nat_d), €30,000 at the time. Thus, remaining ten percent of the published tenders were below either of these thresholds, and there was no legal requirement to organize a public call for bids for them. Supplies (sup_d) were procured more often than services (serv_d) with approximately 60/40 ratio. A remaining handful of contracts were public works contracts, but the number of observations for them was so low that they were not given a separate dummy variable. The vast majority of contracts were open tenders. Restricted tendering (res_d), where the chosen bidders are screened and invited to bid, was used only in 15% of the cases. Competitive dialogue or negotiated tenders were not utilized in the sample.

3.4 Methods

The statistical analysis is carried out using regression analysis. In section 4.1, we analyze the factors contributing to the "single bid tenders", which are the tenders where only a single bid could be accepted (in vast majority of cases, this was the only bid received) with probit regression. In section 4.2, we study the factors that
contribute to the number of bids received in tenders with OLS and tobit regression. In section 4.3, we determine which factors contribute to competition in bidding contests using OLS and tobit regression.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Relative Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract value above the EU threshold (eu_d)</td>
<td>126</td>
<td>47.4</td>
</tr>
<tr>
<td></td>
<td>[156]</td>
<td>[43.0]</td>
</tr>
<tr>
<td>Contract value above the national threshold (nat_d)</td>
<td>102</td>
<td>38.3</td>
</tr>
<tr>
<td></td>
<td>[153]</td>
<td>[42.1]</td>
</tr>
<tr>
<td>Lots contract (lots_d)</td>
<td>200</td>
<td>75.2</td>
</tr>
<tr>
<td></td>
<td>[278]</td>
<td>[76.6]</td>
</tr>
<tr>
<td>Service contract (serv_d)</td>
<td>106</td>
<td>39.8</td>
</tr>
<tr>
<td></td>
<td>[127]</td>
<td>[35.0]</td>
</tr>
<tr>
<td>Supplies contract (sup_d)</td>
<td>158</td>
<td>59.4</td>
</tr>
<tr>
<td></td>
<td>[231]</td>
<td>[63.6]</td>
</tr>
<tr>
<td>Restrictive tendering (res_d)</td>
<td>40</td>
<td>15.0</td>
</tr>
<tr>
<td></td>
<td>[53]</td>
<td>[14.6]</td>
</tr>
<tr>
<td>Framework agreement (frame_d)</td>
<td>172</td>
<td>64.7</td>
</tr>
<tr>
<td></td>
<td>[221]</td>
<td>[60.9]</td>
</tr>
<tr>
<td>Single bid tender (onebid_d)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>[96]</td>
<td>[26.4]</td>
</tr>
<tr>
<td>Contract awarded to multiple bidders (multi_d)</td>
<td>144</td>
<td>54.1</td>
</tr>
<tr>
<td></td>
<td>[183]</td>
<td>[50.4]</td>
</tr>
</tbody>
</table>

Notes: Figures in parentheses include the tender calls where only a single bid was submitted.

Table 2. Categorical Variables.

4. RESULTS
4.1 Single Bid Tenders
A large number of tenders in the JRCA data set failed to attract rival bids. Only one bid was received in 96 out of 362 tenders. This is close to the reported European average of 1 in 5 tenders receiving a single bid (PwC et al. 2011). We use a probit regression model to determine the types of contracts that yielded only one bid.

The regression model uses onebid_d as the dependent variable, which takes the value 1 if only one bid was received in a call for tenders and 0 otherwise. The explanatory variables in the model include dummy variables for contracts above the EU threshold, contracts above the national threshold, goods contracts, framework agreements, lots contracts, and the tenders where the contract is awarded to more than one supplier. The continuous variables are inverses for the proportion of price in the applied EMAT criteria (inv_p), the number of interested bidders (inv_n), and the average bid value (inv_B) as a proxy for the contract size.

Estimates from probit regression and marginal effects for the estimates are reported in Table 3. The estimates show that goods contracts and lots contracts increase the probability of single bidder tenders. In comparison to services contracts, supplies contracts are 15% more likely to attract only one bidder. Lots contracts have nearly 17% higher chance of a single bid. In contrast, the tenders where a contract is awarded to multiple suppliers decrease the likelihood of one bidder by almost 25%. Furthermore, the more interest a contract raises among potential bidders, the less likely is the one bidder outcome as the probability drops by 57% with each additional potential bidder. Other variables are not statistically significant.

4.2 Tenders with Several Bidders
Next we estimate which contract characteristics instigate bidding. The dependent variable in the regression model is the inverse of the number of bidders (inv_n). We run both OLS and tobit regressions, where the latter censors the tender calls where only a single bid was received. The dependent variables include the same variables as in the single bidder case augmented with a dummy for the restricted bidding process.

The estimates are reported in Table 4. Both OLS and tobit yield estimates that are close to each other even though the number of censored observations is fairly high in the tobit model. The model has also a reasonably good coefficient of determination (.263). The results indicate that lots contracts and the procurement of supplies (compared to services) attract less bidders. By contrast, contracts that are awarded to multiple suppliers receive more bids. There is also a positive link between the number of bids and the contract value. In addition, the more interested suppliers view the call, the more bids CA receives. Other variables are not statistically significant.
Table 3. Probit Estimates for Single Bidder Contests.

<table>
<thead>
<tr>
<th></th>
<th>Estimated Coefficient</th>
<th>Marginal Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>-0.457</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.653)</td>
<td></td>
</tr>
<tr>
<td>eu_d</td>
<td>0.108</td>
<td>0.026</td>
</tr>
<tr>
<td></td>
<td>(0.477)</td>
<td>(0.116)</td>
</tr>
<tr>
<td>nat_d</td>
<td>-0.391</td>
<td>-0.090</td>
</tr>
<tr>
<td></td>
<td>(0.425)</td>
<td>(0.092)</td>
</tr>
<tr>
<td>sup_d</td>
<td>1.058***</td>
<td>0.228***</td>
</tr>
<tr>
<td></td>
<td>(0.302)</td>
<td>(0.055)</td>
</tr>
<tr>
<td>frame_d</td>
<td>-0.055</td>
<td>-0.014</td>
</tr>
<tr>
<td></td>
<td>(0.310)</td>
<td>(0.078)</td>
</tr>
<tr>
<td>lots_d</td>
<td>0.822***</td>
<td>0.164***</td>
</tr>
<tr>
<td></td>
<td>(0.301)</td>
<td>(0.047)</td>
</tr>
<tr>
<td>multi_d</td>
<td>-1.408***</td>
<td>-0.357***</td>
</tr>
<tr>
<td></td>
<td>(0.405)</td>
<td>(0.099)</td>
</tr>
<tr>
<td>p</td>
<td>-0.004</td>
<td>-0.001</td>
</tr>
<tr>
<td></td>
<td>(0.005)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>inv_N</td>
<td>2.447***</td>
<td>0.604***</td>
</tr>
<tr>
<td></td>
<td>(0.885)</td>
<td>(0.225)</td>
</tr>
<tr>
<td>ln(B)</td>
<td>-0.109***</td>
<td>-0.027***</td>
</tr>
<tr>
<td></td>
<td>(0.036)</td>
<td>(0.099)</td>
</tr>
<tr>
<td>Wald Chi²</td>
<td>43.96***</td>
<td></td>
</tr>
<tr>
<td>Pseudo-R²</td>
<td>0.134</td>
<td></td>
</tr>
<tr>
<td>Number of Obs.</td>
<td>279</td>
<td>279</td>
</tr>
</tbody>
</table>

Notes: * p-value < 0.1; ** p-value < 0.05; *** p-value < 0.01. Standard errors in parentheses. Robust standard errors used.

4.3 Competition in Public Sector Tenders

The competitiveness of tenders is measured with bid dispersion, or the money left on the table, MLOT. We use logarithmic transformations of the relative MLOT as the dependent variable in regression analysis because its distribution is much closer to the normal distribution than a pure value MLOT's distribution. Due to large variation in contract values, the absolute value MLOT is not a useful measure in this setting.

The following variables are included in the applied regression models. The variable of interest is the number of bidders. The set of control variables include dummy variables for contracts above the EU threshold, contracts above the national threshold, goods contracts, framework agreements, lots contracts, and the tender calls where the contract is awarded to more than one supplier. The continuous variables are the proportion of price in the applied EMAT criteria and the logarithmic transformation from the average bid value as a proxy for the contract size. For a large number of tenders we could not assign a quantitative measure of the applied EMAT criteria and hence, we run also regressions where the proportion of price has been dropped.

Table 5 reports the estimated coefficients from OLS and tobit regressions. The tobit regressions censor the lower limit which is zero. Regressions A1 to A6 use the relative MLOT and regressions B1 to B6 use the absolute MLOT as the dependent variable. Although the average variance inflation factors (VIFs) remain under the problematic threshold of 4 (O'Brien 2007), which suggests that multicollinearity may not be problematic. As in Bilginsoy (2000), we estimate "pure models" (A1, A2, B1 and B2) where the potentially collinear control variables are omitted. Regressions A3, A4, B3 and B4 do not include the EMAT variable. Regressions A5, A6, B5 and B6 are “full models” where all control variables are present.

In regressions A1 to A6, the variable of interest, the number of bidders, exhibits similar results. Bid dispersion declines when the number of bidders increases. This implies that increasing the number of bidders intensifies competition and consequently, leads to a less severe winner’s curse. This finding is robust to the employed regression method and model. However, none of the control variables is statistically significant. Furthermore, the joint significance of covariates is poor; only the pure models have sufficiently high F-statistics.

In regressions B1 to B6, the variable of interest, the number of bidders, exhibits similar results in full models (B3 to B6), but lacks the statistical significance in pure models (B1 and B2). In the full models, the absolute bid dispersion declines when the number of bidders increases after controlling for the average contract size. Other covariates, however, are not statistically significant. The joint significance of covariates is very high in full models. Overall, these findings are in line with the previous research (e.g. Dyer and Kagel 1996; Bilginsoy 2000).
<table>
<thead>
<tr>
<th>Variable</th>
<th>Estimate (OLS)</th>
<th>Estimate (Tobit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>.535***</td>
<td>.599***</td>
</tr>
<tr>
<td></td>
<td>(.127)</td>
<td>(.159)</td>
</tr>
<tr>
<td>lots_d</td>
<td>.158***</td>
<td>.194***</td>
</tr>
<tr>
<td></td>
<td>(.045)</td>
<td>(.058)</td>
</tr>
<tr>
<td>sup_d</td>
<td>.226***</td>
<td>.251***</td>
</tr>
<tr>
<td></td>
<td>(.040)</td>
<td>(.049)</td>
</tr>
<tr>
<td>frame_d</td>
<td>-0.033</td>
<td>-0.040</td>
</tr>
<tr>
<td></td>
<td>(.057)</td>
<td>(.073)</td>
</tr>
<tr>
<td>eu_d</td>
<td>0.053</td>
<td>0.056</td>
</tr>
<tr>
<td></td>
<td>(.100)</td>
<td>(.126)</td>
</tr>
<tr>
<td>multi_d</td>
<td>-2.78***</td>
<td>-3.25***</td>
</tr>
<tr>
<td></td>
<td>(.088)</td>
<td>(.112)</td>
</tr>
<tr>
<td>res_d</td>
<td>-0.025</td>
<td>-0.071</td>
</tr>
<tr>
<td></td>
<td>(.088)</td>
<td>(.112)</td>
</tr>
<tr>
<td>nat_d</td>
<td>-0.043</td>
<td>-0.066</td>
</tr>
<tr>
<td></td>
<td>(.095)</td>
<td>(.126)</td>
</tr>
<tr>
<td>p</td>
<td>-0.001</td>
<td>-0.001</td>
</tr>
<tr>
<td></td>
<td>(.001)</td>
<td>(.001)</td>
</tr>
<tr>
<td>inv_N</td>
<td>.733***</td>
<td>1.011***</td>
</tr>
<tr>
<td></td>
<td>(.148)</td>
<td>(.254)</td>
</tr>
<tr>
<td>ln(B)</td>
<td>-0.027***</td>
<td>-0.031***</td>
</tr>
<tr>
<td></td>
<td>(.007)</td>
<td>(.009)</td>
</tr>
</tbody>
</table>

F-statistic | 21.20***       | 12.76***         |
R^2          | .263           | .231             |
Observations | 279            | 279              |
Censored observations | - | 57 |
Average VIF | 3.68           | -                |

Notes: * p-value < 0.1; ** p-value < 0.05; *** p-value < 0.01.
Standard errors in parentheses, robust standard errors used.

Table 4. OLS and Tobit Estimates for Tenders with Several Bidders.
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>.117**</td>
<td>.100*</td>
<td>.139</td>
<td>.135</td>
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Notes: * p-value < 0.1; ** p-value < 0.05; *** p-value < 0.01. Standard errors in parentheses. Robust standard errors used in regressions B1 to B6.

Table 5. OLS and Tobit Estimates for Competition in Public Sector Tenders.
5. CONCLUSION
5.1 Concluding Remarks
This purpose of this article was to study firm participation and competition in public procurement. We explored the factors that contribute to competition through the number of received bids and bid dispersion in public sector tenders using data from a centralized contracting authority in Eastern Finland. The analysis was carried out using OLS, probit and tobit regressions.

Regarding the number of bidders, our results show that that goods contracts and lots contracts are more likely to receive only a single bid, and also less bids in general. By contrast, the tenders where multiple suppliers secure a contract, and the more interest a tender attracts among potential suppliers, are less likely to have a single bidder, and in general, these contracts receive more bids. Furthermore, there is also a positive link between the number of bids and the contract value. Our findings show that the number of bidders reduces bid dispersion which is the difference between second lowest and lowest bids. This finding is in line with the previous research.

5.2 Managerial Implications
The results have few key implications for procurement managers, especially contracting authorities. First, our findings suggest that there is a strong positive connection with the number of interested viewers of open calls for bids and the number of bidders in the actual tender. In consequence, making potential bidders aware of the upcoming tenders should be a priority for contracting authorities. Second, we find that the contracts where the supply contract will be made with several parties receive more bids than other contract types (ceteris paribus). Thus, the contracting authority should determine whether the benefits from competition resulting from the increased number of bidders outweigh the potential of higher bids resulting from the expected loss of economies of scale. Third, our results suggest that lots contracts may not attract as many bidders as other contracts. Therefore, the contracting authority should consider whether dividing a contract into lots spurs competitive bidding for smaller contracts that offsets the economies of scale available in larger contracts.

5.3 Limitations and Future Research
This study has some limitations that could impact the results. First, the data set is from a limited geographical area and a single contracting authority. Second, the studied contracts are very heterogeneous. Third, the sample size is relatively small. Thus, a larger data set could provide additional insights into how different contract types impact competition in public sector tenders.

The future research should address the limitations in this study. An additional dimension could be time series data which could be used to study, for example, whether there is a learning process in bidding for public sector contracts at an individual firm’s level. Furthermore, studying the firms that participate in public sector tenders with more detail, such as a sector, firm size, could provide additional insight into competitive dynamics in public procurement.

References


THE EVOLUTION OF THE WORLD BANK’S PROCUREMENT POLICY


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1. INTRODUCTION

The World Bank is a development finance institution established by virtue of the Bretton Woods agreement to provide reconstruction aid to the countries devastated by World War II.¹ The success of the Bank in doing this meant that it soon refocused its objectives to provide development finance to “under-developed” countries.² Like many multilateral agencies, the Bank imposes good-governance and anti-corruption requirements on borrower countries where it provides structural lending or finances a development project and requires that the procurement process for funded projects is conducted according to Bank mandated procedures.³

The Bank’s procurement policy has undergone significant revision since the first formal procurement procedures were issued in 1964, to reflect changes in the Bank’s approach to corruption; changes in the Bank’s membership; changes in the field of procurement and in the Bank’s own lending products.⁴ In 2012, the Bank commenced the most substantial reform of its procurement policy yet, which is part of the Bank’s broader modernization agenda and reform of investment lending.⁵ This reform is intended to take into account the changing global operating context; the diverse and evolving needs of Bank clients and borrowers; and the diverse instruments the Bank now offers to promote development. Some of the recent changes in the procurement landscape which were not considered by the Bank’s previous procurement policy include public-private partnerships (PPPs) and outsourcing, which have wrought new interactions between the state and the private sector; commitments to rely more on domestic country procurement systems in Bank financed contracts as well as the efforts to harmonize the procurement practices of the Bank with the other multilateral development banks.

This paper seeks to examine the proposed changes to and the evolving nature of the Bank’s procurement policy and distill the implications for the Bank as well as for Bank Borrowers and contractors under Bank-financed contracts. The direction of World Bank procurement is of importance globally, first because the Bank provides leadership for the other multilateral development banks in relation to procurement;⁶ and second, because many developing countries engaging in the process of procurement reform are also influenced by the Bank’s own procurement policy and procedures. Despite the importance of Bank procurement in the global context, there is little academic information available on this crucial topic.

II. PUBLIC PROCUREMENT POLICY IN THE WORLD BANK: 1964 TO 2004

Almost twenty years after its establishment, the Bank realized the need to provide Bank staff with formal direction on procurement and thus in 1961, the first written procurement rules were compiled to provide guidance for staff. A few years later in 1964, the first formal instructions, which contained the procedures to be used by Bank staff in conducting international competitive bidding (ICB) were approved by the Bank's Board of Executive Directors. Although the use of ICB and other procurement procedures were formalized in 1964, ICB was introduced by the Bank as the normal procurement procedure in 1951. It was decided in 1956 that only Bank members (and Switzerland) would be eligible to bid for Bank contracts. However, the Bank now permits firms and individuals from all countries to bid for Bank-financed contracts, with limited exceptions. Preferences for domestic suppliers were introduced in 1966 and the specification of currency for bid comparisons was regulated in 1971. The first formal instructions on selecting consultants, mainly for large engineering contracts, were issued in 1966.

As stated above, these initial documents have undergone significant revision over the years to reflect changes in the Bank's approach to lending: changes in the global financial landscape; and innovations in the field of public procurement. The Bank's approach to procurement policy was premised on four considerations: economy and efficiency in the procurement process; competition; encouraging the local industry, and transparency. These policy considerations were implemented through specific procurement procedures; in particular, open and competitive bidding, which has been described as the "mainstay" of the Bank's policies for the procurement of goods, services, and works under Bank-financed projects. Open and competitive bidding was achieved through a default measure of requiring ICB for Bank-financed procurements. ICB in essence means that procurements are advertised internationally and are open to persons beyond the borrower country.

After the creation of the initial procurement guidelines in 1964, the documents were amended in 1965, in 1974, in 1985 and in 1995. During the 1970s to the 1980s, the Bank exercised its fiduciary duty by reviewing and approving all contracts and eventually shifted from the explicit approval of contracts to the use of a letter of "no-objection" given to the Borrower to proceed with the contract, a move which clarified the Bank's role as a financier and not a party to the contract. This requirement for a letter of "no-objection" from the Bank is still in use today.

In the 1980s, the Bank introduced a measure of flexibility into its procurement procedures to take into account the purchases of common or "off the shelf" items and to set thresholds for the use of ICB. The Bank also introduced price as a criterion for the consideration of consultants' contracts. In addition, the 1980s evidenced a slight, if informal move towards the use of country procurement systems where appropriate for Bank financed contracts.

The actual reliance on country systems in Bank-funded contracts were few and far between during this decade, but this set the stage for the introduction of Country Procurement Assessment Reports (CPARS) as well as the formal acknowledgement of the necessity to rely on country systems where appropriate, which twenty years later, led to the conduct of an extensive piloting program on the use of country systems. The CPAR was developed to be used as a...

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2 Ibid.
3 Bank Procurement Guidelines, para 1.8.
5 Bank Procurement Guidelines, para 1.2
6 Approach paper, page 1.
7 Bank Procurement Guidelines, para 1.3 and 1.4.
9 Initiating Discussion paper, page 2.
10 Bank Procurement Guidelines, para 1.18.
11 Initiating Discussion paper, page 3.
12 Ibid.
means of conducting a holistic review of domestic public procurement, which could be used as the basis for initiating procurement reform. As stated by the Bank, “the CPAR was intended to be an analytical tool to diagnose the health of the existing system in the country, and in the process generate a dialogue with the government focused on needed reforms…to improve a country’s system for procuring goods, works and consulting services.” Other changes that occurred during this decade were increased codification and standardization of procurement and the introduction of standard bidding documents.

Although there were several changes to the initial procurement guidelines, these changes did not in anyway signify a shift in the Bank’s underlying procurement policy and the four policy considerations mentioned above still dominated the guidelines, in spite of the introduction of new procurement methods, the increased standardization of procurement and changes to the Bank’s lending.

The most significant review of the Bank’s procurement policy occurred in 1995 when the Bank introduced a new paragraph dealing with fraud and corruption in Bank procurements. This new paragraph established the Bank’s intention to debar firms engaging in corruption in bidding for Bank-financed contracts and also contained a clause permitting borrowers to include a “no-bribery” pledge in bid documentation. The paragraph on corruption was again revised in 2004 to include collusion and coercive practices in the list of prohibited activities and grant the Bank contractual access to bid and contract documentation and the power to audit the accounts of suppliers.

It must be noted that the introduction of anti-corruption measures into the Bank’s procurement landscape was a long time coming and evidenced a dramatic shift away from the Bank’s often stated policy not to interfere in domestic corruption issues, as these were considered “political,” even if the corruption arose in Bank-financed projects. The prohibition against being influenced by political or non-economic considerations by the Bank is found in Article IV, section 10 of the Articles of Agreement, which provides that “The Bank and its officers shall not interfere in the political affairs of any member; nor shall they be influenced in their decisions by the political character of the member or members concerned. Only economic considerations shall be relevant to their decisions, and these considerations shall be weighed impartially in order to achieve the purposes stated in Article I.” However, with the assumption to the leadership of the Bank by James Wolfensohn in 1995, the Bank decided to face the issue of corruption in developmental projects head-on and determined that it could rely on another provision in its Articles which provides that loan proceeds must only used for their intended purpose; to grant legitimacy to its anti-corruption efforts.

The introduction of an anti-corruption policy into the Bank’s procurement policies had two objectives- the first was to ensure that in accordance with the Bank Articles of agreement, the Bank funds were used for the purpose for which they were intended, with due regard for considerations of “economy and efficiency” and the other was to ensure that corruption did not continue to remain an obstacle to development. The Bank’s policy against corruption is based on four main strategies. The first is to ensure that the procurement process contains preventive and punitive elements against corruption. The Bank's policy of debarring corrupt contractors guilty of various infractions assists
in executing both these elements. Second, the Bank ensures that the pre-approval stage of loans and projects is rigorous and contains input from all interested parties. Third, measures are taken to ensure that, institutionally, the Bank is corruption free and fourthly, the Bank improved auditing and supervision requirements in its projects.

It could thus be surmised that by the end of 2004, the Bank’s procurement policy was based on the four considerations mentioned above: economy and efficiency in the procurement process; competition; encouraging the local industry, and transparency; with the introduction of anti-corruption measures that increased oversight and further encouraged economy and efficiency in project procurement.


The decade between 2004 and 2014 saw a profusion of activity and shifts in the Bank’s procurement policy. Whilst the previous 50 years had witnessed mainly incremental changes to the Bank’s procurement policies, the most significant being the introduction of punitive and preventive anti-corruption measures into the Bank’s procurement guidelines, the decade between 2004 and 2014 witnessed the most significant shifts in Bank procurement policy. From the changes to the Bank’s procurement guidelines that occurred between 2004 and 2011, it can be surmised that anti-corruption and governance were at the forefront of the issues addressed in procurement on Bank-financed projects. Thus, in 2004, the Bank expanded its definition of corruption in the Guidelines to cover bid-rigging, collusion and price-fixing and also to give the Bank the right to inspect bid documentation. In addition, in 2005, the Paris Declaration as expanded by the Accra Agenda in 2008 identified the increasing reliance on country procurement systems in aid or donor financed projects as a priority for development partners. These multilateral instruments provided the impetus for the Bank to engage in its pilot on the use of country systems and the eventual provision in the Bank procurement guidelines accepting the use of a country’s system in a Bank-funded project within certain narrow limits.

In 2007, the Bank adopted a Governance and Anti-Corruption strategy, which laid out a multi-pronged program to combat corruption and improve governance among Bank borrowers. The most recent revisions to the Bank procurement guidelines in 2011 continued in this governance theme and dealt with the issue of cross-debarment amongst the development banks and provided for a new sanction of the temporary suspension of firms involved in an allegation of fraud and corruption on a Bank financed project.

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33 Paris Declaration, para 17; Accra Agenda, para 15. See also the Cuzco Declaration of the OECD/DAC Task Force on Procurement; Strong Procurement Systems for Effective States, May 2011 and the Busan Partnership for Effective Development Cooperation, 4th High Level Forum on Aid Effectiveness November 29 to December 2, 2011.
34 Bank procurement guidelines, para 3.20.
36 Bank procurement guidelines, para 1.16 (d).
These cumulative shifts in the Bank’s procurement policy in this decade were occasioned by inter alia, changes to the Bank’s methods for delivering project finance; new areas that qualified for Bank lending; increased sectoral support as opposed to project lending; the increasing complexities wrought by fragile and conflict affected states as well as global developments in public procurement, which saw far-reaching reviews of procurement by intergovernmental and multilateral bodies such as the European Union (EU) and the United Nations Commission on International Trade Law (UNCITRAL). It must be noted that these shifts were not peculiar to the Bank’s procurement space, and since the start of the new millennium and most notably, since the financial crisis of 2008, the Bank has been reevaluating its entire operations and governance framework in order to be able to respond better to unforeseen global changes and events, increase accountability, inclusiveness and participation in Bank decision-making. The Bank itself has realized that there is “a high correlation between the extent and quality of public participation and overall project quality.”10 Thus, the desire to improve the effectiveness of Bank-projects has led to concerns about “good-governance” both within and outside the Bank.40

One of the stated dimensions of good governance is the quality of policy making and public service delivery and this informs why the Bank’s procurement policies were impacted by the Bank’s governance reform agenda. In addition, and as has been discussed above, improving public procurement practices is one way of improving the effectiveness of expenditure as good public procurement practices are a major determinant of the effectiveness of public expenditure.42

Thus in 2012, the Bank commenced a holistic reform of its procurement policies, practices and procedures, which were aimed at ensuring that the Bank’s procurement policies are in alignment both with the Bank’s changing role and with the challenges and innovations that have dominated Bank operations since its procurement policy was first adopted. In other words, the reform was aimed at ensuring that the Bank’s procurement policy is in essence, fit for its purpose and aligns with the Bank’s broader modernization agenda. The review also has as its aims “the attainment of the larger goal of improving development effectiveness by encouraging the use of country systems and harmonization, building competitive local industries, strengthening public sector management, improving governance and anticorruption, promoting sustainability, accelerating investment in infrastructure, and deepening international trade, among others.”44 It is thought that these agendas converge, in some way or another, with public procurement and the review of the Bank’s procurement policy will assist in identifying both the opportunities and the trade-offs in realizing these policy goals, to exploit synergies that advance the Bank’s agenda, and to position the Bank for the future.45

43 Approach paper, pg 5
44 Initiating discussion paper, page xi para 11.
45 Initiating discussion paper, page xi, para11.
The reform commenced with a comprehensive review of the Bank’s current approach to procurement under Bank-financed operations, the first such review by the Bank since it was established. The review covered both the Bank’s operational procurement policies and procedures, and their application by the Bank and its borrowers.

The review led to the development of a new framework for procurement in Bank projects, which was adopted by the Executive Directors of the Bank in November 2013. This new framework sets out for the first time since the Bank’s inception, a vision statement for Bank project procurement, which states that “Procurement in Bank Operations supports clients to achieve value for money with integrity in delivering sustainable development.” The importance of the articulation of this vision statement cannot be over-emphasized as it means that for the first time, the Bank is clear as to what it intends its procurement policy to achieve and further, the statement explicitly puts Bank borrowers at the centre and as the beneficiaries of its procurement policy. It is instructive to note that before this review, which led to the Framework document, Bank procurement policy was imposed by the Bank on its Borrowers to meet the Bank’s requirements and fiduciary obligations and were adopted without input from the users, and often without taking into account the end-users needs. An important aspect of the vision statement is that it seeks to ensure sustainable development. This is also the first time that the Bank has development at the centre of its procurement practices as opposed to its fiduciary obligations. It also signals an acceptance of the oft-mentioned wisdom, at least at domestic level that public procurement can be a prominent tool to help achieve developmental objectives. The Framework document also emphasizes that the vision statement will be undergirded by principles of best practice in procurement, which are said to be economy, efficiency, effectiveness, integrity, openness and transparency, and fairness.

The Framework document also developed a value-proposition for the Bank. This value-proposition is focused on “achieving value for money, supporting clients in pursuing sustainable procurement goals, integration, and exercising adaptability and leadership.” Again, it must be noted that this evidences a paradigm shift for the Bank. Prior to this review, Bank procurement policy was seen as a tool to standardize procurement practices and ensure the appropriate use of Bank funds, and although the Bank prided itself on its role in setting the tone for public procurement, especially for developing countries that looked to the Bank for guidance in relation to their procurement reform, this is the first time that the Bank is expressing a formal objective to provide leadership in relation to public procurement. This leadership role will be take the form of the Bank continuing to champion procurement reform, the articulation of best practices and the Bank developing its knowledge of partner systems. In relation to the adaptability of procurement, the Framework document expresses the desire that at the micro or project level, Bank procurement arrangements will be “fit-for-purpose”. This will finally put to rest the criticism that the Bank used to adopt a “one size fits all” approach to its procurement regulations, which were designed for large stand-alone infrastructure projects and did not therefore meet the needs of the non-project (or program procurements) and smaller value, less complex project procurements. This new move towards adaptability means that the Bank will permit the use of country systems, where it sees that an acceptable standard of procurement will be achieved, even if the country’s approach and legal and administrative tradition differs from the Bank’s.

One area of Bank procurement that is not affected by the review is the legal remedies of the Bank in relation to procurement as well as the Bank’s approach to preventing and sanctioning fraud and corruption in Bank financed

46  Approach paper, para. 5
49  See A New Framework.
54  A New Framework, page 6
projects.\textsuperscript{56} This is possibly as a result of the fact that most of the changes to the Bank’s procurement policy and guidelines between 1994 and 2011 focused on changes, amendments and supplantations to the Bank’s approach to fraud and corruption and as a result, further changes are not as yet required in this area.

The review of Bank’s procurement policy is far from over. In 2014, it is intended that phase II of the review would commence which would articulate the new proposed framework into a fuller strategy for how the Bank would support client procurement performance and would provide the outline of a new statement of procurement policy.\textsuperscript{57} This phase will address implementation issues and include more consultation with stakeholders and lead to the preparation of a detailed policy proposal, which will be presented to the Bank’s Executive Directors for approval in 2015 and the policy launched thereafter.\textsuperscript{58}

IV. IMPLICATIONS OF THE PROPOSED PROCUREMENT POLICY

As has been discussed above, the proposed changes to the procurement policy evidences a step change for the Bank in relation to its procurement policy, approach, organisation and arrangements and will have implications for the way the Bank thinks about, organizes and conducts its procurement in future. Some of the areas that will be most affected include the Bank’s approach to risk assessment as there is going to be a focus on high risk and high value contracts; the Banks staffing, as Bank procurement staff will move from reviewers of contract documentation to trainers and partners; and Bank understanding of capacity development in Borrowers in relation to the use of country systems. The all pervading nature of these changes mean that it is likely that the Bank itself does not realize just how many variations will be wrought and will be required until it fully adopts and begins to implement the new procurement policy. This makes it pertinent that a sufficient period of transition be granted to Bank clients, Bank staff and contractors in relation to the changes.

Some of the more salient implications for the Bank’s proposed changes to its procurement policy are outlined below:

i. Procurement arrangements must be “fit for purpose”: The idea of “fit for purpose” procurement is that the best outcome in relation to what is being procured should be pursued through dialogue with potential suppliers in order to generate the best overall result for the contracting agency and the users of the goods and services.\textsuperscript{59} This may be one of the most difficult concepts for the Bank to adopt and internalize, as it entails a move away from traditional procurement thinking which ensures minimal pre-contract interaction between contractors and the procuring agency in order to minimize the risks of corruption and collusion in the procurement process. Knowledge sharing and dialogue between potential contractors and the procuring agency can enhance outcomes in relation complex contracts, where research and development or innovative solutions are required. Enhanced dialogue is already a feature of procurement regulations in other contexts such as the “competitive dialogue” procedure in the EU procurement directives.\textsuperscript{60} It will be interesting to see how the Bank will ensure that a similar procedure in the Bank context does not lead to abuse by Bank clients.

ii. Value for money: The concept of value for money in public procurement regulation is hardly new, but it has transformed from a concept that pursued the least-cost procurement to a concept that is focused on the life-cycle costs of the procurement and not just the cost or purchase price.\textsuperscript{61} Although the Bank has traditionally permitted the consideration of factors beyond the cost price for Bank-funded procurements, anecdotal evidence suggests that most Borrowers would focus on price in Bank-funded projects to ensure that they do not fall afoul of the Bank guidelines. However, the Bank now seeks to make the determining factor in evaluating bids for Bank-funded projects “the optimum combination of whole-life costs and

\textsuperscript{56} A New Framework, page 14.
\textsuperscript{57} A New Framework, page 16.
\textsuperscript{58} A New Framework, page 16.
\textsuperscript{59} Initiating Discussion paper, page 21.
\textsuperscript{61} Initiating Discussion paper, page 21.
benefits. This will be very difficult for the Bank to achieve, especially where Borrowers lack capacity in the area of procurement and supply chain management. This is because determining whole life cycle costs and benefits necessarily includes an assessment of factors such as maintenance cost; management costs; operating costs; the costs of disposal of goods (where appropriate) and the implications of risks and flexibility throughout the entire life cycle. Although value for money is conceptually a good idea, its implementation in practice may prove difficult as the inclusion of more subjective factors in public procurement always increases the scope for the abuse of discretion.

iii. Supporting clients in pursuing sustainable procurement goals: The issue with this new policy thrust will be to determine the scope and the level of support that the Bank will be able to provide to its clients. It must be stated that at present, the Bank provides some level of support to its clients inter alia through “implementation support missions” to clients. These meetings are often helpful in distilling the areas where Bank clients are having difficulty following Bank procurement guidelines; clarifying the objectives and outcomes for a Bank funded project and highlighting issues that Bank clients may be facing with Bank procedures for withdrawal and retirement of funds. However, it seems likely that the Bank wants in the future to provide a greater level of support to clients to ensure that procurement goals are met. At present, implementation support missions are very process oriented and can focus on ensuring compliance with Bank regulations. It will be interesting to see whether the Bank will adopt a more flexible approach to ensuring its clients meets their goals, even if this comes at the risk of less than perfect compliance with Bank procedures. It must be noted that the Bank desires not only to provide further and where required “hands-on” support in relation to Bank-funded procurements, but more generally in relation to domestic procurement. Thus, there is an indication that the Bank will devote more resources to its clients to assist them in improving their public procurement regimes by “filling gaps, streamlining their procedures and processes, overcoming bottlenecks, and providing more support for capacity building and professionalization”. The second issue that will arise with this policy thrust is the implications for Bank procurement support staffing. At present, the Bank has about 220 full-time procurement staff in its offices worldwide. Increasing the level of support to Bank clients worldwide may entail an increase in the numbers of procurement staff and of course an increase in the capacities of existing staff. This will not necessarily be easy, given the vast range of clients, contracts and sectors that the Bank deals with.

iv. Providing leadership in public procurement: The Bank has long considered itself the global leader in relation to procurement best practices, and wants to ensure that it maintains this leadership role. Innovations such as the Country Procurement Assessment Reports (CPARs) and the Methodology for Assessment of National Procurement Systems (MAPS) have ensured that in the area of procurement reform, the Bank indeed does have a leading role. However, it must be stated that direction in the area of procurement reform is not the sole preserve of the Bank and the United Nations Commission on International Trade Law (UNCITRAL), which was established in 1966 to further the progressive harmonization and modernization of the law of international trade by promoting the use and adoption of legislative and non-legislative instruments in key areas of commercial law, including procurement is widely regarded as providing a globally acceptable template for countries which wish to reform or develop procurement regulation for the first time. For the Bank to maintain relevance in the area of procurement,
it will need to stop considering procurement through the narrow prism of Bank-funded projects. This is a radical change from current Bank operations and the thinking of Bank staff and may raise conflicting priorities that will need to be addressed as time goes on. As has been discussed above, Bank regulation of procurement developed from a desire to ensure that the Bank met its fiduciary obligations as expressed in its Articles of Agreement and that Bank loans were judiciously used for their intended purpose. However, of course, procurement is a strategic function that can ensure that countries meet their developmental aspirations. The Bank has already realized this in its newly articulated vision statement, but it must in practice ensure that in rewriting its new guidelines and in providing support to clients, the goal is not merely to ensure that Bank funds are properly used.

V. CONCLUSION

This draft working paper is an attempt to examine in detail the proposed salient changes to the Bank’s procurement policy as well as the evolving nature of the Bank’s procurement policy and distill the implications for the Bank. A comprehensive review to Bank procurement is long overdue as the Bank has essentially maintained the same approach to its procurement policy since its establishment, despite changes in the nature of the Bank’s lending, projects and clients; evolutions in procurement methods; innovations in relation to e-technologies; the trend towards harmonization of procurement practices and regulation; and other changes such as the increasing move towards public-private partnerships, outsourcing and the use of concessions. When and if the policy eventually comes to fruition, it will involve a radicalization of the approach to procurement that has been adopted by the Bank since its inception. If implemented, the new policy will bring about significant changes to the arms-length nature of procurement interactions between potential contractors and procuring agencies; a change to bid evaluation methods to take life cycle costs into account in order to achieve value for money; changes to Bank staffing requirements in procurement to provide more support to Bank clients and a more holistic approach to public procurement to ensure that the Bank maintains its leadership role.

It is hoped that the policy will be fully developed and implemented during 2015 as stated.\(^{70}\) Given the extensive nature of the proposed reforms, there is a fear that the Bank may realize that it has bitten off more than it can chew and the reforms may never be fully implemented, as was the case with the extensive reforms that were proposed in 1997, which did not have the desired or a sustained impact on Bank procurement.\(^{71}\)

\(^{70}\) A New Framework, page 16.
\(^{71}\) Initiating Discussion paper, pages 4-5.
Public-Private Partnerships for Transportation Infrastructure:
Challenges for State and Local Government Public Procurement in the United States

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ABSTRACT (06/03/14)
Decades of failing to adequately maintain the transportation infrastructure (e. g., highways, roads, bridges, tunnels, etc.) of the United States (US) has resulted in a crisis of major proportions. The American Society of Civil Engineers rates the condition of transportation infrastructure in the United States as “mediocre” to “poor.” US state and local governments suffer from a perfect storm of deteriorating transportation infrastructure, increased demands and no money. A partial solution to this crisis may be the greater use of a special type of public-private partnership (P3) called design-build-finance-operate-maintain (DBFOM). In DBFOM P3s, the private sector provides a large portion or all of the upfront capital required to construct new, or rehabilitate existing, transportation infrastructure. This article first defines P3s and presents a taxonomy of transportation infrastructure P3s. Three case examples of DBFOM P3s are then presented that demonstrate how states have successfully leveraged private sector funding for transportation infrastructure projects. Next, US state transportation infrastructure P3 enabling legislation is reviewed focusing on six key policy issues. Finally, the challenges that DBFOM transportation infrastructure P3s represent for public procurement are identified and discussed.

Keywords: Public-private partnerships, P3s, DBFOM, transportation infrastructure

INTRODUCTION
On Saturday May 25, 2013, a 60 foot section of a 58 year old bridge over the Skagit River north of Seattle in the US state of Washington collapsed. As the New York Times reported the collapse: “underscored the vulnerability of a transportation system that hinges not just on high-profile water crossings and tunnels, but on thousands of ordinary and unremarkable components that travellers mostly take for granted.” [1] Decades of failing to adequately maintain the US transportation infrastructure (e. g., highways, roads, bridges, tunnels, etc.) has resulted in a crisis of major proportions. The American Society of Civil Engineers (ASCE) rates the condition of US transportation infrastructure as “mediocre” to “poor.” [2] The ASCE estimates that it will cost as much as US$3.6 trillion to bring US transportation infrastructure up to “good” condition. [2] Where will the funding come from? Despite some recovery from the Great Recession of 2008, US state and local governments continue to face revenue challenges. [3-4] Consequently, a number of US state and local governments are looking closely at a new revenue source: the private sector. Some US state and local governments have successfully leveraged private sector capital for transportation infrastructure projects using public-private partnerships (P3s) and in particular one specific type of P3 called “design-build-finance-
operate-maintain” (DBFOM). In DBFOM P3s, the private sector provides part or all of the upfront capital required to construct new, or rehabilitate existing, transportation infrastructure.

WHAT IS A PUBLIC-PRIVATE PARTNERSHIP?

The National Council for Public-Private Partnerships (NCPPP) in the US defines a P3 as, “a contractual agreement between a public agency (federal, state or local) and a private sector entity. Through this agreement, the skills and assets of each sector (public and private) are shared in delivering a service or facility for the use of the general public. In addition to the sharing of resources, each party shares in the risks and rewards potential in the delivery of the service and/or facility.” [5]

A public-private partnership (P3) is perhaps best thought of as an “umbrella term” that includes a number of different approaches to involvement of the private sector in transportation infrastructure projects. P3s can take many forms. Some of the more common P3s forms are shown in Table 1.

Table 1- Types of Public-Private Partnerships (P3s)

<table>
<thead>
<tr>
<th>Type of P3</th>
<th>Description</th>
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<tr>
<td>Operations &amp; Maintenance (OM)</td>
<td>the private sector partner operates and maintains a transportation asset, the government partner owns the asset.</td>
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<tr>
<td>Design-Build (DB)</td>
<td>the private partner both designs and builds a transportation asset, the government partner provides the funding and owns and operates the asset or facility.</td>
</tr>
<tr>
<td>Design-Build-Operate (DBO)</td>
<td>the private partner designs, builds and operates a transportation asset, the government partner provides the funding and owns the asset or facility.</td>
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<tr>
<td>Design-Build-Operate-Transfer (DBOT)</td>
<td>the private partner designs, builds and operates a transportation asset and transfers ownership to the government partner.</td>
</tr>
<tr>
<td>Build-Transfer-Operate (BTO)</td>
<td>the private partner constructs a transportation asset and transfers title to the government partner. The public partner then leases the asset or facility to the private partner under a long term contract.</td>
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<tr>
<td>Build-Own-Transfer-Operate (BOTO)</td>
<td>the private partner builds, owns and operates a transportation asset for a period of time at which point ownership is transferred free of charge to the government partner.</td>
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<tr>
<td>Design-Build-Finance-Operate-Maintain (DBFOM)</td>
<td>the private partner designs, builds, finances, operates and maintains for a period time (e.g. 30 to 50 years or more), a transportation asset; the private sector partner covers its operating and debt service costs as well as its profit through the imposition of tolls, availability payments or some combination.</td>
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While outside the scope of this paper, it is nevertheless important to note that in the US P3s are not restricted to just transportation projects, but can include other types of infrastructure including: schools, hospitals, water and wastewater and others.

THE BENEFITS OF DBFOM TRANSPORTATION INFRASTRUCTURE P3S

The potential benefits of transportation infrastructure P3s are said to be numerous. Among the benefits most commonly mentioned by US state and local governments are: accelerated construction time, on-time and on-budget delivery of transportation infrastructure, cost savings through the bundling of design, construction,
operations and maintenance and access to new sources of financing. [6] It is this last potential benefit (new sources of financing) that has attracted the attention of many US state and local governments.

The Structure of Transportation DBFOM P3s

What distinguishes a transportation DBFOM project from other transportation infrastructure P3s is its financing component. DBFOM P3s utilize a form of financing that is unlike either traditional public financing or corporate financing. DBFOM P3s use what is called project financing, also referred to as limited recourse financing. [7] In this type of financing, private sector investors provide the required capital and recover their investment plus a profit from the cash flow and earnings generated by the transportation infrastructure asset. The cash flow and earnings come from user fees, tolls, government payments or some combination. DBFOM P3s generally involve long term contracts (30 - 50 years or longer). Long term DBFOM P3 contracts are necessary in order for the private sector to recover its capital costs and earn a profit without user fees or tolls being raised to politically unacceptable levels. The use of project financing has been credited with facilitating the construction of large new public transportation infrastructure projects costing billions of dollars that otherwise might not have been undertaken. [8]

Special Purpose Vehicle

To facilitate DBFOM transportation infrastructure P3s, a “special purpose vehicle” (SPV) is usually created. A SPV is a separate private sector corporate entity created for the sole purpose of managing all aspects of a single DBFOM transportation infrastructure P3 from financing to design and construction to operations and maintenance (Figure 1). The SPV becomes the private sector partner. A separate SPV is usually created for each individual transportation DBFOM P3. The rationale is that a SPV should have no competing priorities. The SPV operates and maintains the transportation infrastructure asset or facility usually through sub-contractors.

Figure 1 – A Typical Special Purpose Vehicle (SPV)

The SPV arranges the project financing through a combination of equity and debt. [9] However the project financing may also include government grants and loans and government guarantees. Debt is usually provided by banks, financial institutions, pension funds or from capital markets. Equity contributions usually constitute 10% to 20% of the total required capital. [7] However, since the onset of the great recession of 2008, the ratio
of equity to debt has been increasing. Equity is generally provided by financial institutions, the SPV itself and its sub-contractors (e.g., architectural firms, construction firms, others). [10]

DBFOM TRANSPORTATION INFRASTRUCTURE P3S: THREE CASE EXAMPLES

Perhaps the best way to understand exactly how DBFOM transportation infrastructure P3s work, particularly the financing aspects, is to look at some case examples. The following three case examples deal with: (1) the Port of Miami Tunnel, (2) the I-495 Capital Beltway and (3) the Texas State Highway 130 (SH-130).

Case Example #1 - Port of Miami (Florida) Tunnel

The Port of Miami is one of the busiest in the US. As many as 1,500 cargo ships dock at the port in any given year and 4 million plus travellers pass through it. The Port of Miami actually sits on an island. To get to the port, an estimated 26,000 vehicles per day are forced to utilize the City of Miami’s surface streets. [11]

The Florida Department of Transportation (Florida DOT) has entered into a transportation infrastructure P3 project with “MAT Concessionarie LLC” to design-build-finance-operate-maintain (DBFOM) a tunnel that will connect the Port of Miami with interstate highways I-95 and I-395. The MAT Concessionaire LLC is the special purpose vehicle. Once completed and open for business, the tunnel will relieve congestion on the city of Miami’s surface streets.

The total cost of design and construction of the tunnel is estimated at US$903 million. The private sector partner contributed US$80 million in equity and helped arrange the remainder of the financing in the form of debt. Once the tunnel is open to traffic, all operating and maintenance costs will be paid by the State of Florida. The Florida DOT will collect container and passenger fees (user fees) to provide the revenue stream to fund the ongoing operations, maintenance and debt service of the P3 project.

Construction of the tunnel began in May 2010 and completion is expected by May of 2014. Operational control of the tunnel will pass to the Florida DOT at the end of the P3 contract term in October 2044. [11-12] President Barack Obama held a news conference in April 2013 in Miami using the Port of Miami Tunnel project as a backdrop to discuss the US transportation infrastructure crisis and public-private partnerships. [13]

Case Example 2 - I-495 Capital Beltway

In 2007, the Department of Transportation of the state of Virginia (Virginia DOT) entered into a DBFOM transportation infrastructure P3 project with a private sector partner (Fluor & Transurban) to expand the I-495 Capital Beltway (highway) around Washington, D.C. The project was needed to relieve traffic congestion that was costing the local economy an estimated US$5.5 billion per year. [14]

The cost of the I-495 Capital Beltway P3 project is some US$2.1 billion. The private sector partner contributed US$368 million in capital. The remainder of the financing is comprised of government bonds and loans under the provisions of the US federal government’s “Transportation Infrastructure Financing & Innovation Act” (TIFIA). The contract term is for 80 years. [15]

The I-495 Capital Beltway expansion opened in 2012 and consists of 12 lanes. Eight lanes are general purpose and four are high occupancy toll (HOT) lanes. Toll charges on the I-495 Capital Beltway vary depending on
the time of day and the amount of congestion on the roadway and generally run from a low of US$3 to a high of US$6 during rush hour traffic. [14-15]

Case Example #3 - Texas State Highway 130 (SH-130)

In 2008, the Department of Transportation of the state of Texas (Texas DOT) entered into a DBFOM transportation infrastructure P3 for two extensions (segments 5 and 6) to Texas State Highway 130 (SH-130). The special purpose vehicle is the “H130 Concession Company LLC,” a consortium owned 65% by Cintra and 35% by Zachry Construction. The cost of the P3 project was some US$1.36 billion and involved no capital contributions on the part of the State of Texas. The private sector partner contributed US$200 million in equity plus a contingency commitment of an additional US$30 million. The remainder of the funding came from a group of 5 European banks and from a federal government loan. The P3 contract runs for 50 years. The private sector partner collects tolls to be used to cover operations and maintenance costs and debt service. Over the life of the P3 contract, the State of Texas will receive an estimated US$125 million in payments from the private sector partner. [16-18]

The roadway opened to traffic in November 2011. In 2013, the speed limit on SH-130 was increased to 85 miles per hour at the request of the private sector partner who paid the State of Texas an additional US$100 million for the change [16-18]

STATE P3 ENABLING LEGISLATION

According to the National Conference of State Legislatures and the Federal Highway Administration of the US Department of Transportation, thirty three (33) of the fifty (50) US states have adopted some sort of P3 enabling legislation. [19-21] This legislation applies to transportation infrastructure projects including DBFOM and in some instances to other infrastructure types such as: schools, hospitals, water/wastewater and others (see Table 1). Most of this state enabling legislation has been passed in the last few years.

The existence of state enabling legislation is considered essential by both the USDOT as well as the NCSL if a US state or local government is serious about accessing private sector funding. State enabling legislation is said to provide a public statement that transportation infrastructure P3s, including DBFOM, have been the subject of favourable public policy debate. The existence of state enabling legislation is also said to help create a stable environment for private sector investment.

A variety of organizations and individuals have monitored the adoption of state P3 legislation. [12, 20-25] This research has identified several key policy issues including: type of authority, unsolicited proposals, availability payments and shadow tolls, lower level authority, prior legislative approval and non-compete clauses.
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<th>Unsolicited Proposals</th>
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Type of Authority

The type of authority delegated in state P3 enabling legislation can be classified as either broad or restricted. Restricted authority means that the state legislature has only authorized the use of transportation infrastructure P3s for a small number of pilot or demonstration projects.

Unsolicited Proposals

An unsolicited proposal is one that is not submitted by the private sector in response to a traditional government procurement. The idea behind unsolicited proposals is to allow the private sector to propose transportation infrastructure projects (including DBFOM) that a state or local government may not have considered.

Availability Payments & Shadow Tolls

Some state P3 enabling legislation allows for the use of “availability payments” and/or “shadow tolls.” An availability payment is when a state or local government makes payments to the private sector partner when the P3 project is available and accessible to users. A shadow toll is when a government makes payments to a private sector partner on behalf of users. For example, a state or local government might pay a shadow toll of $3 to a private sector partner every time a vehicle uses a P3 highway. Availability payments and shadow tolls can be used to lower the cost of tolls making their imposition more acceptable. Also, tolling can reduce vehicle use of a DBFOM transportation infrastructure P3 project, which in turn, can have negative implications for revenue generation. In such cases, availability payments and/or shadow tolls represent an alternative method of revenue generation. The Florida DOT, for example, decided to utilize availability payments for the Miami tunnel due to concerns that tolling might reduce vehicle use and thus defeat the primary purpose of the P3 project which is to divert traffic away from Miami surface streets.

Lower Level Authority

Some state P3 enabling legislation applies only to state departments and agencies; other state legislation also applies to local governments (e.g., cities, counties, others).

Prior Legislative Approval

Some state P3 enabling legislation requires the state legislature to grant “prior legislative approval” before an individual P3 project may be implemented. Prior legislative approval can be either ex-ante or ex-post. Ex-ante approval means that a state legislature “green lights” an individual transportation infrastructure P3 project (including DBFOM) up front before the public procurement process begins. Ex post approval means that a state legislature reserves the right to intervene in a transportation infrastructure P3 project in the latter stages, even after the public procurement process has been initiated.

Non-Compete Clause

A non-compete clause is where a transportation P3 contract includes a provision restricting the government’s ability to construct new transportation projects that might affect the utilization of the P3 project and thus jeopardize its revenue generating potential. Non-compete clauses are favored by the private sector because they help protect the revenue potential of a P3 project and thus its financial viability.
CHALLENGES OF DBFOM TRANSPORTATION INFRASTRUCTURE P3S FOR PUBLIC PROCUREMENT

A majority of US states have adopted transportation infrastructure P3 enabling legislation, including DBFOM. In addition, a majority of states with P3 enabling legislation make provision for lower level authority as well as unsolicited proposals. Consequently, it seems reasonable to predict that many US state and local government procurement professionals will, at some point in the not too distant future, have a close encounter with transportation infrastructure P3 projects including DBFOMs. US state and local government procurement professionals are thus put on notice that at any future time their respective elected officials, and in the case of unsolicited proposals any private sector firm, can initiate a transportation infrastructure P3 project including DBFOM. State and local government procurement professionals are also put on notice that in those states with ex-post prior legislative authority, politics may play a greater role in the selection of private sector partners than might otherwise be the case.

When it comes to DBFOM transportation infrastructure P3s, public procurement professionals are being asked to contract for new, highly complex and expensive projects without much training or guidance and with procedures, processes and tools designed for other purposes. Several challenges can be identified that public procurement professions are encountering, and will continue to encounter, until US state and local government policymakers come to the realization that DBFOM transportation infrastructure P3s represent a new type of relationship between the public and private sectors. In the following sections three of the most important challenges are discussed including: (1) the partnership nature of DBFOM transportation infrastructure P3 projects, (2) DBFOM transportation infrastructure P3s as non-standard public procurements, and (3) the long term contractual nature of DBFOM transportation infrastructure P3s.

In addition to identifying and discussing these three major challenges, this section also describes how other countries have dealt with them. While P3s in general, and DBFOM transportation infrastructure P3s in specific, are still relatively new to the US, other countries (e. g., Australia, United Kingdom & European Union) have used them for some time now. Turning to the experience of other countries may provide insights and some direction as to how US state and local governments might approach these challenges.

The Partnership Nature of DBFOM Transportation Infrastructure P3s

The partnership nature of DBFOM transportation infrastructure P3s place them in a new and different position on the continuum of public sector/private sector relationships in the US. DBFOM transportation infrastructure P3 projects are something more than public procurement, but less than total private provision (see Figure 2). The US federal government recognizes partnership arrangements and the use of what are called “cooperative agreements” under the Federal Grant & Cooperative Agreement Act. [26] US state and local government public procurement policies, however, generally do not recognize the concept of partnerships. State and local government procurement policies are predicated upon a buyer/seller relationship. Part of the selection process for DBFOM P3s involves decisions about essentially going into business with a private sector entity for an extended period of time.
The finance component also sets DBFOM transportation infrastructure P3s apart from traditional US state and local government procurement policies based on buyer/seller relationships. Traditional US state and local government procurement policies are inadequate when the private sector is being asked to help address public transportation infrastructure needs and to also provide the necessary funding.

DBFOM Transportation Infrastructure P3s as Non-standard Public Procurements

From an implementation perspective, several aspects of the DBFOM transportation infrastructure P3 projects likewise do not fit neatly into how US state and local governments conduct their procurement processes. US state and local government infrastructure projects are generally: procured individually, involve the use of requests for proposals (RFPs), request for qualifications (RFQs) or some combination, allow for progress payments during the construction phase, and do not involve unsolicited proposals. International best practices suggest that DBFOM transportation infrastructure P3s should be handled differently and when necessary should include: bundling, alternatives to RFPs and RFQs and no progress payments. [10]

Bundled Procurements

International best practices in DBFOM transportation infrastructure P3s suggest that larger projects are preferable to smaller ones. The rationale here is that smaller projects are not cost effective owing to the transaction costs involved with DBFOM transportation infrastructure. As a rule of thumb, international best practices suggest that a DBFOM transportation infrastructure P3 project should involve anticipated costs of at least US$100 million. [27] An additional consideration is that DBFOM transportation infrastructure P3s projects of less than US$100 million may be too small to be attractive to private sector investors. Bundling several smaller transportation infrastructure projects into one DBFOM P3 is one method to reach the minimum cost threshold.

Alternatives to RFPs and RFQs

Because of the unique challenges created by the financing components, traditional requests for proposals (RFPs) and requests for qualifications (RFQs) may be insufficient to deal adequately with DBFOM transportation infrastructure P3s. International best practices, and in particular the policies and practices of the European Union (EU), suggest that concurrent negotiations with different private sector firms conducted over a period time may be necessary for the government to determine which proposed financing approach represents best value for money. The EU has identified a relatively new and substantively different procurement approach that is recommended for use in DBFOM transportation infrastructure P3 projects called “competitive dialogue.” [28] Competitive dialogue is a multiphase procurement process that allows concurrent discussions and negotiations with multiple contractors. [29]
No Progress Payments
Owing to the significant costs (US$ 1 billion or more) involved with many transportation infrastructure projects, US state and local government procurements have traditionally allowed for progress payments to be made during the construction phase. International best practices in DBFOM transportation infrastructure P3s suggest that no payments of any kind should be made to the private sector partner before and until the P3 project has been constructed/rehabilitated and is available for use by the general public. [10] Tying payments to availability is said to act as an additional incentive for the private sector to deliver the DBFOM transportation infrastructure P3 project on time and on budget. [30]

Long Term Contracts
DBFOM transportation infrastructure P3 contracts generally run for 30 to 50 years and some can involve contract terms of close to 100 years. Long term contracts of this nature present several problems for public procurement. How does one design and develop a contract that is to cover a term of 30, 50 or even 99 years? International best practices suggest that DBFOM transportation infrastructure contracts should be classified as “incomplete contracts” and treated accordingly. [31] Following this logic, DBFOM transportation infrastructure P3 contracts would be: more flexible, reviewed and recalibrated periodically, include recognition and provisions for continuing dialogue and negotiations and be performance-based with more emphasis on outputs and outcomes. [9, 26]

SUMMARY & CONCLUSION
The challenge for US state and local governments going forward is how to finance the $3.6 trillion needed according to the American Society of Civil Engineers to bring the nation’s “poor” and “mediocre” transportation infrastructure up to “good” condition. [2] One proposed solution is through the greater use of public-private partnerships (P3s) and in particular design-build-finance-operate-maintain (DBFOM) P3s where the private sector provides part or all of the necessary funding.

This paper has discussed DBFOM transportation infrastructure P3s and identified some major implications for US state and local government procurement and public procurement professionals. Transportation infrastructure P3s, and in particular DBFOM P3 projects, are outside the mainstream of traditional public procurement practices. Because of such challenges as the partnership relationship, the funding approach and long term contracts (30, 50 100 years), DBFOM transportation infrastructure P3s require new thinking and new procurement policies and tools. Going forward, US state and local government procurement professionals need to become grounded in transportation infrastructure P3s in general and DBFOM projects in particular. To this end, some international best practices were identified and discussed.

REFERENCES


THE EFFECTS OF FAVORITISM ON TENDERING SYSTEMS IN JAPANESE LOCAL GOVERNMENTS

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ABSTRACT

Since the 1990s, Japanese tendering systems for public works have experienced drastic reforms due to criticism to many exploded bid-rigging cases. However, focusing on the local governments (prefectures), we observe that their responses to the reform of their tendering system are much dispersed. Especially, to the adoption of the price auction with public invitation which permits procurers’ discretion, on one hand some prefectures positively restrain the use of it, on the other hand others take negative stance to suppression of this tendering system. Based on the discussions in auction theory, we examine why this types of different stance occurs. Especially, we focus on favoritism of the local governments and clarify that favoritism plays an important role to the choice of tendering system. That is, it is clarified that the incentive to adopt price competition with public invitation depends on the growth rate of construction firms located in the territory and the competitiveness among bidders in the prefecture. In addition, this hypothesis is confirmed by using very simple econometric methods.
1. INTRODUCTION

Needless to say, building activities, such as construction of buildings, roads, and bridges, occupy an extremely important position in national economies. In many countries, the construction industry promotes significant value addition and employment, and plays an important role in the economy. Since the contractor of these activities relate to public works are determined by the auctions conducted by the public sector, it is important to clarify the nature of them. Actually, the public procurers adopt various tendering system according to the nature and the scale of an offered item. However, as we will observe in the next section, the choice of the tendering systems by the procurers (esp. local governments) sometimes seems to have a systematic bias.

While since the 1990s Japanese tendering systems for public works have experienced drastic reforms due to criticism to many exploded bid-rigging cases, the responses of Japanese prefectures to the reform of their tendering system are much dispersed. Especially, to the adoption of the price auction with public invitation which permits procurers’ discretion, on one hand some prefectures positively restrain the use of it, on the other hand others take negative stance to suppression of this tendering system. Based on the discussions in auction theory, we examine why this types of different stance occurs. Especially, we focus on favoritism of the local governments and clarify that favoritism plays an important role to the choice of tendering system.

This paper is organized as follows. In the next section, we explain the Japanese tendering systems and their general transition. In Section 3, we examine the role of favoritism on the choice of the tendering systems by prefectures. In there, we clarify that the incentive to adopt price competition with public invitation depends on the growth rate of construction firms located in the territory and the competitiveness among bidders in the prefecture. In section 4, this hypothesis is
examined by using very simple econometric methods. Finally, Section 5 concludes the paper.

2. JAPANESE TENDERING SYSTEM AND ITS TRANSITION

Japanese tendering system which is legally based on the Japanese Accounting Law is classified into three types of competitive tendering. First type is the normal competitive tendering (first-price sealed-bid auction) in which a contract for an offered object is awarded to a winner of the auction. In there the winner is determined by free and fair competition among entitled participants. Second type of competitive tendering is the scored (multidimensional) auction (sohgo-hyoka in Japanese). In this tendering system a winner is determined by the total score which reflects both price and non-price attributes (quality). The total score of each bidder is calculated by a predetermined scoring rule which a procurer adopts in order to improve the quality of a procured item while maintain the reasonable price. In Japan, this system was introduced by the enforcement of Act on Promoting Quality Assurance in Public Works in 2005 and gradually become pervasive among various public procurers. Third type is the competitive tendering by public invitation (simei-kyoso in Japanese). Here, the government first determines participants of an auction based on its relatively discretionary procedure. After this process, first-price sealed-bid auction is carried out among the invited bidders. Although this system might be considered to be similar with the two-stage auction, it does not have a bidding process for the participation of the second-stage auction but instead depends on discretionary way of determining the participants.1)

As it is well known, in Japan two different types of bid-rigging cases, dango (bid-riggings among bidders) and kansei-dango (government-assisted or facilitated bid-riggings), have been repeatedly exposed since 1990. Such
exposures have created an awareness in Japanese society about bid-rigging in public procurement. Both types of bid-rigging are criticized in social media because they affect competitiveness in the tendering system of the public sector and cause inefficiencies in public procurement. As a result, Japanese public procurers tried to find their desirable tendering system and proceeded the reform of their tendering system. Because one of the causes of bid-rigging is considered to be the lack of competitive environment and transparency of tendering system, procurers are forced to adopt more competitive and transparent system.

As a whole, this brings drastic change of tendering type which public procurers mainly adopt. Instead of the competitive tendering by public invitation which is mainly employed by them before 1990, they tend to use simple price auction or scored auction. The ratio of the number of the competitive tendering by public invitation to total number of auction for public work is averagely decreased from 68.86% in 2007 to 45.46% in 2012. As stated before, the procedure of determining the participants of an auction in the competitive tendering by public invitation heavily depends on discretion of public procurers. In addition, this auction style often restricts competition among the participants. Table 1 shows average number of the winning bid to reserve price (2007-2012) in the three tendering system. As the result of t-test described in the table shows, this value in the competitive tendering by public invitation is significantly higher than other types of auctions. Thus, we can interpret that the nature of competition and transparency in each tendering system supports recent trend of drastic change of tendering type.
Table 1: average number of the winning bid to reserve price in the three tendering system

<table>
<thead>
<tr>
<th>Tendering System</th>
<th>Mean</th>
<th>std. dev.</th>
<th>N</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>price auction with public invitation</td>
<td>90.59</td>
<td>4.34</td>
<td>195</td>
<td></td>
</tr>
<tr>
<td>simple price auction</td>
<td>87.64</td>
<td>4.52</td>
<td>195</td>
<td>13.67***</td>
</tr>
<tr>
<td>price auction with public invitation</td>
<td>90.54</td>
<td>4.34</td>
<td>194</td>
<td></td>
</tr>
<tr>
<td>scored auction</td>
<td>87.54</td>
<td>4.40</td>
<td>194</td>
<td>13.06***</td>
</tr>
</tbody>
</table>

Source: Nikkei Construction’s survey

Note: The superscript “***” above t-value indicates that null hypothesis (average values are equal) is rejected at a 1% significance level.

In spite of the overall trend, when we focus on local governments (prefectures) as public procurers, it is observed that their choice of main tendering style extremely disperses. Figure 1 shows the histogram about the ratio of the number of the competitive tendering by public invitation to total number of auction for 46 prefectures in 2012. Obviously, on one hand some local governments positively restraint use of the price auction with public invitation, on the other hand other procurers have negative attitudes to the transition towards adoption of normal price auction and/or scored auction. Rather, their choice of the tendering system seems to be polarized. What brings this tendency? We turn to tackle this problem in the following two sections.
3. FAVORITISM IN JAPANESE TENDERING SYSTEM

What type of auction under what situation should a public procurers design? This problem which numerous researches have pursued is one of most important theme of auction theory. In the case of its benchmark model, in which it is
assumed that 1) the cost function of the participants of the auction is private information, 2) any participant’s cost is statistically independent from other participant’s cost (independent-values model), 3) any bidders are symmetric, 4) the bidders are risk neutral and 5) payment to the procurer is a function of bid alone, it is well known that simple price auction produces desirable outcomes (Vickley (1961), Riley & Samuelson (1981), McAfee & McMillan (1987)). Here, through auction, a bidder who can produce an offered item at minimum cost is not only awarded for a contract, but also the payment of a procurer is expected to be minimized. Under the situation in which a procurer does not have information about the cost of the participants, competitive mechanism among the bidders plays a very important role of mitigating the difficulties caused by the asymmetry of information between the procurer and bidders.

Under more complex situations where the quality of an offered item is critical factor as often observed in the case of procuring public work, simple price auction may not be adequate for the procurer. Even when the government can enforce the quality of the item \textit{ex post}, it faces informational asymmetry over both quality and cost of the item which each bidder can provide. However, even though this difficulty, as Che (1993) and Branco (1997) has shown, the procurer may be able to achieve the desirable outcome by designing an adequate scoring rule and by conducting a scored auction. In there, first score auction tends to bring excessive quality from procurer’s point of view because of its inferior informational position. In order to overcome this problem, the procurer should commit to its scoring rule which relatively undervalues quality of the item.\footnote{When it can successfully design this adequate scoring rule, scoring auction is also useful tendering system which is expected to produce the optimal outcome.} Beside the problems whether price auctions conducted by Japanese public procurers attain desirable outcome and they successfully design the scoring rules in their scored auction, these two types of tendering system have their economic
reason. On the contrary, price auction with public invitation as Japanese unique tendering system, which local governments in specially tends to depend on, seems not to have this sort of clear economic reasons. Then, we consider why some local governments (prefectures) adopt this tendering style.

Most significant nature of this system is discretionary selection of participants by a procurer before auction. Typically, after a public procurer plans to conduct an auction of an offered item, it selects invited bidders who are permitted to the participation of the auction from the list of entitled (potential) bidders based on its discreitional standard. Because in this tendering system the buyer are required to discriminate (favor) invited bidders from non-invited bidders, favoritism is institutionally incorporated into this system. In general, favoritism leads to inefficient outcome in public procurement: it may give negative impact on the quality of an offered item and/or lead to corruption (For example, see Celentani & Gauza (2002), Laffont & Tirole (1991)). Thus, it is necessary for the public procurer to design tendering system which reduces favoritism. Then, we consider what factors lead to favoritism in the Japanese tendering system.

First is a factor that is well known. As Laffont & Tirole (1991) pointed out, a public procurer is interpreted as an agent for the Congress or the public, although it is regarded as a principal at the same time as textbook auction theory suggests. Thus, it is enforced to consider interests of them when it plans and/or conducts to procure an item. This has two important implications when we examine the choice of the tendering style by local governments. In general, each prefecture faces different economic situations: on one hand some prefectures may experience relatively favorable economic conditions, the other hand others may face severe decline of their economy. Especially, when the economy of a prefecture has downward trend, the request of protecting its economy by its citizen is considered to be relatively strong. So, in this situation the prefecture as a public procurer has an incentive to introduce the means of protecting its economy.
in their tendering system.

When we focus on the public procurement for public works, the above discussion has another implication. Needless to say, by its procuring activities, a local government supplies various goods and services, such as roads, bridge and maintenance services of them, which is absolutely necessary to the daily life of its residents. On these types of goods and services the procurer often tend to assure construction firms which are able to supply them adequately and promptly, provided against contingencies, e.g. natural disasters. As a simple mean that achieve this assurance, it has an incentive to protect the construction suppliers located in its territory. Especially, notice that this incentive is also increased when the economy of the prefecture declines.

Second source of favoritism is based on the nature of Japanese unique tendering system. All Japanese public procurers add prices of all inputs that are necessary to produce an offered item based on its drawings and specifications in order to calculate reserve price. Importantly, in Japan information of prices of main inputs which is used by governments is published for public (it can be called as “add-up calculation system”). So, any suppliers which consider to the participation of an auction conducted by procurer are able to calculate valuation of procured item as well as the procurer. This means that the value of offered item is objectively conjectured, but that no bidders know its true value. This is just the situation which common-value model assumes. So, in Japanese tendering system its unique “add-up calculation system” contributes to move form of bidder’s valuation of the item from one described by “independent-value model” to “common-value model”.

It is well known that common-value version of simple price auction model may bring so-called “winner’s curse” in which participants of an auction aggressively bid low prices in order to become the winner of the auction (Milgrom (1981), Milgrom & Weber (1982)). Although they may bid for an offered item
considering this curse, the public procurer which has a responsibility to manage its local economy may also worry about this situation. When it concerns this risk heavily, it has an incentive to avoid winner’s curse by adopting less competitive tendering style.

The above discussions suggest that local government may select less competitive tendering system such as price competition with public invitation in order to protect the construction suppliers located in its territory and to avoid winner’s curse.

4. AN EMPIRICAL STUDY ON THE EFFECTS OF FAVORITISM ON TENDERING SYSTEM ADOPTED BY LOCAL GOVERNMENTS

In this section we examine the conjectures suggested in the previous section by using very simple econometric method. Since we are interested in the difference of the tendering systems adopted by local governments, our analysis is based on the “semi-macro” approach which focuses on the average situation of the tendering system by them, instead of concentrating the auctions conducted by one local government. 4)

Although the numerical information of the tendering system adopted by each Japanese prefecture is severely confined, we can use the data provided in Nikkei Construction’s survey. 5) This survey publishes the number of auctions (according to tendering systems) conducted in main Japanese public procurers (including all prefectures), average number of the winning bid to reserve price in each tendering style and some quality attributes of the tendering system in each procurer. Using this data and some other data source about Japanese local governments, we construct panel data about tendering system adopted by Japanese public procurers.

In the following, we analyze the effects of favoritism on the choice of the
tendering system adopted by Japanese prefectures using this panel data. As the discussions mentioned in the previous section suggests, local government tends to select price competition with public invitation when it would like to protect the construction suppliers located in its territory and to avoid winner’s curse. In general, due to favoritism, when the growth rate of construction firms located in the territory decline a prefecture’s incentive to protect them is considered to be strong. In addition to this, because of Japanese unique “add-up calculation system” the risk of winner’s curse is increased as the competitiveness among bidders in the prefecture is more severe. Thus, our hypothesis can be described by the following.

**<Hypothesis>**
The ratio of the number of price competition with public invitation to the number of auction is increased when the growth rate of construction firms located in the territory decline and when the competitiveness among bidders in the prefecture is more severe.

We shall examine this hypothesis using the following very simple equation:

\[
RATIO_i \equiv \alpha + \sum \beta_j X_{it} + \mu + \epsilon_i.
\]  

where \(i\) represents prefecture and \(t\) shows year. \(RATIO_i\) is the ratio of the number of price competition with public invitation to the number of auction of prefecture \(i\) in year \(t\), \(X_{it}\) represents the explanatory variables of prefecture \(i\) in year \(t\) explained in the following, \(\mu\) shows unobservable variables of \(i\) selected above, and \(\epsilon_i\) the error term. Considering the above hypothesis, we use the following explanatory variables.

**LOCAL:** The growth rate of construction firms located in the territory. The source of this data is Japanese Ministry of Land, Infrastructure, Transport and Tourism, *On the results of the survey on the number of...*
permitted construction firms.

COMP: Average number of the winning bid to reserve price. Its source is Nikkei Construction.

Using these data, we conduct very simple panel analysis (pooled OLS, fixed effects estimation and random effects model). Its results based on (1) are shown in Table 2. From this table, we observe that the coefficients of LOCAL, in three methods have negative values and the coefficient of COMP, also has negative values in the fixed effects model. In addition, the result of Hausman test and Breusch & Pagan test supports that fixed effects model adequately fit the data. It means that the decrease in LOCAL and/or increase in COMP increase RATIO at 1% significance level.

<Table 3> The results of Simple Econometric analysis

<table>
<thead>
<tr>
<th></th>
<th>Pooled OLS</th>
<th>Fixed Effects Model</th>
<th>Random effects model</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>const.</strong></td>
<td>-3.16</td>
<td>1.43</td>
<td>0.38</td>
</tr>
<tr>
<td></td>
<td>(-7.10***</td>
<td>(3.16**)</td>
<td>(0.87)</td>
</tr>
<tr>
<td><strong>LOCAL</strong></td>
<td>-2.74</td>
<td>-1.82</td>
<td>-1.81</td>
</tr>
<tr>
<td></td>
<td>(-2.46***</td>
<td>(-3.12**)</td>
<td>(-3.12**)</td>
</tr>
<tr>
<td><strong>COMP</strong></td>
<td>0.041</td>
<td>-0.011</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>(8.20***</td>
<td>(-2.11**)</td>
<td>(0.20)</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>224</td>
<td>224</td>
<td>224</td>
</tr>
<tr>
<td><strong>Test</strong></td>
<td>F=34.49</td>
<td>Hausman test</td>
<td>Breusch &amp; Pagan test</td>
</tr>
<tr>
<td></td>
<td>Prob&gt;F=0.00</td>
<td>Prob&gt;Chi(2)=0.00</td>
<td>Prob&gt;Chibar2=0.00</td>
</tr>
</tbody>
</table>

Note: (1) The figure in parentheses shows t-value.
(2) The superscripts *** above t-values indicate that the explanatory variable determines the dependent variable at significance levels of 1%.
Thus, it is confirmed that the above hypothesis is basically supported, although the coefficients of COMP are unstable in the pooled OLS and random effects model. Thus, the arguments described in the previous section adequately seem to explain the choice of the tendering system by Japanese local governments.

5. CONCLUDING REMARKS

In this paper, we analyze the nature of the choice of tendering systems by Japanese local governments (prefectures). Focusing on the discussions of favoritism in auction theory, we clarify that the incentive to adopt price competition with public invitation depends on the growth rate of construction firms located in the territory and the competitiveness among bidders in the prefecture. In addition, we analyze this hypothesis by using very simple statistical methods and confirm that this is supported.

Of course, the goal of the procurement policy is achievement of efficiency in the tendering system. However, it is often difficult for the prefectures to attain this goal by its favoritism. Our discussion in this paper suggests that the favoritism by Japanese local governments is based on not only their concerns about the conditions of local economy but also the roots of Japanese tendering system such as “add-up and calculation system”. In this meaning, favoritism by public procurers raises challenging problem for a society.
ACKNOWLEDGEMENTS

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EXPLANATORY FOOTNOTES

1) According to Japanese official definition, scored auction is interpreted as not tendering system but a system of determining a winner of an auction. Since in Japanese scored auction the scoring rule adopted in each auction is published before conducting the auction, we interpret this as a tendering system in this paper. For an outline of the Japanese tendering system which the national government typically adopts, see “Japanese Procurement Procedures for Public Works,” issued by the Japanese Ministry of Land, Infrastructure, Transport and Tourism [http://www.mlit.go.jp/sogoseisaku/const/kengyo/kokyo-e.htm [Retrieved January 31, 2014]]).

2) We calculate these figures based on Nikkei Construction’s survey. For this survey, see the discussion in section 4.

3) On the other hand, we should notice that the different results are obtained in different setting as Asker & Cantrillon (2010) has shown.

4) For the analysis based on this “semi-macro” approach to Japanese tendering system, see Tanaka & Hayashi (2011) and Suzuki (2004).

5) Based on this survey, we obtain some numerical data on the tendering conducted by Japanese main public procurers in 2007, 2008, 2009, 2010 and 2012.

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When Kraljic met practice

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Carr and Pearson (1999) found that strategic purchasing involved recognising the importance of reviewing and adjusting purchasing plans to match an organisation's strategic plan regularly, in which purchasing strategies need to be developed in accordance with long-range plans. Paulraj et al. (2006) demonstrated that purchasing strategy needs to be aligned with business strategy, and purchasing professionals need to be knowledgeable about the strategic direction of the firm. Moreover, purchasing strategy involves dealing with supplier selection and relationship management decisions made by industrial buyers in support of competitive activities (Watts et al. 1992; Krause et al. 2001; Terpend et al. 2011).

However, Ogden et al. (2007) explored the role of purchasing to expose three primary factors necessary for strategic sourcing; professionalism, status within the organisation and supply management. They found that specifically in the UK there is a major difficulty linking strategic planning with a pro-active and innovative role for purchasing, and purchasing is an essentially reactive role.

Procurement activities entail significant time and financial resources, but they also confer risk, consequently purchasing strategies tend to have a large influence on the overall performance of an organisation (Padhi et al., 2012). Portfolio models are established as an excellent way of organising information and can be used to classify resources or suppliers in procurement management (Olsen and Ellram, 1997; Nellore and Söderquist, 2000).

A large number of scholars have contributed to research on purchasing portfolio models by proposition of new dimensions and perspective for classification of products or suppliers (Padhi et al., 2012). Kraljic (1983) was considered by its peers as a seminal contribution and the practical guide for recognising the extent of supply weakness and for managing those vulnerabilities with a comprehensive strategy.

The Kraljic (1983) study involved a root and branch review of an organization’s purchasing function, calling for a total change in perspective from purchasing as an operational function to supply management. This would take purchasing to a strategic function in order that an organization can make things happen to its own advantage. A backdrop of noted contemporary issues were highlighted by Kraljic (1983), most of which remain relevant to most industries today; the risks and complexities of global sourcing, threats of resource depletion, political disturbance and government intervention in supply markets, intensified competition, and accelerating technological change.

Kraljics (1983) purchasing portfolio positioning and classification model appears to remain largely supported in literature. The development of purchasing strategies and supply management rely on three basic assumptions underlying this leading model;

1. A portfolio of products can be classified into one of four categories by measurement of relative expenditure against supply risk;
2. The buyer/supplier relationship can be determined by virtue of that classification,
3. The strategic direction or purchasing strategies for managing the product is determined by virtue of product positioning and the power and interdependence between buyers and suppliers for that product.

Criticism of this methodology revolves around measurement issues necessary for classification and the simplicity of the approach. Issues abound regarding whether the fundamental basis of the strategy formulation, which is the product classifications, are merely unsupported nebulous concepts, and whether the dependent variables are sufficient to capture the nuances of highly complex products, markets and processes.

KRALJICS PURCHASING PORTFOLIO MODEL

Kraljic (1983) considered that European companies devised supply strategy involving a four-phase systematic approach to purchasing involving; Phase 1 - Classification of all purchases in terms of profit impact and supply risk, Phase 2 - Analysis of the supply market for these purchases, Phase 3 - Determination of an overall strategic supply position, and Phase 4 - Development of product strategies and action plans.

To embark on Phase 1, Kraljic offered Exhibit I (Stages of Purchasing Sophistication) and Exhibit II (Classifying Purchasing Materials Requirements) for diagnosing the case and classifying purchases requirements. This forms the renowned Kraljic 2x2 matrix, set out in Figure 2. Four product categories were established, classified as Strategic, Bottleneck, Leverage and Non-critical, each requiring distinctive purchasing approaches. Following classification, Phase 2 involves systematic review of the supply market for the purpose of determining the bargaining power of suppliers against the organizations strength as a customer. Contrasting criteria for supplier and buyer strengths are set out in Kraljics Exhibit III (Purchasing Portfolio Evaluation Criteria). At Phase 3 the company positions products identified or classified as “Strategic Item” from Exhibit I in a “Purchasing Portfolio Matrix”. The Kraljic Exhibit IV (The Purchasing Portfolio Matrix) matrix positions “Strategic Items” and provides a strategic thrust for those products. The strategic thrusts for “Strategic Items” are defined as exploit, balance or diversify. Finally, Phase 4 involves developing purchasing strategies and action plans identified by Kraljic (1983) in Exhibit V (Strategic Implications of Purchasing Portfolio Positioning). Nine individual elements of the
purchasing strategy are identified, and for each of the three anticipated purchasing strategies a consequent distinctive implication is outlined.

The outcome of the Kraljic (1983) four-phase process will present a set of systematically documented purchasing strategies for critical products. Introducing the first recognized comprehensive portfolio approach for purchasing and supply management (Gelderman and Van Weele, 2003), Kraljic provided specific focus on strategic products and for other products merely formulated the main tasks (Cainls and Gelderman, 2005). Subsequent works have provided refinement of the matrix and formulated purchasing strategy recommendations for the three remaining product categories (ibid).

<table>
<thead>
<tr>
<th>LEVERAGE ITEMS</th>
<th>STRATEGIC ITEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Criteria</td>
<td>Performance Criteria</td>
</tr>
<tr>
<td>-Cost/price and materials flow management</td>
<td>-Long-term availability</td>
</tr>
<tr>
<td>Typical Sources</td>
<td>Typical Sources</td>
</tr>
<tr>
<td>-Multiple suppliers, chiefly local</td>
<td>-Established global suppliers</td>
</tr>
<tr>
<td>Time Horizon</td>
<td>Time Horizon</td>
</tr>
<tr>
<td>-Varies, typically 12-24 months</td>
<td>-Up to 10 years, governed by long-term strategic impact</td>
</tr>
<tr>
<td>Supply</td>
<td>Supply</td>
</tr>
<tr>
<td>-Abundant</td>
<td>-Natural scarcity</td>
</tr>
<tr>
<td>Decision Authority</td>
<td>Decision Authority</td>
</tr>
<tr>
<td>-Mainly Decentralized</td>
<td>-Centralized</td>
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<table>
<thead>
<tr>
<th>NON-CRITICAL ITEMS</th>
<th>BOTTLENECK ITEMS</th>
</tr>
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<tbody>
<tr>
<td>Performance Criteria</td>
<td>Performance Criteria</td>
</tr>
<tr>
<td>-Functional efficiency</td>
<td>-Cost management and reliable short-term sourcing</td>
</tr>
<tr>
<td>Typical Sources</td>
<td>Typical Sources</td>
</tr>
<tr>
<td>-Established local suppliers</td>
<td>-Global, predominantly new suppliers with new technology</td>
</tr>
<tr>
<td>Time Horizon</td>
<td>Time Horizon</td>
</tr>
<tr>
<td>-Limited, typically 12 months or less</td>
<td>-Variable, depending on availability vs. short-term flexibility</td>
</tr>
<tr>
<td>Supply</td>
<td>Supply</td>
</tr>
<tr>
<td>-Abundant</td>
<td>-Production-based scarcity</td>
</tr>
<tr>
<td>Decision Authority</td>
<td>Decision Authority</td>
</tr>
<tr>
<td>-Decentralised</td>
<td>-Decentralized, but centrally co-ordinated.</td>
</tr>
</tbody>
</table>

FIGURE 2 STAGES OF PURCHASING SOPHISTICATION ADAPTED FROM KRALJIC EXHIBIT 1 (1983)

COMPLEMENTARY PURCHASING PORTFOLIO MODELS

Opinions abound that purchasers cannot plan for every situation or rely on pre-packaged archetypes described in prescriptive portfolio purchasing models (Terpend et. al. 2011), or nebulous concepts without operational dimensions (Ramsay, 1996). Olsen and Ellram (1997) consider portfolio models tend to present strategies independent of each another, therefore should be applied in understanding of their limitations and in combination with other tools. The application of portfolio models involves significant risk insofar as the implications for suppliers and operational staff are scarcely considered (Nellore and Söderquist, 2000). Furthermore differing dimensions are merely approximate estimations of the parameters to be measured.

In consideration of the limitations within the Kraljic purchasing portfolio approach, alternative and complementary solutions have been offered. In chronological order those complementary contributions examined herein includes 1) Olsen and Ellram (1997), 2) Bensaou (1999), 3) Nellore and Söderquist (2000), 4) Saccini and Ferona (2007), and 5) Terpend, Krausse and Dooley (2011).

Olsen and Ellram (1997) presented a three-step approach towards developing a portfolio model to assist in managing supplier relationships. Their proposed portfolio model approach involves (i) adopting a normative approach to analyse the purchasing portfolio to determine ideal relationship types for major purchases, (ii) evaluate the existing supplier relationships to determine how the supply task is presently managed (iii) generate an action plan illustrating how to adjust existing supplier relationships by comparing the ideal relationship type to the actual supplier relationship.

The initial determination of the ideal relationship type is similar to Kraljic (1983), insofar as Olsen and Ellram (1997) present identical classifications in a four-quadrant portfolio model of relationship types. This portfolio models' classification dimensions differ by mapping difficulty of managing the purchasing situation against the strategic importance of the purchase as opposed to the purchasing importance and supply risk. Analysis of the existing supplier relationship is determined by measuring relative supplier attractiveness against the strength of the relationship, illustrating current allocation of resources. This involves analysing factors influencing the relative supplier attractiveness against a set of factors describing the strength of the relationship. Final analysis outlines nine potential scenarios, which will determine the necessary action to adapt existing relationships to the ideal situation.
Olsen and Ellram (1997) recognised the relatively complex dimensions proposed in their relationship based portfolio model approach and potential problems associated with implementing their portfolio model. They suggested that their relationship based portfolio model permits room for less complicated measures to be applied.

Bensaou (1999) further suggested managing a portfolio of relationships. Contrary to the prevailing opinion regarding the importance of strategic partnering, Bensaou (1999) questioned the mythical link between long-term collaborative strategic partnerships and competitive advantage. He considers such arrangements risky and costly to develop, nurture and mature. In his empirical study of US and Japanese automobile manufacturers, Bensaou (1999) discovered the naturally occurring variables which interacted to create effective supplier relationships involved the level of specific investment made by each party to the relationship. Four contextual profiles were developed for buyer/supplier relationships. Relationship based purchasing portfolio classifications include Strategic Partnership, Captive Buyer, Captive Supplier and Market-Exchange.

Managing this classification ultimately contributes to two forms of successful relationship; high requirement/high capability or low requirement/low capability; and two potentially unsuccessful relationships forms; under designed relationships and over designed relationships, based on requirements and capabilities. The relationship-based portfolio was established for effective supply chain management by choosing a relationship type appropriate to product type and market conditions.

Nellore and Södorquist, (2000) outlined that the inherent commonality within purchasing portfolio models was the three-step approach involving (i) product analysis and classification, (ii) analysis of the supplier relationship required to deliver the product and (iii) an action plan to match the product requirements with the supplier relationship.

This approach determined product classification again in accord with Kraljic (1983). Their supplier relationship analysis presented a typology of supplier types for supplier categorisation; Partner suppliers, Mature suppliers, Child suppliers and Contractual suppliers. They further defined component types by specification generator. Nellore and Södorquist, (2000) outlined that problems in terms of the strength of the buyer/supplier relationship can be the cause of sub-optimal arrangements and consequently the supplier relationship analysis is crucial. The action plan and resultant portfolio models sets out supplier relationships classification dimensions by mapping market attractiveness against the strength of the relationship. In their study sourcing strategies are based on linking the four product categories, to the product specification generator, the supplier type and the product specification.

In dealing with low-average strength relationship involving moderate to high attractiveness Nellore and Södorquist, (2000) suggest added leverage power is essential to get suppliers to increase their attractiveness, to foster a more collaborative working atmosphere. They further suggest that the three step approach to purchasing portfolio models for strategic procurement involves expansion of the outlined three-step approach to incorporate intricate issues, which thereby increases portfolio model relevance.

In further extension of the concept of a portfolio of buyer/supplier relationships Saccani and Perona (2007) developed a contingency model of relationships. This model maps the relationships in terms of exchange criticality relative to the operational impact. The model was designed and tested for the purpose of identifying the optimum relationship suitable to the exchange context. This is on the basis that the operational impact of an exchange influences the amount and scope of interaction necessary, while exchange criticality affects the need for cooperation. This model was proposed for use within manufacturing industries for the purpose of value creation.

More recently, Terpend, Krause and Dooley (2011) sought to explore how organisations rationalise their purchasing strategies in order to empirically test the validity of the prescriptions of the existing purchasing portfolio models. Observation of the patterns emerging from buyers purchasing decisions uncovered families of purchases, to assess the potential for performance improvement by adopting the taxonomy of purchases made by buyers. Their study extracted four prevailing and distinct categories of purchases, i.) the strategic purchase, ii.) the captive buyer purchase, iii.) the non-critical purchase, and iv.) the adversarial purchase.

These findings provided some support to the prescriptions outlined in previously presented purchasing portfolio models. Kraljic’s (1983) finding for the strategic and non-critical classification were supported, alongside Bensaou’s (1999) captive buyer classification, however, a new category of product classification emerged; the adversarial purchase. The “adversarial” classification portrays a situation with high levels of mediated power, whereby buyers rely on reward, coercive and manipulative power, and the relationship reveals low levels of trust.

STRATEGIC DIRECTION IN THE KRALJIC PURCHASING PORTFOLIO

Significant research questioned the purchasing portfolio models of Kraljic (1983). Gelderman and Van Weele (2003) stated the primary uncertainties revolved around i.) measurement of variables and dimensions for product classification and portfolio analysis, ii.) the disregard of the suppliers side of the buyer-seller relationship, iii.) selection of strategies based upon two basic dimensional factors, iv.) limited and deterministic character of the strategic recommendations, v.) absence of direction for movement within the matrix. This study by Gelderman and
Van Weele (2003) was based on an in-depth case studies examination of three experienced practitioners, which revealed that there existed in industry effective solutions to those problems. Regarding issues around the measurement of variables three distinctive methods were evident; i.) the consensus method, ii.) one-by-one method and, iii.) weighted factor score method; each satisfying the needs and expectations of their user. A further process of reflection and interpretation is conducted prior to engaging in strategic actions.

As regards deducing strategies based on two-dimensional factors, experienced practitioners did not merely regard two dimensions to determine strategies. In addition to those factors that constitute the two dimensions of the matrix the overall business strategy, the specific situation of the supply market, and capacity and intentions of individual suppliers was also incorporated. Thus the suppliers’ side is considered in the decision-making process for the purchasing portfolio analysis.

A conceptual model to outline the strategic directions, and responses for each category was presented by Gelderman and Van Weele (2003). This highlighted a dichotomy of strategies to i.) hold a position, and ii.) move to another position.

Consequently the purchasing portfolio is not managed as a fixed position; it is to be viewed as dynamic wherein regular reviews, reflection and revisions transpire. The conclusions of Gelderman and Van Weele (2003) determined that professional purchasers make clear distinctions between alternative strategies within each quadrant of the purchasing portfolio (Caniels and Gelderman, 2005). However, the conditions giving rise to determining the chosen purchasing strategy remained unresolved.

Therefore, drawing from the established knowledge covering strategic direction and positioning of portfolio products, it is proposed that certain conditions must exist to effect a change in the current portfolio product position. This study seeks to examine those conditions that may prompt holding or moving positions in a portfolio quadrant.

THE BUYER-SUPPLIER RELATIONSHIP

A short-term-orientated, adversarial buyer-supplier relationship focused on transaction cost economising inhibits development of supply management capabilities. It can create conditions of distrust and increase the need for parties to institute costly and complex governance mechanisms for curbing opportunistic behaviour (Carr and Pearson 1999; Chan et al. 2004; Paulraj et al. 2006). This ultimately dissipates potential cost benefits accruing. Chen et al. (2004) found that strategic purchasing contributes to effective supply management when it fosters a long-term strategic orientation between a firm and its suppliers. Furthermore, strategic purchasing and supply management capabilities can contribute to enhanced operational (customer responsiveness) and financial performance for the buying firm. In any event it is essential to commence any assessment of effective procurement and supply management from the “power perspective”, (Cox 2001, 4).

THE POWER PERSPECTIVE

Cox (2001) considered the power perspective in procurement and supply management the principal consideration by reason of three underlying issues;

i.) A need to re-assess growing consensus that historic focus on adversarial relationships be rejected in favour of long-term collaborative arrangements;

ii.) The commonsense deductive logic is that the best defence of a buyers position is the maintenance of highly competitive supply markets; and

iii.) If the common sense logic is valid the implication is that all buyer/supplier relationships must be inherently conflictual.

A choice between adversarialism and collaboration is simplistic, and presents a false dichotomy. Cox (2001, 5) considered the concept of appropriateness in relationship management. The appropriate relationship will vary due to time and circumstance. Only through understanding the resources that will augment or diminish the relative power of buyers and suppliers in a specific exchange relationship that practitioners can decide what the objective exchange circumstance should be. An indicative portfolio of relationship choices outlines the degree of collaboration relative to the degree of shared value.

This approach suggested that buyers or suppliers were free to adopt either symmetrical or asymmetric relationship management strategies in order to achieve their objectives, and reinforces the notion that no common best practice or generic approach exists in supply management. Generic strategies may be wholly unsuitable under particular circumstances. Cox and Ireland (2012) consider that for projects in environments where the demand profile is irregular and unique, as opposed to standardised, regular or episodic that alternative forms of exchange, where opportunism replaces collaboration as the more sensible approach, may be more desirable (pp 267).

POWER AND INTERDEPENDENCE

Building on the finding of Gelderman and Van Weele (2003) concerning the strategic directions within the Kraljic (1983) purchasing portfolio model, determination of the relative power position of the buyer and supplier was further assessed by Caniels and Gelderman (2005). This determination involved a comprehensive survey of Dutch purchasing professionals. Their contribution developed a power map to characterize the extent of the relative relationship dependence.
Expanding the strategic directions and recommendations presented by Gelderman and Van Weele (2003), the Caniels and Gelderman (2005) study interpreted and tested the fundamental assumptions (hypotheses) of portfolio models deduced from literature involving inter alia; the distinctions between purchasing portfolio movements and influence of the buyer/supplier relationships.

The hypotheses raised by Caniels and Gelderman (2005) regarding relative power and interdependence were confirmed with one exception, whereby results indicated that a strategic relationship is dominated by the supplier, indicative of greater buyer dependence. The original theoretical assumption maintained a power balance. This asymmetry is explained by reference to Cox et al. (2003), whereby a rebalance of power occurs post-contract as a buyer becomes locked-in.

A buyer will depend on his supplier to perform as conversely suppliers depend on the buying organization to perform. Accordingly the degree of dependence is considered a source of power. The relative power of an organization over another is a result of the net dependence of the one on the other (Caniels and Geldermen, 2007). Suggesting further studies of the buyer supplier relationship comprehensive insight requires a view broader than major/dominant suppliers or suppliers in general, given the existence of four observed relationship types.

In light of current awareness regarding the buyer/supplier relationships in a purchasing portfolio, this study will consider the buyer/supplier relationship for a specified purchasing portfolio item as classified in accordance with the Kraljic purchasing portfolio model. The objective is to empirically demonstrate perceived buyer/supplier relationships, assess the findings and relate the status to the conceptual frameworks. It is proposed to assess conditions creating asymmetry in a relationship, and consider whether symmetry can actively be achieved.

**REQUIREMENT FOR FURTHER RESEARCH**

This review has established the extant development of purchasing portfolio models. What has been demonstrated is that an array of models exists presenting a variety of situations based upon two-dimensional conceptual frameworks to multi-faceted empirically validated portfolio models. All provide methods for product classification in order to determine procurement strategy, a taxonomy or nomenclature for a portfolio of purchases classified by virtue of the product or the nature of the relationship.

The literature presented either in support or otherwise of the purchasing portfolio models and product classifications are all presented in specific environments, and note the validity relative to that environment. Most question the generalisability of their respective findings. This would suggest that applicability of purchasing portfolio models tend to be scenario specific. The implication is that only by testing the literature within a specific scenario can one determine the applicability of the current theory.

In any event it is considered that given levels of criticisms which sit alongside support for purchasing portfolio models as a solid basis for strategic planning the opportunity exists to test the model and its basic assumptions within a centralised purchasing unit operating in the Irish public sector. This study will seek to address the extent to which the prescriptive solutions and basic assumptions can operate in a complex environment.

**METHODOLOGY**

The basic assumptions derived from purchasing portfolio involve product positioning, buyer/supplier relationships and strategic direction for purchasing strategy. Based on those underlying principals it is intended to test the basic assumptions with reference to a specific product. Using natural gas as the product, purchased within a centralised public procurement authority, the questions this work will explore include;

1. How does the procurement of the supply of natural gas by a centralised public procurement authority conform to Kraljic’s (1983) purchasing product classification/matrix positioning?
2. What is the assumed buyer/supplier relationship for that product classification; and is it sustained in this circumstance?
3. What is the assumed strategic direction for this given product and is it viable in all circumstances?

The primary objective of the research is to understand the circumstances under which the basic assumptions for purchasing portfolio models and consequent strategy development may or may not be upheld. It is also intended to explore the concept of strategy development in the context of centralised procurement of natural gas for the public sector.

In gaining knowledge Alvesson (2011; 1656) suggested it is important to target the original framework to investigate and challenge the assumptions, rather than reproduce and reinforce established ones. Thus, the National Procurement Service (now the Office of Government Procurement) provides the functional live environment in which the writer can observe the dominant models and strategy frameworks and challenge the assumptions. This paper presents a case study incorporating a sub-unit of analyses in order that a more complex - or embedded - study is achieved to eliminate the generalities and mainstream harmonious views often inherent in institutional theory. In consideration of the research questions a multi-methods approach is adopted.

In the first stage of this study a questionnaire survey was applied to evaluate and measure perceived supply risk factors as understood by public sectors buyers, specifically in the context of the supply of natural gas. The purpose of this is to demonstrate the product supply positioning in a matrix. The basis for measurement and underlying questions for the survey were guided by supply risk criteria determined by the Supply Positioning and Risk
Evaluation Matrix (SUPREM). This SUPREM tool automatically generates product positioning charts and reports to support public procurement strategy planning in the Irish public sector. The tool, designed and developed by Queensland Purchasing, is available to public sector buyers under license and is based on the works of Peter Kraljic and others. The survey was disseminated to 409nr. public sector buyers.

Expert interviews were subsequently conducted to delve into a more qualitative examination of the preliminary findings from the questionnaire survey and to take the opportunity to explore purposeful discussion on data accumulated. Those whom graciously accepted to participate included the Head of Procurement for a large Local Authority, two Directors for the National Procurement Service, and a Partner / Head of the Construction and Procurement Group from one of Ireland leading law firms.

FINDINGS

The purpose of SUPREM is to demonstrate supply positioning as the core information integral to procurement planning, and to provide strategic direction to achieve value for money, procurement efficiency and corporate goals. A two dimensional graphical illustration of the supply positioning measures both relative expenditure and supply risk. Measurement of relative expenditure should be straight-forward. The value of expenditure on a given product is measured relative to the value of the basket of all other products and services, which form the portfolio of purchases. To inform this process relative expenditure was measured from data available from the 2009 Top 30 spend for public bodies.

Measurement of supply risk is product specific. SUPREM separates certain inherent risk criteria into three types; external factors, relationship factors and internal factors. The three risk factors are expanded into five interacting components. Assessment of these components, Nature of the Supply Market, Probability of Supply Failure, Complexity of the Supply Relationship, Strategic Importance to the Organisation and Impact of Supply Failure is necessary to rate the product in terms of the supply risk profile. These criteria and assessment factors outlined by SUPREM formed the basic rating questions of the questionnaire survey.

On this basis a profile for the natural gas product has been developed as outlined in Figure 2.

Figure 2 – Supply Risk Positioning Chart by SUPREM

The report generated by SUPREM classifies natural gas as a product with high relative expenditure and high difficulty in securing supply. This classification follows the assessment of the five risk factors based on the questionnaire survey results derived from 141 public sector buyers. According to SUPREM natural gas is a product categorised as a complex "bundle" or "package" of services critical to an organisations service delivery. Long-term relationships with suppliers would be common under these circumstances and consequently "effective contract management practices are essential for obtaining full value from the arrangement". The preliminary finding of the questionnaire survey, as measured by SUPREM has generated a result not originally anticipated. The results perceive the product supply demonstrates high levels of supply risk. The following findings were highlighted by SUPREM from the survey data;

- Nature of the Supply Market – Moderately favourable to the supplier
Probability of Supply Failure – Low
Complexity of Procurement Relationship – Slightly complex
Impact of Supply Failure – High

Strategic Importance to the Organisation – Important to very important

According to the survey data and resultant SUPREM supply positioning charts and report, the product is
deemed as complex with a procurement focus tending towards supply management, and is therefore likened to
"Strategic item" from the Kraljic matrix. The data analysis also highlighted additional factors that warranted further
review. This principally is based around the buyers' perception of the buyer/supplier relationship. It was indicated
that buyers detect low value as a customer, and believe that they maintain a weaker bargaining position with their
suppliers. Expert interview were conducted to delve into a more qualitative examination of the preliminary
findings.

**Purchasing Portfolio Positioning**

The current approach to the procurement of natural gas for the public sector is by means of centralised
aggregated contracts. The intention is to aggregate demand and leverage buying power. The rationale for this
approach to the procurement of natural gas by the NPS, was initially to aggregate demand not previously attempted
for this product. It also recognised the complexity of the market, whereby local individual public sector buyers or
non-experts may be de-barred from actively or successfully intervening in the market themselves. Mini-
competitions are run and contracts are awarded on a sector basis. The NPS sub-divide requirements into sectors
deemed necessary to deal with manageability or nature of the product. It also deals with regulatory fears or
potential for a large buying organisation to become a monopsony or potentially distort the market in some way.
However, the practitioners' view is that suggesting that this scenario presents a leverage situation is simplistic.

"If the understanding of "leverage" is that; should you go to the market en-masse you have got good buying
power, then the market will respond and respond kindly; is too simple a characterisation, especially in this
market. The suggestion that buying power gives you all the power in the market is also too simple. Power
lies in many places, and in this market the reality is that it exists on the supply side. Relative power exists
with suppliers in their knowledge and the inherent complexity of this market. This includes knowledge of
complex pricing structures, international markets and traded commodities, historic trends, the effect of
incidents on future trends, etc. The reality is that this needs to be looked at as two sides of a see-saw".

In any event, practitioners agree a product positioning for any purchase can never stand still. The ground is
constantly shifting under people. To address this situation requires awareness. Achieving this awareness involves
four courses of action. Firstly, realisation must be brought to bear that pure buying power does not mean absolute
power. Secondly, professional market knowledge needs to be acquired. Third, closer association with the industry
Regulator is essential to ensure greater articulation of industry developments and ensure clarity and transparency
for all market participants. Fourth, in cognisance of the fact that this market is still developing, responsibility for the
management of that development needs to be addressed to provide an appropriate and functional operating
environment. The combined effect of these four actions should neutralise what the supply market has, and tip the
see-saw in your favour, "creating an overnight success after ten years!"

**The Buyer/Supplier Relationship**

It has been established through the questionnaire survey that buyers consider their value as a customer very low
to moderate. This poor relationship between the public sector buyers and their natural gas suppliers was confirmed
through expert interview whereby the relationship was characterised as a "faceless rapport". It is felt that that this
occurrence is isolated to the supply of natural gas, as the procurement of electricity for example does not provide
similar experience. In probing the issue, the feeling was that there is limited market knowledge amongst the public
sector buyers, as they feel they have limited scope for alternatives, and there is little understanding of the product.

The finding that buyers perceived low value as a customer was not considered surprising by the procurists
units interviewees, taking account of how value is rated. If large buying power is perceived to mean high value as a
customer such a direct and simple correlation is crude and naive. However, there is the realisation amongst buyers
that a real vacuum exists in terms of understanding this product.

Another procurement expert suggested that there may be an issue here for framing and understanding the
suppliers' perspective. The procurement of this product is managed through a multi-supplier framework. It is
relatively straightforward to become a framework participant, winning contracts is much more difficult. This
arrangement does not provide any certainty to suppliers, and therefore framework participation loses its appeal. The
large volume is split, and regular competitions among seven framework participants on lowest price render the
supply contracts less economically attractive. Absent guarantees or long-term commercial commitment, suppliers
cannot present an opportunity to develop a constructive and meaningful buyer/supplier relationship. Adding value
as a buyer involves making the product more attractive to suppliers. It may be prudent to return the quantum or
provide greater volume guarantee to suppliers. Commercially this will generate more interest and the suggestion is
this is feasible through a single-supplier framework. Consequently, volumes are more defined, over a longer term.
Instead of offering a little mouse to the market, it becomes an elephant. This should generate enhanced interest and
create buy-in.

**Strategic Direction**
Experts concur that instinctively, the feeling is that “leverage” is not the natural fit for natural gas. The market, from both a practical and commercial perspective is geared towards longer-term arrangements. It would provide the opportunity for suppliers to acknowledge and commit to the business relationship; they would achieve greater certainty and could invest in enhancing the systems and relationships. The suggestion made by an interviewee is that the ground is constantly moving for this product, therefore the questions around whether to hold position or move toward another portfolio position are well-substantiated.

A strategy to develop a strategic partnership requires longer-term commitments. Potentially this could not develop until such time as the current power balance has been fully addressed and the procurement authority has a similar market knowledge and understanding as the suppliers. In this instance there is recognition in the value of allowing a situation to exist whereby the buyer and suppliers can invest in their larger energy requirements and associated infrastructure.

Issues regarding effects of either approach on market competition, or from the perspective of competition law were considered and not deemed relevant. Regardless, NPS competitions are open, transparent and nondiscriminatory toward all market suppliers. The guiding principles of EU public procurement Directives, non-discrimination, equal treatment, transparency, proportionality and mutual recognition prevail.

SUMMARY AND OBSERVATIONS
The extant literature extensively supports the appropriateness of purchasing portfolio models for supply management; albeit in application of distinctly differing dependant variables for measurement and classification. While Kraljic (1983) remains the most frequently cited informant for the purchasing portfolio approach to supply management, criticisms abound. Significantly, uncertainty clouds the appropriateness of the broad stroke purchasing portfolio approach given the complexity and fine distinction that exists in each circumstance in reality. It is against that backdrop this study sought to explore the basic purchasing portfolio assumptions. We have examined the applicability of the Kraljic (1983) purchasing portfolio model and how the associated assumptions translate into practice within the context of a centralised public procurement unit for the supply of natural gas.

PRODUCTION POSITIONING
Product classification is the elementary step in establishing purchasing portfolio positioning. 2 x 2 matrix positioning and product classification is determined by reference to two primary measurement variables. In the case of Kraljic, those measurement variables are relative expenditure (or profit impact) and supply risk. De facto measurement of relative expenditure appears straightforward. In actual fact this is problematic. For a centralised public procurement unit, the degree of uptake and participation in the framework contracts establishes this. Therefore the extent of participation and consequent level of demand aggregation directly affects, and creates difficulties for, measurement of relative expenditure in accordance with Kraljic (1983) in this context. Nonetheless, the primary focus of the critiques associated with purchasing portfolio models relates to the determination and measurement of supply risk factors.

The findings suggest that this product is perceived to present a high relative expenditure and high supply risk. This would be consistent with and lend support to the “Strategic Item” classification as framed by Kraljic (1983). However, in exploring the actual conditions and product supply management approach within the organisation, would suggest the product is managed as a “Leverage Item”. This is confirmed by reference to the multi-supplier framework approach, shorter contracted supply time horizons and focus on cost and price management. The difference in considered opinions regarding product classification relates to the extent of supply risk.

The conditions giving rise to the view that this product presents as a higher supply risk, in contrast to the low supply risk associated with leverage products, was captured in the survey data. Significant factors affecting the buyers observations included the nature of the supply market, deemed to moderately favour the supplier. Understanding and particularizing this insight highlights a low degree of perceived value as a customer, along with weaker perceived negotiation abilities. The theoretical assumptions underpinning these matters are discussed with respect to the second theme of this research, the buyer/supplier relationship.

Notwithstanding the research finding regarding the product classification, further research data from experienced practitioners has outlined that simplistic nomenclature associated with Kraljic is uncharacteristic and can confound deep understanding of multifaceted procurement processes in complex markets. Insofar as it is broadly promulgated that “leverage” means strong buying power, the research unquestionably determines that this is not the case, regardless the level of demand aggregation. This seems to be consistent with the views expressed by Terpend et al. (2011; 85) whereby the dichotomy between product and market dimensions in portfolio models is too simplistic to capture the nuances of highly complex procurement processes.

THE BUYER/SUPPLIER RELATIONSHIP
Determination of the relative power position of the buyer and supplier, as assessed by Caniëls and Gelderman (2005), hypothesised that certain conditions underpin the buyer supplier relationship for each of the four Kraljic product classifications. For “Strategic Items” three product management strategies prevail, which are based upon two observed buyer/supplier observed relationships types, balanced buyer/supplier dominance or supplier dominance. In the case of “Leverage items” the literature hypothesises that either the buyer dominates the
buyer/supplier relationship or equal and balanced status exists. Consequently, two options exist for determining strategy, exploit buying power or develop a strategic partnership.

However, this research finds that for this product, an asymmetry exists in the buyer/supplier relationship in the natural gas market, in favour of the supplier. The theoretical assumptions presented by Caniels and Geldermans (2005) are not supported. Buyers have revealed evidence of a “faceless rapport” with suppliers, perceive low value as a customer, and the weaker negotiation position. In consideration of these findings, Cox (2001; 5) states that there is no “best practice” approach to buyer/supplier relationships and pointed to the objective circumstances of the engagement to determine an “appropriate relationship” with suppliers. This appears to present a pertinent explanation in the prevailing situation.

The research has outlined that a number of avenues exist to manage the power balance in the natural gas market. The route to rebalancing the power position in favour of the buyer is achievable through a number of methods. Pivotal issues revealed in the research include increasing the market knowledge and providing a more attractive offering to suppliers. In this case study analysis the NPS redresses this perceived imbalance by employing resources to increase that market knowledge, and present alternative market offerings to increase attractiveness to suppliers.

**STRATEGIC DIRECTION**

Developing supply strategies was fundamental to the Kraljic (1983) purchasing portfolio approach. While Kraljic developed strategies for “Strategic Items”, Gelderman and Van Weele (2003;215) complemented this approach by developing strategies for all four product classifications. The basic thrust of the literature involves one of two tactics for effective supply management; a strategy to move product position or a strategy to hold the current position. A rudimentary “do nothing”, or “do something” scenario.

The theoretical assumptions underlying a decision concerning strategic direction were suggested by Caniels and Gelderman (2005;149), and relates to the balance of power in the buyer/supplier relationship. Their study contends that for leverage products the exploit power or “hold” position strategy suggests buyer dominance in the prevailing buyer/supplier relationship, and balanced buyer/supplier power in the “move”, or develop a strategic partnership situation.

This research has highlighted issues regarding the actual buyer/supplier power positions for a leverage product, which does not conform to the assumed theoretical situation. This presents difficulties for directly applying the intended strategies as presented by Caniels and Gelderman (2005). That considered, the finding of this study indicate that both options remain viable, and the “hold” position is being maintained. The conditions that give rise to this development appear to have been created by the supply market and external environmental circumstances and consequently involve the NPS actively re-establishing the power balance to the buyers favour.

Within the NPS both options are constantly under review, and always considered. Furthermore, decisions regarding strategy are frequently revisited. The writer has found that options regarding strategy development are actively monitored in the present with a view to the future. Indeed, and in support of Gelderman and Van Weele (2003;215) the NPS has provided evidence of reliance on overall business strategy, the specific situation of supply markets, and capacities and intentions of individual suppliers to deduct strategies for individual portfolio products.

It is suggested that third scenario has been observed for leverage products in the NPS. This bears closer resemblance to the strategies presented by Gelderman and Van Weele (2003;212) for managing bottleneck products. For bottleneck items the observations were of supplier dominance, and the strategies involved reducing dependence and risk to find alternative solutions (move) or accepting the dependence and reducing the negative consequences (hold). The observation within the NPS is that a “hold” strategy is retained for a leverage product, while actively reducing dependence and risk.

**CONCLUSION**

This study sought to establish whether purchasing portfolios models and the associated theoretical underpinnings present an appropriate and pertinent approach to purchasing or supply management, or are they merely founded on institutionalised rhetoric and myth. Natural gas is a complex product, as discovered in value chain analysis, and procurement operates in a market likened to the collapse of the former Soviet Union by an experienced practitioner. The procurement of natural gas by the NPS conforms largely to the criteria contained in Kraljic’s (1983) purchasing product classification/matrix positioning for a leverage product, however, the predicted buyer/supplier relationship for that product classification is not sustained in this instance. Consequently, a blended strategy similar to the assumed strategic direction for bottleneck products has been observed.

Conclusively, replication of archetypal strategies and their theoretical assumptions without sufficient understanding of environmental circumstances surrounding successful implementation can engender cultural imprudence. It can only be through understanding the fundamental grounds for success or otherwise, that progressive and effective strategies can be accomplished. Purchasing strategies will always be contextually and relationally dependent. This research has revealed that institutionalised myths can present false perceptions. Leverage does not imply bargaining power. Such a fundamentally flawed pre-conception has the capacity to damage the buyer/supplier relationship and consequent approach to the market. Furthermore, procurement professionals are aware that fervent supplier interest is not always evident, and anecdotal even large multinational organisations can find that size can work against them.
Just as strategy involves understanding the larger system you’re in, procurement strategy formulations are modelled on prevailing circumstances with due regard to environmental and contextual circumstance - a pattern emerges in a stream of decisions. Purchasing portfolio models are useful tools for guidance, but require approach in full knowledge of all the circumstances and assumptions. Effective supply management and strategic procurement is fundamentally a dynamic process, taking place in an environment where the ground is constantly shifting.
ABSTRACT

In June 2013 the Court of Justice of the European Union (CJEU) gave a ruling in a dispute between a supplier and a Union of Municipalities in Germany, the Pie enbroc case [1]. The background to the main proceedings was a contract between the Union and one of its members (the city of Düren), under which the city would perform cleaning services in the Union’s premises located in the city. A vendor protested against the contract and argued that the contract fell under Directive 2004/18 and should have been procured.

The CJEU stated that the contract in question was to be considered as a public contract which would normally fall under the EU procurement rules. The Court then examined whether the two exceptional situations that it developed in the case ec al [2] and in the case amburg Chamber [3] were applicable. The so-called Teckal-exception (also called the In-house exception) allows a contracting authority to award a contract without tendering to a supplier that the authority controls (typically a municipal subsidiary), if the supplier’s main activity is to serve the contracting authority. This exception was however not applicable because the Union of Municipalities did not control the city.

Further, the CJEU examined whether the exception for public-public cooperation was relevant (the Hamburg Chamber case). Under this exception contracts between public agencies do not need to be procured if the agreements are solely between public units, without the involvement of any private party, no private provider is given any advantage over its competitors and the cooperation solely is governed by considerations and requirements that are designed to achieve objectives in the general interest. The CJEU found that neither of these exceptions was applicable, why the contract should have been awarded under the EU procurement rules.

The presentation will examine under which circumstances it is possible for contracting authorities to cooperate without prior procurement, considering the latest jurisprudence of the CJEU.

INTRODUCTION

There are no provisions regarding cooperation regarding purchases between contracting authorities in the EU Directives adopted in May 2004 [4]. Since there are no explicit exceptions, the general rules is that such procurement must follow the provisions of the Directives. The interesting question to be examined in this paper is when it is possible for contracting authorities to purchase goods, services and works from each other without putting the purchase out for competition according the to the EU Procurement Directives.

The only guidance today on the possibility for contracting authorities to cooperate when fulfilling needs in the general interest is therefore the jurisprudence of the CJEU. On the question of public cooperation, the CJEU has delivered three important cases, the above mentioned ec al case, the amburger Chamber case and the Pie enbroc case, which will be examined in the next paragraphs.
THE TECKAL CASE

The general rule of the awards of contracts of goods, services and works above the thresholds of the provisions of the Public Procurement Directives is that they have to be put out to competition [5]. The CJEU however upheld in the case *ec al* that the award of contracts between legally separate persons can take place without competition, provided that two criteria, the so-called *ec al criteria* are met [6]. The first criterion is the so-called control criterion, according to which a contracting authority exercise control over another legally distinct person similar to that it exercise over its own departments. The second criterion is the so-called activity criterion, according to which the legally distinct person, from which the purchase is made, must carry out the essential part of its activities with or on behalf of the authority or authorities that holds it. Assuming that the two mentioned criteria are met, the contract is deemed not to comply with the public procurement definition of contracts, and the award is considered instead to be an agreement in-house that are not covered by the Directives. It is also possible for several contracting authorities to jointly own and control a legally distinct person. In these cases, the cooperation carried out in the legally distinct person is called institutionalized cooperation.

In later decisions, the CJEU has developed the control and operational criteria. It has a developed a number of objectives, such as in the case *ehil inen and er eystalo ealthcare* [7], where it was establish that when there are private shareholders in the legally distinct person, the control criterion could not be fulfilled. The contract should in such cases be awarded in accordance with the Directives. In the case *ragsa* [8] the CJEU found that both criteria were met, because the legally distinct person was a dependent company that could not refuse to deliver to the owner, it was not free to determine its prices to the public and it performed the bulk of its activities to the contracting authority. In November 2012, the CJEU the CJEU found in the case *conord* [9] that that is was not enough for a contracting authority to only own shares in shareholders company to be considered to have a control over the company. It is also required that all contracting authorities participate in the company's governing bodies.

An interesting question is whether Teckal criteria are applicable to the award of contracts in the Primary Law of the EU. The question arose in the case *Par ing ri en* [10]. The CJEU referred to its previous practice regarding the Teckal criteria, and found that this only related to whether the contracts would have been covered by the Procurement Directives. For the Procurement Directives to be applicable, it is *inter alia* a condition that a written contract has been concluded. The CJEU stated, however, that there was no requirement for writing in the primary law provisions for those to apply. CJEU stated that the considerations relating to the Teckal criteria despite it being only case law referring to contracts covered by the Directives, also could be transferred to the award of service concessions. The general principles of equality and non-discrimination on grounds of nationality in Article 18 in the Treaty on the Functioning of the European Union (TFEU), Article 49 TFEU and Article 56 TFEU are equally applicable to grants of a contract in which a public authority entrusts the supply of economic activities to a third party, whether in the public procurement directives or as award of a service concession. The Court concluded that:

> European Union legislation in the field of public procurement or service concession will not apply when a public authority with its own resources - administrative, technical and others - performs public interest tasks assigned to them, without turning to external devices.

The provisions of Primary Law are therefore not applicable when a contracting authority exercises control over a legally distinct person, which is equivalent to that exercised over its own departments, if the legally distinct person carries out the essential part of its activities for or together with the contracting authority or authorities holding it. The award of contracts below the EU thresholds and of B-services falls under the same rules and principles in Primary Law as service concessions, if they are of a specific cross-border interest. It is therefore a likely conclusion that the reasoning of the CJEU in relation to Primary Law also includes awards of these types of contracts.

Here may also be mentioned the case *Commission S ain* [11]. The CJEU held that a provision of the Spanish law that exempted all awards of public contracts between authorities and publicly controlled bodies from the Spanish procurement regulations were unlawful. It is therefore not possible to make any general exemption from the regulatory framework for public procurement. Instead, an *in casu* assessment must be made, in which the jurisprudence of the CJEU must be considered.
THE HAMBURGER CHAMBER CASE

It is possible for contracting authorities to jointly perform tasks assigned to them, without the Procurement Directives being applicable even when cooperation takes place in unregulated forms. In the case of the Chamber of Commerce, four contracting authorities had concluded an agreement directly with the City of Hamburg for the disposal of waste in a new incinerator [12]. The agreement committed the company Hamburg Stadtwerke to provide a capacity of 120,000 tonnes per year for the incineration of waste in the plant. The contracting authorities undertook to pay an annual fee, which was partially fixed, partially due to the amount of waste delivered. The question was whether the cooperation was covered by the German public procurement regulations. The CJEU began by emphasizing that EU law does not require contracting authorities to use any particular legal form in order to jointly ensure that a public service task is performed. Next, the Court held:

It must be observed, though, first, that Community law does not require public authorities to use any particular legal form in order to carry out jointly their public service tasks. Secondly, such cooperation between public authorities does not undermine the principal objective of the Community rules on public procurement, that is, the free movement of services and the opening-up of undistorted competition in all the Member States, where implementation of that cooperation is governed solely by considerations and requirements relating to the pursuit of objectives in the public interest and the principle of equal treatment of the persons concerned, referred to in Directive 92/50, is respected, so that no private undertaking is placed in a position of advantage vis-à-vis competitors...

For a formless cooperation between contracting authorities to be excluded from the scope of EU law, it is required that it is done without the participation of private capital, that the agreement is a true partnership that aims to jointly conduct a public task and that the cooperation solely is governed by considerations of general interest. If the conditions in the case of the Chamber of Commerce are met, such cooperation between contracting authorities do not affect the main objective of the Community rules on public procurement, i.e. the free movement of services etc. and the undistorted competition in all Member States. The ruling is however not entirely clear and has given rise to some discussion in the legal literature.

Steinicke notes p.a. that the CJEU mainly focused on two aspects in the Chamber of Commerce case; it involves the utilization of a public interest and the process takes place without the involvement of private participants [13]. Regarding the issue of public interest, he notes however, that the Court does not clarify what is covered by a general interest. He therefore argues that the question marks regarding contracting authorities opportunities to collaborate formless persists even after this ruling.

THE PIEPENBROCK CASE

In the case of Piepenbrock, the company Piepenbrock had performed property cleaning for an association of municipalities called Kreis Düren [14]. The association included the City of Düren. Under the law on municipal collaboration in North Rhine-Westphalia region it was possible for local authorities and local authority associations to agree for one of them to take over tasks from the other party, a so called delegation agreement, or for one of the parties to undertake to perform such tasks for the other parties. Appropriate compensation for such agreements was to be prescribed in the agreements.

Kreis Düren drew up a draft agreement with the City of Düren, according to which Kreis Düren would transfer responsibility for the cleaning of their office government and school facilities in the region to the City of Düren for compensation. The City of Düren was to be solely responsible for compliance in regards to Kreis Düren's obligations relating to the cleaning of their buildings in the region. Kreis Düren reserved the right to verify that the task was performed correctly and could unilaterally terminate the agreement if the City of Düren did not fulfil the contract obligations. The City of Düren had the right to hire a third party for the actual execution of the contract and the contract period was initially set to two years.

The company Piepenbrock appealed, claiming that Kreis Düren was prohibited from entering into the relevant contract without tendering. The basis of the claim was that the cleaning service was a service that was requested on the market and could also be provided by private providers. There was no question of a kind of in-house contract, for which exemption from the procurement rules were applicable, since Kreis Düren had no control over the City of Düren. The national court held that there were a number of ambiguities regarding how the contract would be assessed and requested a preliminary ruling from the CJEU.

Initially, the CJEU noted that Article 1.2 of Directive 2004/18 includes all written contracts for pecuniary interest concluded in writing between a contracting authority and an economic operator, whether the latter also is a
contracting authority, not primarily engaged in business for profit, is organized as a business or not permanently present in the market. Further, the CJEU found that the activities covered by the agreement constituted services in the Directive 2004/18, and that the contract had been concluded for pecuniary interest since compensation was paid under the agreement. In summary, the Court found that the agreement in principle constituted a public contract.

Further, the CJEU considered whether there were grounds for finding that the agreement was exempt from the obligation to use the procurement regulation. The Court noted that the criteria as set in the *ec al* doctrine were not met. This was because the control criterion was not met, but also because the City of Düren did not perform the major part of activities for Kreis Düren. Further, the Court found that there was no question of excluding the contract from the procurement regulations due to collaboration between public entities, as established in the case *amburg Chambler*. It was clear from the national court's reference that the agreement did not appear to be designed to establish cooperation between the both contracting authorities for the purpose of fulfilling a common public service mission. Moreover, the City of Düren could rely on a third party to complete the assignment, whereby a specific supplier could benefit from the agreement compared to other companies operating in the same market. The CJEU therefore held that an agreement such as the current was a public service contract within the meaning of Article 1.2 of Directive 2004/18.

CONCLUSIONS

This paper has examined the three leading cases in the area of public procurement regarding various forms of collaboration between contracting authorities. So what is the conclusion, when can contracting authorities collaborate without having to put the collaboration out for competition?

In the jurisprudence after the *ec al* case is has established that contracting authorities can collaborate by creating joint companies. The condition is that they have a control over the independent company equal to that they have over their own departments, and that the separate entity's operations is mainly carried out for or in conjunction with the contracting authorities. It is also a condition that no private companies are involved in the cooperation.

In the *amburg Chambler* case it was established that contracting authorities can cooperate in an association of municipalities and make joint procurements, in which one of the parties will be doing the procurement and charge the others for the actual cost of procuring the contract. The prerequisite for this collaboration is that the contracting authorities through the cooperation perform some type of public service, which is covered by their mission to accomplish.

However, it is not possible for one contracting authority to acquire the services of another, without other cooperation than that one contracting authority pays and the other delivers. In the decisions in the *Pie enbroc* case, the CJEU states that an agreement in which a contracting authority provides another contracting authority with the task to perform services for a contribution, while it reserves the right to verify that the task is performed correctly and the performing authority may use a third party, is a public service contract. The CJEU thereby confirms its previous jurisprudence, in that none of the circumstances identified in the *ec al* case or in the *amburg Chambler* case existed. The Court has thus, instead of creating a new exemption from the Procurement Directive, clarified that the legal position is still the same and that there are only a limited number of exceptions to the procurement requirement for the award of public contracts.

The two relevant criteria for not considering the contract in the *Pie enbroc* case to be excluded from public procurement, is that it could be established that there was a of provision of services for which compensation was paid, and the City of Düren had the opportunity to hire a third party to perform the services. This enabled a supplier in the relevant market being awarded a contract for the performance of cleaning for a contracting authority's behalf, without having been subject to previous competition. If the Court had held that the contract in question was not acting as a public contract in meaning of the Directive, the practical effect had been that contracting authorities had been able to circumvent the procurement regulations. They had been able to establish agreements among themselves in which one of them later takes over the other authority's obligations with the right to engage a third party for the performance of a specific contract. This later authority had then been entitled to contact a private supplier and let it perform the services in question without ever putting the contract out for competition.
REFERENCES


[7] Case 215/09, Mehiläinen och Terveystalo Healthcare. See also Case 26/03, Stadt Halle och RPL Lochau, Case 573/07, Sea and Case 196/08, Acoset.

[8] Case 295/05, Tragsa.


[12] Case 480/06, Hamburg Chamber.


Strategies in Public Procurement: Is there a deficit?

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Introduction

Public procurement is facing the dilemma of competing priorities and goals such as cost efficiency, legal conformity as well as the advancement of environmental protection and the promotion of innovation. Politically dominated public procurement strategies focus on these targets increasingly but in most cases an alignment with a business strategy is missing, at least in terms of a business administrational understanding. According to this, the paper analyzes the status quo of public procurement strategies using a systematic literature review. By means of an analytical framework for public procurement the investigation is based on a selection of ten management journals from 2002 to 2012. Only a small number of papers are found that fit to our subject; most of them are classified as normative and political driven, with less elements of a strategy for public procurement. Further, the idea of a strategy process combining normative targets with detailed procurement and awarding activities has almost been neglected so far. Additionally, the paper draws an agenda for further research needs in the field of public procurement in order to align political and functional strategic levels. We conclude with recommendations for public procurement managers in terms of closing strategic gaps of public procurement.

Goal congruence in public procurement: Towards the need of a procurement strategy in the public sector


Just like a mirror image to the restart of the strategic discussion in the field of industrial procurement, public procurement is recently confronted with strategic goals and the dilemma of competing targets. The discourse comprises the sense and transferability of main targets which at least partially compete with each other. Such goals are for example the cost efficiency, the legal conformity with procurement law and the support of superordinate priorities such as the advancement of women in business, the promotion of regional companies or SMEs in general and the protection of the environment. The latter can be understood as strategic (and politically set) goals of public procurement (Schapper et al., 2006). Figure 1 illustrates the necessity of integrating different target dimensions of public procurement into a system of objectives. Procurement is classified as public in the case that the contractor is a public entity fulfilling public tasks and thus bounded to procurement law (functional understanding of the status of a contractor). Consequently, not only public authorities are categorized as public contractors, but also private Ltd.s owned by the state.

Foremost, the strategic relevance of public procurement is mirrored in high procurement volumes of the public sector. The contracting volume for goods and services of European member states amounts 16.3% of the GDP on average and 21.5% on top (EU, 2007). In total, public entities in Europe spend about 1,550 billion Euros, excluding process costs for the fulfilment of public tenders. In Germany for instance process costs for public procurement are estimated to equal 19 billion Euros per year (Kröber et al., 2008). Furthermore, efficiency and effectiveness of public procurement are frequently criticized (Bundesrechnungshof, 2012) indicating a promising potential for savings. Because of the high public procurement volumes an increase in efficiency of only 0.5% would release billions of Euros which are urgently needed for the realization of the above mentioned political goals.
Recent discussions in public procurement practice concentrate on the way of realizing strategic (political) goals through public procurement.

![Figure 1: Target dimensions of public procurement](image)

This is not easy, as public procurement officials must deal with a broad range of issues. They have been walking on a tight rope in (Thai, 2010):
- Balancing the dynamic tension between (a) competing socioeconomic objectives, and (b) national economic interests and global competition as required by regional and international trade agreements;
- Satisfying the requirements of fairness, equity and transparency;
- Maintaining an overarching focus on maximizing competition; and
- Utilizing new technology to enhance procurement efficiency, including e-procurement and advanced technologies.

Erridge and Mcllroy (2002) identified three sets of sometimes conflicting goals against which public procurement policy may be analyzed: regulatory (i.e. compliance with the European Union Public Procurement Directives), commercial (i.e. use of market mechanisms to achieve reduced cost and increased quality) and socio-economic (i.e. use of public procurement to support wider government policy, including employment, social exclusion, protection of minorities, economic development and environmental policy).

Erridge (2005) first assessed the UK public procurement policy against these regulatory, commercial and socio-economic goals, proposing an analytical framework for evaluating the delivery of public procurement policies; he also concluded that, although the achievement of regulatory and commercial goals and values remains important, opportunities to deliver wider socio-economic policies through public procurement should be pursued more extensively.

According to this, the EU gives several recommendations such as the “EU 2020 Strategy”. A further EU proposal for reform comprises five modernization areas combined with twenty detailed suggestions for improvement. Several advices mention public procurement as instrument for the achievement of political goals. This argument follows the idea of a procurement conception with corresponding objectives, strategies and instruments which in turn are hierarchical organized, but also interrelated to each other (Becker, 2009). Consequently, procurement strategies represent the framework for action for goal achievement and the coordinated use of operational procurement instruments.

As a result, the EU proposal for reform focuses on procurement strategy content (EU, 2014); procurement strategy process actually appears to be neglected. Further, only a weak alignment of the political-normative level demanding political goals with the management of public procurement and contracting authorities respectively becomes evident. Keeping this initial suspicion in mind, the paper uses a systematic literature review in order to identify the status quo of public procurement strategies. Finally, we seek to disclose strategy dimensions and strategy gaps in public procurement to derive recommendations for future research activities.
Method and analytical framework for the analysis of public procurement strategies

The systematic content analysis of the identified papers is based on the integrative approach of Hart (1992), as well as Essig and Wagner (2003) in terms of procurement strategy. According to this, exogenous factors of the environment or the market (procurement environment) are differentiated from endogenous strategy dimensions within the public sector. In this regard, the make-or-buy decision and the contracting authorities respectively represent the main interface to the supply markets (Weiss, 1993). Based on the assumption of a procurement conception public procurement strategies are routines for action for the realization of superordinate (political) goals. For this reason, the underpinning approach of the systematic content analysis considers interfaces to the political level and to other functional strategies (HR, Innovation etc.). Moreover, structural requirements in terms of the organization of the purchasing department (supply chain design-strategy) or the purchasing category level and the contract awarding respectively are essential dimensions of a public procurement strategy reflected in the present approach. In addition, strategy process represents the counterpart of strategy content (Miller, 1989; Ketchen et al., 1996) aligning and coordinating all available strategy dimensions (Essig & Wagner, 2003). Figure 2 illustrates the analytical framework of the systematic literature review; the included numbers for the strategy dimensions refer to the following tabulation.

![Analytical framework for the literature review.](image)

In terms of content, we elect to define topics that are part of the Public Procurement domain and to select journals accordingly. Looking at the theoretical multi-level framework which has been designed for this work, it is possible to appreciate the variety of topics that are part of the Public Procurement strategy scope. Furthermore, it is also possible to obtain an idea of a hierarchical classification of different topics, which can be related to three specific dimensions: “strategy”, “procurement” and “public sector”. The different and combined search strings used for the identification of relevant papers, were: “strategy”, “strategies”, “strategic” for the first dimension; “purchasing”, “procurement”, “sourcing”, “acquisition”, “contracting”, “materials management”, “supply”, “supply chain” for the second dimension; and “public”, “administration”, “defence”, “federal”, “governmental”, “government”, “municipality”, “state”, “regional”, “city”, “cities” for the third search dimension. Predominantly, the search strings for journals in the field of public administration concentrated on the dimensions “strategy” and “procurement”. The proceeding of the literature review is based on Levy and Ellis (2006) in combination with Denyer and Tranfield (2011).

As a result of this effort, we are able to choose among two sets of journals: we investigate papers from scientific journals in the field of public administration and new public management; additionally, selected scientific journals in the field of industrial management with a focus on PSM (purchasing and supply management) are also part of the analysis.

In terms of impact on the scientific community, we select journals with a Source Normalized Impact per Paper (SNIP) above the mean of the SCOPUS database (Moed, 2010). SNIP is defined as the ratio of the journal’s citation count per paper and the citation potential in its subject field. It aims to allow a direct comparison of sources in
Different subject fields. Citation potential is shown to vary not only between journal subject categories – groupings of journals sharing a research field – or disciplines (e.g., journals in mathematics, engineering and social sciences tend to have lower values than titles in life sciences) but also between journals within the same subject category. As a matter of fact, the SNIP, in comparison with other indicators such as the SCImago Journals Rank (SJR), corrects for such differences.

According to this, ten selected journals are systematically investigated for papers subject to public procurement strategies; five from the field of industrial PSM and five seven from the field of public administration. The selected industrial PSM journals are International Journal of Integrated Supply Management, Journal of Business Logistics, Journal of Purchasing and Supply Management, Journal of Supply Chain Management, Supply Chain Management: An International Journal. The selected journals in the field of public administration / new public management are Public Policy and Administration, Public Administration Review, Public Management Review, Public Administration: Research and Theory, Journal of Public Procurement, International Journal of Public Sector Management, and Public Administration: An International Quarterly. The literature review concentrates on publications in the time frame from 2002 to 2012; selected papers published before 2002 are also included in the case that public procurement strategies are the main topic (Erridge & Murray, 1998; Cope, 1995).

The result of the literature search based on the different search strings are 150 papers in total; after a careful investigation of the individual abstracts of the papers only 30 relevant contributions for the systematic review are identified. Even if the number of paper appears to be relatively low, the review includes a few basic contributions on public procurement strategy (Erridge & McIlroy, 2002; Matthews, 2005) and papers that discuss individual elements of a procurement strategy for the public sector (Fearne & Martinez, 2012; Wagner et al. 2003).

**Results**

**Essential findings regarding the content**

The findings of the literature review are based on a total of 30 papers showing that only a low number of contributions relates to procurement strategies but with a strong focus on strategy content. Topics such as procurement law or macroeconomic strategy dimensions are focal points, while other information remains largely untouched, such as e.g. purchasing categories. An example of a macro-economic analysis is the contribution of Handfield (2004) who examines the impact of a statutory deregulation of the energy market on procurement strategies.

A need of explanatory research becomes evident concerning the problem of strategy development, in particular the coordination of political and functional strategy levels. According to this, the contribution of Khalfan et al. (2007) recommends an “alignment of a coordinated communication” between all stakeholders on the objectives, results and activities of the contract awarding in terms of big (public) construction projects. Breul (2010) discusses the manner in which such coordination should take place. He selectively focuses on individual elements of the procurement strategy such as sourcing policy, competitive sourcing or crowd sourcing from a public procurement perspective. A further topic of the investigated papers is the influence of political action on public procurement. Murray (2007) analyzes the “role of local politicians” in the strategic sourcing process using the example of the UK. He defined the concept of strategic public procurement and derives stages and tasks of a strategic public procurement process. The same author (2009) highlights how central governments try to “push” (directly and indirectly) local authorities to rationalize their procurement practices, in order to support economic recovery during recession period. Finally, Matthews (2005) describes existing limitations and barriers to public procurement in order to develop a strategic discipline.

A number of authors analyze the awarding of contracts through public authorities with regard to the implementation of policy objectives into contracting agreements. Preuss (2009) examines the realization of environmental, social and economic objectives by local procurement agencies. Similar topics are discussed by Nijaki and Worrel (2011) and Wang and Li (2013), with a particular focus on green public procurement. Fearne and Martinez (2012) discuss the design of sustainability strategies in supply chains in general, while Romzek and Johnston (2005) only investigate social aspects. In this regard, service contracts of public authorities with private providers are evaluated in terms of the inclusion of social performance standards. Thus, social standards have been sufficiently reflected in supplier contracts, but an implementation of adequate measures for assessing social standards is still missing. Cope (1995) examines the impact of a “politically intended” outsourcing decision on employees. A business case of cleaning services is able to clarify that, although from the client perspective, a cost reduction could be achieved, but this was at the expense of socially responsible public procurement representing a strategic goal. Cleaning services are mainly characterized by the cost of manpower. The supplier could only realize an optimization by employing service staff at significantly worse conditions. Further, Gonzalez et al. (2013) investigate the situation of service outsourcing in the largest Spanish town halls. They identify cleaning, parks and rubbish collection services as being the most often outsourced and public safety the one in which the participation of external firms is least sought. Malatesta and Smith (2001) analyze public contracts and their design using insights of the resource dependency perspective. According to this, mutual dependencies between customer and supplier require contracts with more flexibility (cost-plus). Very similar is Watts’ (2005) approach of “Strategic Service Delivery Partner-ships”
considerations may be provided by Lian and Laing (2004), who consider the purchasing of health services as a unit still needs to align the procurement strategy with other functional strategies (Venkatraman, 1989). Some general implications of this research are that public procurement strategy is in place, and this can happen only when purchasing repositioning programs are implemented. In the case of the workplace of the public sector, this strategy is an effective lever for the realization of strategic (political) goals (Kahlenborn et al., 2011). Academics started to perceive this procurement role first in 2000, when Murray tried to demonstrate that purchasing can contribute to the political objectives of (local) government only when a strategic alignment between central, local and procurement strategies and, astonishingly, the awarding strategy has been neglected within public procurement so far. Further, the structured content analysis illustrates that an inclusion of other functional strategies, purchasing category strategies and, astonishingly, the awarding strategy has been neglected within public procurement so far. The concept of an outsourcing decision for police force services. In addition, politics identified public procurement as an effective lever for the realization of strategic (political) goals (Kahlenborn et al., 2011). Academics started to perceive this procurement role first in 2000, when Murray tried to demonstrate that purchasing can contribute to the political objectives of (local) government only when a strategic alignment between central, local and procurement strategy is in place, and this can happen only when purchasing repositioning programs are implemented. Additionally, the structured content analysis illustrates that an inclusion of other functional strategies, purchasing category strategies and, astonishingly, the awarding strategy has been neglected within public procurement so far. None of the investigated papers investigates these dimensions as a main topic. Consequently, public procurement still needs to align the procurement strategy with other functional strategies (Venkatraman, 1989). Some general considerations may be provided by Lian and Laing (2004), who consider the purchasing of health services as a unit and procurement strategies are in a mutual relation. The paper of Suarez (2010) is special since it refers to the group of “non-profit organization” as some kind of extraordinary public contractor. Non-profit organizations only possess the status of a public authority if their organization receives public funding. Further, the paper refers to “procurement” as to the acquisition of public funding. He concludes that a high degree of professionalism results in a higher chance of success. Almost similar to Suarez’s paper is the contribution of Wild and Zhou (2011); they concentrate on procurement strategies for specific organization forms for humanitarian enterprises shaping a framework for “ethical sourcing”. The contribution of Wagner et al. (2003) is highly focused addressing public authorities in the context of “local councils”. According to this, local councils intend to support the implementation of an electronic procurement strategy in SMEs. Also Murray (2009) and Nijaki and Worrel (2012) explore the role of public authorities, respectively in supporting the development of national economy or the implementation of sustainable principles. Even Stanton and Burkink (2008) look at individual aspects of public procurement strategy, here for small and medium-sized farms in the U.S. The derivation of recommendations for the procurement practices also represents a thematic focus of some of the considered publications. Globerman and Vining (1996) develop a valuation approach for outsourcing decisions in the public sector. Herein, transaction costs are determined investigating specificity, complexity of tasks and vulnerability in terms of competitive intensity. The approach of Girth et al. (2012) demonstrates an empirical analysis of management options in “extensive competitive service markets” from the perspective of the public sector. They conclude that different competitive conditions in the procurement market require an individual management by public purchasers. Finally, Yeow and Noble (2012) classify the sourcing of innovation as an “highly complex management task” and demand the use of project management techniques with reference to a case study in the healthcare sector in the UK.

Only the contributions of Erridge and McIlroy (2002), Erridge and Murray (1998) and Kamann (2007) have a business administrational understanding of strategic procurement management. This is especially true for the Erridge and Murray (1998), who try to transfer the approach of “lean supply management” to the public sector. The core of their approach is to achieve the so-called “best value” for citizens as end-customers of public services and therefore public procurement. Politicians carry the interests of citizens; this understanding requires the consideration of political goals (so-called “socio-economic goals”, Erridge & McIlroy, 2002). Kamann (2007) attempted to solve the problem of the exchange relationship between citizens and the state using the stakeholder approach, which defines various interest groups for the management of public procurement.

Matching the results with the analytical framework
Matching the findings with the eight framework dimensions enables an aggregation of the individual observations in order to derive recommendations for action. Table 1 provides an overview of this classification supporting three key statements. First, strategic priorities of public procurement focusing on make-or-buy decisions and the implementation of political goals become evident. This finding also mirrors the pressure politics is actually facing. Due to existing financial constraints, an increase in outsourcing of public tasks and ultimately rendered by private enterprises is still taking place (Reichard, 2004). Barnes and Anastasiadis (2003) were probably one of the first authors highlighting the need of a make-or-buy strategy and evaluation also for public bodies, supporting their evidence with an example of an outsourcing decision for police force services. In addition, politics identified public procurement as an effective lever for the realization of strategic (political) goals (Kahlenborn et al., 2011). Academics started to perceive this procurement role first in 2000, when Murray tried to demonstrate that purchasing can contribute to the political objectives of (local) government only when a strategic alignment between central, local and procurement strategy is in place, and this can happen only when purchasing repositioning programs are implemented. Further, the structured content analysis illustrates that an inclusion of other functional strategies, purchasing category strategies and, astonishingly, the awarding strategy has been neglected within public procurement so far. None of the investigated papers investigates these dimensions as a main topic. Consequently, public procurement still needs to align the procurement strategy with other functional strategies (Venkatraman, 1989). Some general considerations may be provided by Lian and Laing (2004), who consider the purchasing of health services as a unit
of analysis for comparing the contract awarding approach and criteria used by public and private organization, but findings are quite limited and category-focused. In terms of other functional strategies, a threat between functional and procurement objectives becomes evident, with significant effects on the performance of an organization. At the same time a missing purchasing category strategy reveals that public procurement products or product groups are not connected with a higher procurement strategy; promising success potentials remain unexploited. A missing awarding strategy demonstrates a strategic gap of public procurement. Although procurement legislation represents a normative framework for public procurement, the existing awarding authorities are challenged to determine a unified procurement strategy for their organization.

The consideration of the methodology illustrated that research in the field of public procurement has a strong focus on procurement practice. Consequently, empirical research methods are used. The structured content analysis is able to show that procurement strategies currently concentrate on outsourcing and the implementation of policy goals as dimensions of public procurement. Finally, all dimensions of the analytical framework are at least explicitly mentioned within the investigated papers, even those dimensions are reflected that currently do not represent a main topic.

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Method</th>
<th>Supply environment</th>
<th>Make-or-buy decision</th>
<th>Political strategies</th>
<th>Other functional strategies</th>
<th>Supply chain design strategy</th>
<th>Category strategy</th>
<th>Awarding strategy</th>
<th>Process strategy</th>
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<td>+</td>
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<td>(4)</td>
<td>-</td>
<td>(4)</td>
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<td>(4)</td>
<td>-</td>
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<td>++</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
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<td>conceptional and empirical analysis of contracts</td>
<td>-</td>
<td>-</td>
<td>++</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
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<td>+</td>
<td>-</td>
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<td>+</td>
<td>+</td>
<td>++</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
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<td>Gith, A.M., Johnston, J.M., Hefetz, A. and Warner, M.E. (2012)</td>
<td>empirical interviews and survey</td>
<td>+</td>
<td>++</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Globerman, S. and Vining, A.R (1996)</td>
<td>conceptional</td>
<td>++</td>
<td>++</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>Empirical (case study and interviews)</td>
<td>+</td>
<td>++</td>
<td>(4)</td>
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Table 1: Findings from the systematic literature review
<table>
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<th>Category strategy</th>
<th>Awarding strategy</th>
<th>Process strategy</th>
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<td>-</td>
<td>(4)</td>
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<tr>
<td>Khalfan, M.M.A., McDermott, P.</td>
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<td>-</td>
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<td>(4)</td>
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<td>Conceptional</td>
<td>-</td>
<td>(+)</td>
<td>-</td>
<td>(4)</td>
</tr>
<tr>
<td>(1995)</td>
<td></td>
<td></td>
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<td>Londsdale, C., Kirkpatrick, I.,</td>
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<td>(4)</td>
<td>(4)</td>
<td></td>
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<tr>
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<td></td>
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<tr>
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<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>(2011)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Nabatchi, T. (2007)</td>
<td>Conceptional</td>
<td>-</td>
<td>+</td>
<td>(4)</td>
<td>-</td>
</tr>
<tr>
<td>Nollet, J. and Brasile, M. (2003)</td>
<td>Empirical interviews</td>
<td>-</td>
<td>+</td>
<td>-</td>
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</tr>
</tbody>
</table>

Table 1: continued
Driving a research agenda for public procurement

The debate on the strategic importance of procurement and thus on formulating procurement strategies mentioned in section 1 is still ongoing. The background and development of the intended strategy reflects an organisational shift to greater recognition of the potential contribution of purchasing within the public sector: the perceived success of purchasing in contributing to local economic development and environmental objectives provided the subsequent incremental shift to develop a procurement strategy aligned on several dimensions. So far, it is surprising that this discussion is very little referred to, when developing almost the same topic for the public sector. Given the already outlined high empirical relevance (procurement volumes of public procurement agencies), it is imperative not to leave the discussion about anchoring a public procurement strategy exclusively to the political-normative level. Strategy content has to be connected with methods of strategy development in terms of environmental, innovative and socially responsible objectives (Kahlenborn et al., 2011). For the outline of further research this work refers to widely accepted approaches, which distinguish between strategy process and strategy content research (Miller, 1989; Ketchen et al., 1996).

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Method</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<th>5</th>
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<td>-</td>
<td>(+)</td>
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<td>-</td>
<td>-</td>
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<tr>
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<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<td>(+)</td>
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<td>+</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
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<td>+</td>
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<td>Empirical (case studies)</td>
<td>(+)</td>
<td>-</td>
<td>-</td>
<td>++</td>
<td>+</td>
<td>-</td>
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<td>conceptional (theory based)</td>
<td>+</td>
<td>++</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
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<td>empirical (case studies and interviews)</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
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<td>empirical (case study)</td>
<td>(+)</td>
<td>-</td>
<td>(+)</td>
<td>+</td>
<td>-</td>
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</table>

**Legend**
- **+** is the main topic of the paper
- **(+) is explicitly considered within the paper
- **(++) is almost implicitly considered within the paper**

Table 1: continued
Strategy content of public procurement

Basically, a procurement strategy defines what and how a certain supply need will be met (Agndal & Nordin, 2008). This demand fulfillment concerns several dimensions of the applied analytical framework, in particular the make-or-buy decision, the supply chain design, the purchasing category and the awarding strategy (dimensions 2, 5, 6, 7). Recently, the focus of research on (industrial) procurement is on these strategy dimensions. Sourcing concepts, procurement portfolios, etc. provide important insights into the strategy content of the procurement function (Vane Weele, 2009). Other issues, for example about global sourcing or the design of supplier relationships, etc. play an important role in the outlined "how" procurement satisfies demand. On the one hand, strategy content provides guidance for the operational procurement processes and on the other hand, outlines how the procurement function contributes to the overarching organizational (firm) objectives. Surprisingly, purchasing category strategies (dimension 4) and awarding strategy (Dimension 6) are hardly discussed within the public sector. Further, the question of the alignment of procurement with other organizational functions (dimension 4), for example, in the context of an Early Purchasing Involvement is also rarely considered. Instead, the normative political settings dominate strategy content. In Europe - and thus even in Germany, which is subject to the public procurement regime of the European Union - these strategies are clearly defined (Kahlenborn, 2011): Public procurement must develop to become more supportive in the dimensions of social responsibility, environmental sustainability and the promotion of innovations. The idea is that public procurement contributes to the objectives of the overarching organization (European Union), which for instance promotes innovation that reduces environmental impacts and increase social standards following the framework of the EU 2020 strategy. A further example is North Rhine-Westphalia, where the federal government achieved the goal of higher social standards. This objective was fulfilled by means of a uniform minimum wage through public procurement initiatives (among other initiatives), as a new law for “tariff loyalty” and “public awards of contracts” was adopted.

Strategy process of public procurement

From the perspective of business administration, the scientific debate about the development process of public procurement strategies is too much dominated by procurement legislation and the strategy process is hardly discussed in business literature. This corresponds to the analysis of dimension 8 "process strategy", but also refers to the horizontal and vertical coordination processes (analysis dimensions 1, 3 and 4). The core of the strategy development process includes the decision-making process of an organization to determine the need for products or services, to identify and evaluate alternatives to meet the demand, and to select (Webster & Wind, 1972). Already in the 1990s, the strategy process was identified as a central element of strategy research (Petrigrew, 1992). In fact, only few sources deal with this issue and combine strategy process with the context of "governance", which is a necessary structural model to define rules, power and relationships to efficiently and effectively allocate financial, material or human resources (Fearn & Martinez, 2012; Gereffi et al. 2005). In the process of strategy formulation it is recommended to form cross-functional teams of all involved stakeholders. Only the stakeholders are able to evaluate the importance of purchasing categories in terms of different areas of the public sector and to discuss and develop objectives or strategic alternatives (Handfield, 2004).

Conclusion

Summarizing the results of the our literature review on strategy content and process significant deficits are in particular the lack of connectivity between the political strategy setting and the strategic contribution of public procurement, at least from the perspective of business administration. Currently, procurement strategies are defined by the policy and "given" by way of the public procurement law and its procurement agencies. The result is a top-down approach, which is also in political science (at least in its "pure form") not entirely uncontroversial (Sabatier, 1986).

As a result, political strategy objectives are named in the context of public procurement as "awarding-external aspects" (DIHK, 2007). These objectives are classified as "awarding-external" to public procurement because they serve the enforcement of general policy objectives. According to this, these objectives are not the primary business or macroeconomic objectives that attend (a) public procurement according to the principle of economy, (b) the restriction of market power of the public sector and (c) the liability of effective competition in the awarding of public contracts.

In fact, however, it is widely accepted that a strategic supply management must contribute to the strategic objectives of an organization (Large, 2009). Transferring this understanding of procurement strategy to the public procurement authorities, then formal (economic) goals do not longer dominate tangible (political) goals. So, for example, if the German Federal Government commits to reducing CO2 emissions as a strategic goal, public procurement must also contribute to this objective.

The problem, therefore, is not the existence of strategic (policy) goals and the fact that this must be taken into account by the procurement function. This is also reflected in the analysis dimension (3). The actual dominance of political strategies in the analyzed literature becomes evident. Further research is rather needed on the question of how a process looks like, that leads to the strategy definition.
The sketched top-down approach limits the influence of the public procurement function in terms of self-identified potentials (savings, performance) within the (political) strategy formulation. The deficits in purchasing category-and awarding strategies (dimensions 6 and 7) as well as the lack of alignment with other functional strategies (dimension 4) show the existence of insufficient interaction between the political and the level of procurement management. It is likely that this issue is still largely unexplored, because the analysis of political decision-making takes place in the political sciences. An important step would be the implementation of interdisciplinary research approaches to further explore strategic management of public procurement.

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Comparative Analysis of Public Procurement Efficiency under Different Regulation Regimes

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Abstract
The reform of budget-sector entities enables us to compare the impact of different types of public procurement regulations in budget and autonomous organizations in Russia. Such analysis is important in light of the critical discussion of the effects of current procurement regulation (94-FL), as well as taking into account the introduction of the Federal Contract System in 2014.

Using the difference-in-differences methodology, we shall consider public procurements of two national universities in 2011–2012. All procurements of the first university were regulated by the 94-FL requirements. Procurements of the second university were regulated by the 94-FL until June 2011. Later this university introduced its own Procurements Provision. A comparative analysis of procurements of these organizations enables us to estimate the impact of the different types of regulations on the effectiveness of public procurement, as measured by the level of competition and price decline in public tenders, as well as the timely execution of procurement contracts.

JEL Classification: H57.

Key words: public procurement, public organizations, institutional reforms, procurement effectiveness.
Introduction

The efficient organization of public procurements is an important task both for developed countries [1] and developing countries [2], and constitutes part of their economic activity. This is connected with the fact that public procurements account for some 10-15 percent of GDP in the first group and approximately 20 percent in the second group [3], [4].

The 2005 reform of the public procurement system, connected with the adoption of Federal Law 94-FL “On the Placement of Orders for Supply of Goods, Fulfillment of Works, Provision of Services for State and Municipal Needs”, was aimed at preventing abuses by officials of government customer organizations and enhancing competition during the process of selecting suppliers. These objectives have been emphasized many times in statements by government representatives and reports of the Federal Antimonopoly Service [5], [6]. The tools used for attaining those objectives consisted of strict and detailed regulation of government order placement procedures with a focus on selecting suppliers on the basis of lowest price and restricting the use of any qualitative criteria for evaluating bids. Active introduction of the practice of selecting suppliers via auctions was also supposed to boost competition (due to limiting the use of requests for quotations and tenders).

All these measures stimulated the growth of competition in the sphere of public procurement, but at the same time an analysis of the practice of applying 94-FL demonstrated that they led to a shift of corruption to other stages of the procurement cycle (planning and delivery) and generated numerous problems in fulfilling contractual obligations [7]. Subsequent and more detailed empirical studies showed that the problems with executing contracts (delays in fulfilling obligations or failure to execute them in full volume) occur more frequently in cases when the legislation restricts customers to apply qualification and business reputation criteria in process of choosing suppliers [8].

It should be noted, however, that this situation of excessively rigid regulation in the sphere of public procurement is not unique for Russia [9]. A broad survey of public procurement effectiveness in countries of the European Union conducted in 2011 that covered 5,500 government customers and 1,800 suppliers from 30 countries showed that procurement procedures in the private sector are on the whole evaluated as more flexible and more efficient when compared to the public sector. At the same time, the level of competition at auctions is lower in the private sector [10]. One of the factors of this competition decrease is the reputation of suppliers being taken into account. This creates a certain degree of inequality among the bidders, but at the same time it is conducive to better immediate procurement outcomes and creates long-term incentives for new potential suppliers to take part in tender procedures [11]. It should also be mentioned that the effectiveness of procurement procedures in the private sector does not lead to losses in quality during the execution of the contract, but allows it to remain at a comparative level with the public sector [12].

Discussions concerning the consequences adopting 94-FL in Russia resulted in a critical revaluation of approaches to procurement regulation. Specifically, the concept of the Federal Contract System (FCS), a draft law that was submitted to the State Duma (parliament) in 2012, envisages the spread of regulation to the contract planning and implementation stages with a simultaneous widening of the spectrum of procurement procedures that can be used by government customers. Considering the experience of 94-FL enforcement, it is apparent that the creation of FCS will take more than one year. At the same time, new approaches to procurement regulation are in practice already being applied now (before FCS formation), in part within the framework of reforming budget sector organizations.
Public sector reform in the Russian Federation envisages the introduction of different types of public sector organizations, including public institutions and enterprises, state budget-funded agencies, and autonomous organizations (Federal Law from 03 Nov 2006 N 174-FL “On Autonomous Organizations”, edited on 03 Dec 2012). According to the rule established for the latter type of public sector organizations, their procurements shall not fall within the scope of 94-FL, if the autonomous organization’s supervisory board adopts a special provision regulating the procurements of this autonomous organization. This provision was later prescribed by Article 2 of Federal Law 223-FL from 18 July 2011 “On the Procurement of Goods, Works, and Services by Some Types of Legal Entities.”. Such provisions were presumed to include procurement procedures and supplier selection mechanisms that take into account the specifics of a particular autonomous organization. Such implementation of “FCS elements” provides a good opportunity for comparing the consequences of applying old and new public procurement regulations, which constitutes the subject of this work.

Applying the difference-in-differences methodology [4] and using the analytical approach proposed by [8], this article analyzes the procurements of two budget sector universities during the period of 2011–2012. One of these organizations, which is a budget-sector institution, conducted its procedures in accordance with the provisions of 94-FL during the entire period under survey. The other organization, which is an autonomous organization, also conducted its procurements in accordance with 94-FL until July 2011, but afterwards adopted and enforced its own procurement provision. The comparison of these two organizations enables us to assess the impact of the shift to new regulation forms on the main public procurement effectiveness parameters, including the level of competition at auctions, economizing by price decreases at auctions, and execution of contracts.

The material of the article is organized in the following way: Part 1 offers a brief description of both organizations under review and the main changes in procurement procedures of the autonomous organization as a result of adoption of its own procurement provision; Part 2 contains a descriptive analysis of procurement data in both organizations during the period of 2011–2012; Part 3 builds on this analysis to formulate the main hypotheses and methodology of econometric research; Part 4 presents the results of regression analysis; and in the conclusion we present the main findings and recommendations for economic policy.

1. General Institutional Characteristics, Procurement Rules, and Procedures Used by the Organizations under Review

Our analysis is based on procurement data from two large public sector organizations for the period of 2011–2012. Both of the considered organizations are national research universities. Organization No.1 is a major university in Moscow, while Organization No.2 is a large regional Russian university. The scopes of their activity, which is represented by the number of contracts and their value, are comparable, although there are differences in the procurement structure.

The procurement activities of each of the compared organizations have their own specifics. Being an autonomous public institution, Organization No.1 enforced its own procurement provision in July 2011. At the same time, during the entire period in question, Organization No.2 remained a state budget-funded institution whose procurements were regulated by 94-FL.

There are many differences in procurement regulations under 94-FL and the procurement provision of Organization No.1. We shall highlight the most important ones. 94-FL actually provides for only four procurement methods, including tenders, auctions, requests for quotations, and single-source contracting, whereas the Provision on the Procurement of Goods, Works, and Services for the Needs of Organization No.1 envisages a wider selection
of procurement methods and some changes in their application terms. They include, among others, the following procedures (including in electronic form): open single-stage tenders, open single-stage tenders with prior qualification, open two-stage tenders, open tenders with rebidding, open auctions, requests for quotations, single-source contracts with a supplier (executor, contractor), including direct contracts; and procurements under simplified procedures.

The latter procurement method deserves special attention, as it accounts for a considerable share of Organization No.1’s contracts. Organization No.1 may use simplified procedures to make procurements in amounts not exceeding RUR 300,000, and information about the demand for goods, works, and services for the needs of the customer department is communicated to suppliers (executors, contractors) whose data are included in the annually compiled Organization’s Suppliers List. The List is compiled at the beginning of the year in three stages. First of all, suppliers with previous experience of fulfilling orders for this organization whose performance was satisfactory are included in the List. Stage two involves the placement of an electronic advertisement for any company interested in further participating in supplies under the simplified procedures and specializing in particular procurement areas to submit its reputation and qualification validation. At stage three, an additional invitation may be published for interested suppliers to participate in procedures for procurement areas with less than three contenders participating in the bids. The simplified nature of the procedures consists not only of restricted participation, with only those suppliers included in the list being admitted to auctions, but also in lesser amounts of required documents and shorter timelines for placing orders. This is a competition-based procedure, and the participant offering the lowest bid becomes the winner. Such an approach for renewing contracts can prove to be quite efficient from a theoretical point of view [13].

As compared to 94-FL, the procurement provision of Organization No.1 extends the possible grounds for single-source contracting. Along with implementing a set of procedures, more focus is made on requirements for the supplier in order to raise the quality of fulfilling contract concluded with Organization No.1 as the customer. In addition to this, a number of procedures (e.g. open tenders, auctions, requests for quotations) set certain restrictions on dumping: If a procurement contender’s bid contains an offer of a 25 percent decrease or more in the starting price of a contract, then it shall present a relevant substantiation. On the one hand, this condition restricts price competition, but on the other hand it reduces the risk of concluding a contract with an incompetent supplier. Moreover, expert control over the substantiation of the starting prices by customer departments was introduced in some priority procurement areas (including construction jobs, computer hardware procurements, security and fire alarm equipment), contributing to significant cost-savings before the start of the auction.

Therefore, Organization No.1’s adoption of its own procurement provision should presumably have an impact on both the competitiveness of procurement prices and on the quality of contract execution. These assumptions will be confirmed in the course of further analysis.

### 2. Inputs for Analysis and Comparison of the Main Procurement Parameters

The data set used for this analysis included the bulk of contracts concluded by both organizations in 2011–2012. This information was provided to us in the form of electronic tables by specialists in the procurement departments from both organizations, with the permission of their superiors. It should be mentioned at the same time that, as a result of the integration of the Ministry for Economic Development’s database of orders and the register of government contracts formed by the Federal Treasury, all the data used by us became available at the portal [www.zakupki.gov.ru](http://www.zakupki.gov.ru).
The procurement information provided to us included the following initial data:

- procurement method (request for quotations, open auctions, electronic auctions, tenders, simplified procedures, single-source contracting);
- quotation, tender, or auction number;
- contract subject;
- type of procured goods (works, services) based on the economic classification of budget expenditures;
- procurement budget (according to the tender documentation information card);
- name and code of the customer structural department in whose interest the procurement was made;
- number of bids filed for competition/lot, including the number of bids admitted for consideration, as well as the number of bidders in the auction;
- winner’s quoted bid;
- name of the supplier (executor, contractor);
- contract number;
- contract (agreement) conclusion date;
- contract (agreement) execution period;
- information on actual payments under the contract (time and amount).

In addition to the existing classification of goods, works, and services in the database, we also introduced another classification of procurements for purposes of further survey, based on provisions of the institutional search of goods, experience goods, and results from objective differences in quality evaluation opportunities. In addition, as Organization No. 1 has adopted its own procurement provision, a relevant variable reflecting this event was entered in the database.

Taking into account the available empirical data characteristics, the effectiveness of procurement procedures for the considered public organizations can be estimated along such parameters as the share of orders (by the number of contracts and their value) placed through competition procedures, the competition at auctions, and the price decrease during the auction. Contract execution issues can be measured on the basis of delays in fulfilling obligations (share of contracts with delays in execution and average duration of such delays).

To characterize the procurement activities of both organizations, it should be noted that despite the similarity in their profile and academic status, their procurement volumes differ, but are still comparable. We reviewed 1,656 contracts with a total value of 4.146 billion rubles concluded by Organization No. 1 during the period in question, and 1,335 contracts with a total value of 1.196 billion rubles concluded by Organization No. 2. The sample did not include contracts concluded with a single-source supplier of utility services (heat and electric

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1 See [14] and [15], and also [16]. The quality characteristics of the first group of “search goods” can be set prior to the contract conclusion and checked at the point of delivery. Cement or stationery are examples of such goods. The quality characteristics of the second group of “experience goods” can be set before the conclusion of the contract, but generally they can be checked only at the time of consumption, i.e. after the contract has been concluded. Such goods include food products or heating line repair jobs. Finally, the qualitative characteristics of the third group of “credence goods” often cannot be set by the customer independently even in the process of using the purchased goods, works, and services and fulfillment of the contract. The evaluation of the quality of such goods generally requires special expert assessment. Examples of “credence goods” include medical or educational services. In accordance with this classification, different procurement procedures are recommended for different types of goods.
power supply, water supply, sanitation, etc.). These contracts were excluded from the survey as in their case there is no point in analyzing price decreases and compliance with terms of obligation fulfillment. It should also be mentioned that two specific especially large construction contracts were also excluded from the analysis of procurements for Organization No.1 in order to avoid bias in econometric evaluations.

The number of contracts concluded by Organization No.1 and Organization No.2 in 2011 and 2012 remained approximately at the same level and was slightly above 800 contracts annually for the former and 650 contracts annually for the latter organization (see Table 1). The average value of one contract in these organizations varied more substantially, totaling some 2.5 million rubles in Organization No.1 and 0.9 million rubles in Organization No.2. The values of these indicators practically did not change during the two years in question.

<table>
<thead>
<tr>
<th>Organization</th>
<th>Contract conclusion year</th>
<th>Number</th>
<th>Total value (RUR million)</th>
<th>Average value (RUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization No. 1</td>
<td>2011</td>
<td>818</td>
<td>2,067.44</td>
<td>2,527,435.50</td>
</tr>
<tr>
<td></td>
<td>2012</td>
<td>838</td>
<td>2,068.87</td>
<td>2,468,824.00</td>
</tr>
<tr>
<td>Organization No. 2</td>
<td>2011</td>
<td>681</td>
<td>597.81</td>
<td>877,843.13</td>
</tr>
<tr>
<td></td>
<td>2012</td>
<td>654</td>
<td>598.63</td>
<td>915,337.31</td>
</tr>
</tbody>
</table>

*Table 1:* Number of contracts concluded by Organization No. 1 and Organization No. 2 in 2011–2012 and their total value

The monthly dynamics of changes in the number of concluded contracts in both organizations is characterized with a strongly pronounced seasonal nature – the number of concluded contracts increased in the period from October to December. For example, approximately 7–8 percent of the total amount of contracts concluded in the period in question falls in December for Organization No. 1, while this figure stands at some 11–13 percent for Organization No. 2 (see Fig. 1 and 2). However, the dynamics of change presented in terms of value for Organization No. 2 are less season-based.

*Figure 1:* Distribution of contracts concluded by Organization No. 1 by the number of contracts and value per month, %
In Organization No. 1, 29 percent of contracts concluded accounts for goods (11 percent of the procurement value), 5 percent for works (18 percent of the procurement value), and 66 percent for services (71 percent of the procurement value) (see Table 2). In Organization No. 2, 61 percent of contracts concluded accounts for goods (89 percent of the procurement value), 6 percent for works (5 percent of the procurement value), and 33 percent for services (6 percent of the procurement value) (see Table 2).

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Goods</th>
<th>Works</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of contracts concluded</td>
<td>number</td>
<td>%</td>
<td>number</td>
</tr>
<tr>
<td>Organization No.1</td>
<td>481</td>
<td>29</td>
<td>87</td>
</tr>
<tr>
<td>Organization No.2</td>
<td>816</td>
<td>61</td>
<td>78</td>
</tr>
<tr>
<td>Total value of concluded contracts and deals (procurement budget), RUR million</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization No.1</td>
<td>448.72</td>
<td>11</td>
<td>758.83</td>
</tr>
<tr>
<td>Organization No.2</td>
<td>1061.25</td>
<td>89</td>
<td>59.71</td>
</tr>
</tbody>
</table>

Table 2: Distributions of contracts by the type of procurements: goods / works / services

The largest share of procurements both in terms of quantity and in terms of value for both organizations falls within the broad category of experience goods, and the smallest category in terms of value is search goods for Organization No. 1, and credence goods for Organization No. 2 (Table 3).

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Search goods</th>
<th>Experience goods</th>
<th>Credence goods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of contracts concluded</td>
<td>number</td>
<td>%</td>
<td>number</td>
</tr>
<tr>
<td>Organization No.1</td>
<td>472</td>
<td>28</td>
<td>1058</td>
</tr>
<tr>
<td>Organization No.2</td>
<td>296</td>
<td>22</td>
<td>787</td>
</tr>
<tr>
<td>Total value of concluded contracts and deals (procurement budget), RUR million</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization No.1</td>
<td>375.21</td>
<td>9</td>
<td>2946.24</td>
</tr>
<tr>
<td>Organization No.2</td>
<td>80.59</td>
<td>7</td>
<td>1091.96</td>
</tr>
</tbody>
</table>

Table 3: Distribution of contracts by type of procured goods: search / experience / credence goods
Further analysis was conducted with account for Organization No. 1’s implementing its own procurement provision in July 2011. The database for this organization is divided accordingly into two parts: before and after July 2011. A descriptive analysis is also made separately for each of these two periods. As Organization No. 2 remained a budget organization during 2011–2012 and its procurements were carried out in accordance with 94-FL, analysis of this organization will be conducted simultaneously for the whole sample.

The situation with delayed contracts undoubtedly underwent better changes in Organization No. 1. Before August 2011, contracts with delays in execution accounted for about 15–20 percent of all concluded contracts, while in the subsequent period they accounted for only 3–7 percent (except two “problem” months in May 2011, which saw 46 percent of contracts delayed, and January 2012, which had 26 percent of contracts delayed contracts) (Figure 3).

<table>
<thead>
<tr>
<th>Month</th>
<th>Share of delayed contracts</th>
<th>Share of contracts with delays exceeding 30 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>January-11</td>
<td>5%</td>
<td>10%</td>
</tr>
<tr>
<td>February-11</td>
<td>10%</td>
<td>15%</td>
</tr>
<tr>
<td>March-11</td>
<td>15%</td>
<td>20%</td>
</tr>
<tr>
<td>April-11</td>
<td>20%</td>
<td>25%</td>
</tr>
<tr>
<td>May-11</td>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td>June-11</td>
<td>30%</td>
<td>35%</td>
</tr>
<tr>
<td>July-11</td>
<td>35%</td>
<td>40%</td>
</tr>
<tr>
<td>August-11</td>
<td>40%</td>
<td>45%</td>
</tr>
<tr>
<td>September-11</td>
<td>45%</td>
<td>50%</td>
</tr>
<tr>
<td>October-11</td>
<td>50%</td>
<td>55%</td>
</tr>
<tr>
<td>November-11</td>
<td>55%</td>
<td>60%</td>
</tr>
<tr>
<td>December-11</td>
<td>60%</td>
<td>65%</td>
</tr>
</tbody>
</table>

**Figure 3**: Distribution of the share of delayed contracts for Organization No. 1 per month

The situation with delays in Organization No. 2 was rather stable during the entire period (Figure 4). With the exception of three problem months, the share of delayed contracts was approximately 10–20 percent or less.

<table>
<thead>
<tr>
<th>Month</th>
<th>Share of delayed contracts</th>
<th>Share of contracts with delays exceeding 30 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>January-12</td>
<td>5%</td>
<td>10%</td>
</tr>
<tr>
<td>February-12</td>
<td>10%</td>
<td>15%</td>
</tr>
<tr>
<td>March-12</td>
<td>15%</td>
<td>20%</td>
</tr>
<tr>
<td>April-12</td>
<td>20%</td>
<td>25%</td>
</tr>
<tr>
<td>May-12</td>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td>June-12</td>
<td>30%</td>
<td>35%</td>
</tr>
<tr>
<td>July-12</td>
<td>35%</td>
<td>40%</td>
</tr>
<tr>
<td>August-12</td>
<td>40%</td>
<td>45%</td>
</tr>
<tr>
<td>September-12</td>
<td>45%</td>
<td>50%</td>
</tr>
<tr>
<td>October-12</td>
<td>50%</td>
<td>55%</td>
</tr>
<tr>
<td>November-12</td>
<td>55%</td>
<td>60%</td>
</tr>
<tr>
<td>December-12</td>
<td>60%</td>
<td>65%</td>
</tr>
</tbody>
</table>

**Figure 4**: Distribution of the share of delayed contracts for Organization No. 2 per month
During the two years under survey, Organization No.2 used four types of procurement procedures: single-source contracting, requests for quotations, open tenders, and electronic auctions. Tenders were used only twice for sufficiently large contracts. Organization No.1 used the same types of procedures before the introduction of its own procurement provision. It is noteworthy that from the point of view of volumes (both in terms of quantity and in terms of value, presented as a percent) the characteristics of these procedures in both organizations are comparable. For example, 30 percent of procurements of Organization No.2 were made from a single source (7.8 percent of the overall value), and 19 percent of the procurements of Organization No.1 were made by the same method (8 percent of the overall value) (Table 4). The largest share of procurements of both organizations was made through electronic auctions: 44 percent for Organization No.1 (81 percent in terms of value), and 50 percent for Organization No.2 (90 percent in terms of value).

After Organization No.1 adopted its own procurement procedure the number of forms of procurement procedures it used increased, adding to the list of procedures open auctions, electronic quotations, simplified procedures, and direct contracts. The simplified procedure turned out to be the most popular method of procurement, with 27 percent of all procurements being made through this procedure, but as it was applied only to contracts of small value, it accounted for a mere 2 percent of the total value of all contracts concluded in the period from July 2011 to December 2012 (Table 4). Another procurement procedure spread widely after Organization No.1 enforced its own procurement provision is single-source contracting. These procurements accounted for 26 percent of contracts and 49 percent of the overall value. Procurements of a sufficiently high value are also often made through open auctions, accounting for 15 percent of the total quantity of procurements and 30 percent of the overall value.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Organization No. 1 (94-FL)</th>
<th>Organization No.1 (own Procurement Provision)</th>
<th>Organization No.2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Num. % RUR mln</td>
<td>Num. % Num. % RUR mln</td>
<td>Num. % Num. % RUR mln</td>
</tr>
<tr>
<td>Open tender</td>
<td>12 4 35.8 6</td>
<td>43 3 195.4 5.5</td>
<td>2 0.1 4.5 0.4</td>
</tr>
<tr>
<td>Open auction</td>
<td>0 0 0</td>
<td>209 15.5 1062 30</td>
<td>0 0 0</td>
</tr>
<tr>
<td>Electronic auction</td>
<td>131 44 475.4 81</td>
<td>16 1 150.6 4</td>
<td>668 50 1070.4 89.5</td>
</tr>
<tr>
<td>Request for quotations</td>
<td>99 33 26.3 5</td>
<td>339 25 185.6 5</td>
<td>265 19.9 27.1 2.3</td>
</tr>
<tr>
<td>Electronic request for quotations</td>
<td>0 0 0</td>
<td>27 2 15.3 0.5</td>
<td>0 0 0</td>
</tr>
<tr>
<td>Simplified procedure</td>
<td>363 27 84.1 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single-source contracting</td>
<td>59 19 46.5 8</td>
<td>354 26 1737 49</td>
<td>400 30 94.2 7.8</td>
</tr>
<tr>
<td>Direct contract</td>
<td>6 0.5 126 4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 4: Distribution of contracts by the procurement method*

A comparison of competition procedures in Organization No.1 and Organization No.2 during the period when their procurement activities were regulated by 94-FL shows that the degree of competitiveness of procurements in both organizations was at an average level – the tender procedures of both organizations involved, as a rule, about two bidders (Table 5). Only one bidder participated in the tenders of Organization No.1, which suggests a total lack of competitiveness during the period under survey. However, price decreases were observed as a result of tenders – by 11 percent on average. An analysis of the tendering procedure used by Organization No.2 is of no interest due to the insufficient size of the sample. The most significant price decrease was achieved at electronic auctions (28 percent in Organization No.1, and 15 percent in Organization No.2). However, the price
decreased more frequently in the process of requesting quotations (for Organization No.1 this comprised 88 percent of all contracts concluded through requests for quotations, while for Organization No.2 this number is 90 percent).

It should be mentioned that when the organizations under consideration acted within the framework of 94-FL the share of contracts executed with delays was approximately at the same level in respect to all procurement procedures: 26–33 percent for Organization No.1 and 8 percent for Organization No.2. The average period of delays in both organizations was some 40 days.

After Organization No.1 adopted its own procurement provision the situation with delays significantly improved — the maximum share of delayed contracts did not exceed 11 percent for contracts concluded through electronic auctions (Table 5). At the same time, the competitiveness of the procedures dropped to an average of 1.5–1.9 bidders. The amount of economizing due to price decreases at tenders also diminished; the share of procedures where price decreases were registered went down insignificantly in cases of requests for quotations (from 88 percent to 80 percent) and, on the contrary, increased in cases of electronic auctions (from 61 percent to 69 percent).

<table>
<thead>
<tr>
<th>Organization Procurement method</th>
<th>Tender</th>
<th>Open auction</th>
<th>Electronic auction</th>
<th>Request for quotations</th>
<th>Electronic request for quotations</th>
<th>Simplified procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average contract value (RUR thou)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization No.1 (94-FL)</td>
<td>2985</td>
<td>3629</td>
<td>266</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization No.1 (own Procurement Provision)</td>
<td>4545</td>
<td>5094</td>
<td>9414</td>
<td>547</td>
<td>568</td>
<td>231</td>
</tr>
<tr>
<td>Organization No.2</td>
<td>2273</td>
<td>1052</td>
<td>102</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average number of bidders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization No.1 (94-FL)</td>
<td>1</td>
<td>2.41</td>
<td>2.30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization No.1 (own Procurement Provision)</td>
<td>1.23</td>
<td>1.51</td>
<td>1.69</td>
<td>1.59</td>
<td>1.89</td>
<td>1.59</td>
</tr>
<tr>
<td>Organization No.2</td>
<td>1</td>
<td>1.53</td>
<td>2.43</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share of tenders with price decreases (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization No.1 (94-FL)</td>
<td>75</td>
<td>61</td>
<td>88</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization No.1 (own Procurement Provision)</td>
<td>63</td>
<td>48</td>
<td>69</td>
<td>80</td>
<td>96</td>
<td>77</td>
</tr>
<tr>
<td>Organization No.2</td>
<td>100</td>
<td>37</td>
<td>90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average price decrease (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization No.1 (94-FL)</td>
<td>11</td>
<td>28</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization No.1 (own Procurement Provision)</td>
<td>7</td>
<td>13</td>
<td>3</td>
<td>8</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Organization No.2</td>
<td>4</td>
<td>15</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share of contracts with delays in execution (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization No.1 (94-FL)</td>
<td>33</td>
<td>31</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization No.1 (own Procurement Provision)</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>9</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>Organization No.2</td>
<td>0</td>
<td>8</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average delays in execution (days)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization No.1 (94-FL)</td>
<td>11</td>
<td>47</td>
<td>36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization No.1 (own Procurement Provision)</td>
<td>95</td>
<td>29</td>
<td>0</td>
<td>16</td>
<td>31</td>
<td>1</td>
</tr>
<tr>
<td>Organization No.2</td>
<td>0</td>
<td>38</td>
<td>44</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5: Comparative characteristics of procurements via competitive procedures

The most significant price decreases (over 30 percent) were registered in cases of electronic auctions for Organization No.1 (94-FL) (24 percent of contracts were concluded by this method) and in cases of requesting quotations for Organization No.2 (9 percent of contracts) (Tables 6 and 8). Following the transfer of Organization
No. 1 to its own procurement provision the scope of price decrease became much less significant, and the price of the contract over all procedures began to decrease, as a rule, by not more than 5 percent of the starting price (Table 7).

<table>
<thead>
<tr>
<th>Level of decrease</th>
<th>Tenders</th>
<th>Electronic auctions</th>
<th>Requests for quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>number</td>
<td>%</td>
<td>number</td>
</tr>
<tr>
<td>No decrease</td>
<td>3</td>
<td>25</td>
<td>51</td>
</tr>
<tr>
<td>(0.2) % decrease</td>
<td>1</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>(2.5) % decrease</td>
<td>2</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>(5,10] % decrease</td>
<td>3</td>
<td>25</td>
<td>4</td>
</tr>
<tr>
<td>(10,20] % decrease</td>
<td>2</td>
<td>17</td>
<td>16</td>
</tr>
<tr>
<td>(20,30] % decrease</td>
<td>1</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>Over 30% decrease</td>
<td>0</td>
<td>0</td>
<td>31</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>100</td>
<td>131</td>
</tr>
</tbody>
</table>

*Table 6: Distribution of contracts by scope of price decrease at auction, depending on the procurement method (Organization No.1, 94-FL)*

<table>
<thead>
<tr>
<th>Level of decrease</th>
<th>Tenders</th>
<th>Open auctions</th>
<th>Electronic auctions</th>
<th>Requests for quotations</th>
<th>Electronic Requests for quotations</th>
<th>Simplified procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Num.</td>
<td>%</td>
<td>Num.</td>
<td>%</td>
<td>Num.</td>
<td>%</td>
</tr>
<tr>
<td>No decrease</td>
<td>16</td>
<td>37</td>
<td>108</td>
<td>52</td>
<td>5</td>
<td>31</td>
</tr>
<tr>
<td>(0,2] % decrease</td>
<td>8</td>
<td>18</td>
<td>29</td>
<td>14</td>
<td>7</td>
<td>44</td>
</tr>
<tr>
<td>(2,5] % decrease</td>
<td>5</td>
<td>12</td>
<td>15</td>
<td>7</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>(5,10] % decrease</td>
<td>7</td>
<td>16</td>
<td>15</td>
<td>7</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>(10,20] % decrease</td>
<td>5</td>
<td>12</td>
<td>18</td>
<td>9</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>(20,30] % decrease</td>
<td>2</td>
<td>5</td>
<td>13</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Over 30% decrease</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
<td>100</td>
<td>209</td>
<td>100</td>
<td>16</td>
<td>100</td>
</tr>
</tbody>
</table>

*Table 7: Distribution of contracts by scope of price decrease at auction, depending on the procurement method (Organization No.1, own procurement provision)*

<table>
<thead>
<tr>
<th>Level of decrease</th>
<th>Tenders</th>
<th>Tenders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>number</td>
<td>number</td>
</tr>
<tr>
<td>No decrease</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>(0.2] % decrease</td>
<td>1</td>
<td>50</td>
</tr>
<tr>
<td>(2,5] % decrease</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>(5,10] % decrease</td>
<td>1</td>
<td>50</td>
</tr>
<tr>
<td>(10,20] % decrease</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>(20,30] % decrease</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Over 30% decrease</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>2</td>
<td>100</td>
</tr>
</tbody>
</table>

*Table 8: Distribution of contracts by scope of price decrease at auction, depending on the procurement method (Organization No.2)*

### 3. Main Hypotheses and Methodology of Empirical Study

An analysis of changes in the autonomous institution’s procurement procedures as compared to 94-FL and a comparison of the main procurement parameters of the two public institutions under survey leads to the formulation of the following hypotheses:
1) The autonomous institution’s procurement provision introduces new procedures for selecting suppliers on the basis of business reputation criteria (e.g., a “simplified procedure”, with the placement of orders among suppliers formerly successful in meeting their obligations under contracts with this public institution). We therefore assume that transferring to the institution’s own procurement provision would lead to a relative decrease in competition at auction. This means that the number of auction participants in competitive procedures at Organization No.1 will drop after the adoption of its own procurement provision.

2) To prevent “dumping” the autonomous institution’s procurement provision introduces requirements for the supplier to provide additional substantiation of its capability to execute the order with adequate quality in the event of a more than 25-percent price decrease as compared to the starting price. Therefore, we assume that after Organization No.1 transfers to its own procurement provision the price at the auction will decrease less significantly. In some procurement areas this may also be a consequence of expert control of the substantiation of starting prices by customer departments envisaged by the in-house regulations of Organization No.1.

3) A wider use of qualification and business reputation criteria by Organization No.1 after the transfer to its own procurement provision should stimulate the lowering of default risks under the concluded contracts. Therefore, we assume that after Organization No.1 transfers to its own procurement provision the average period of delays in fulfillment of obligations will decrease, as well as the share of contracts where such delays occurred.

We will test the formulated hypotheses on the basis of previously proposed and piloted methodological approaches to analyzing auction price decreases and overall procurement effectiveness, as well as contract execution problems [8], [10]. Our regression models will use the following dependent variables:

- the number of bidders participating in competitive procurement procedures;
- contractual price decreases as a result of auctions (% of starting price);
- period of delays in contract execution (days).

Using relevant control variables, we included in our models the procurement method (quotations, auctions, tenders, simplified procedures, and single-source contracting), the type of procured goods based on the “works/goods/services” and Nelson-Durby-Karni classifications, the procurement budget (or the contract value for hypothesis 3), the contract period, order placement quarter, and the quarter of its delivery. The regressor for the number of bidders will be added to models characterizing the factors of auction price decreases, and the regressor for auction price decreases under relevant contracts will be added to the models that analyze delays in contract execution. In the latter model, in cases of single-source contracting, the auction price decrease is accepted as zero. As all dependent variables are continuous, the analysis will use linear regression models evaluated by the least-squares method. To address the problem of heteroscedasticity of disturbances in the estimated models, we used White estimators for standard deviations (as more robust but consistent ones). As the budget of the bid (contract value) is included as an independent factor in all models under review and its value is by several orders of magnitude greater than the value of dependent variables, the hypothesis concerning the inclusion of this factor in logarithmic form was accepted on the basis of the Box-Cox test. As already mentioned above, Organization No.2 used tenders quite seldom. In order to avoid inconsistent estimates of coefficients before a relevant factor, these observations were excluded from all models. A full list of variables used in the regression analysis and their descriptive statistics are presented in Tables P1 and P2 in the Appendix.
The effect of Organization No.1 adopting its own procurement provision will be estimated on the basis of the difference-in-differences methodology [4]. The main points of the difference-in-differences methodology are as follows. Two similar objects (in our case, Organization No.1 and Organization No.2) and two periods of time (in our case, before and after Organization No.1 adopted its own procurement provision, with both objects operating in identical conditions in the first time period) are selected. In the second period of time, the first object was subjected to certain treatment, and the second object was not. If we are interested in the change of some parameter for the first object in the second period of time as compared to the first period, the difference can be connected both with the treatment effect and with a change in external conditions not related to the specified treatment. The survey of the second object is aimed precisely at helping us understand whether there has been a change in external conditions, and, if there has been, to estimate this change. Assessment of the treatment effect for the first object by the difference-in-differences method consists of the following: comparing the values that characterize the changes in the second period as compared to the first one in the parameter of interest for the first and second objects, and their difference, yields the treatment effect for the first object (the change effect isolated from external conditions).

4. Results of Regression Analysis

The results of estimation models characterizing the level of tender competition are presented in Tables 9 and 10.

To estimate the treatment effect, a dummy variable was included in all models – the indicator of effect for Organization No.1’s own procurement provision (the second half of 2011 and the whole year of 2012; we additionally will check whether it is possible to equate the three half-year periods comprising the corresponding time intervals).

According to the presented data, Organization No.1’s adoption of its own procurement provision led to a decrease in the number of bidders – the relevant coefficient in models 3 and 4 is negative and is significant at the 1% level. At the same time, the dummy variable reflecting Organization No. 1’s introduction of its own procurement provision is insignificant for Organization No.2. These results confirm hypothesis 1 formulated above. The levels of $R^2$ in the estimation results are quite low. It can be dealt with heterogeneity of procurements. Unfortunately, data constraints do not enable us to estimate the same models for any single procurement good. In order to control the types of procurements, we use different classifications, but regardless it does not cover all varieties and specifics of goods.

<table>
<thead>
<tr>
<th>Model number</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model type</td>
<td>Linear</td>
<td>Linear</td>
<td>Linear</td>
<td>Linear</td>
</tr>
<tr>
<td>Procurement description</td>
<td>Set of variables included in the model</td>
<td>Dependent variable</td>
<td>Dependent variable</td>
<td></td>
</tr>
<tr>
<td>Type of procured good according to the Nelson - Darby - Karni classification</td>
<td>Search goods</td>
<td>Reference category</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Experience goods</td>
<td>0.033</td>
<td>0.041</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Credence goods</td>
<td>-0.266**</td>
<td>-0.321***</td>
<td></td>
</tr>
<tr>
<td>Type of procurement according to the standard Russian classification</td>
<td>Goods</td>
<td>Reference category</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Works</td>
<td>0.41**</td>
<td>0.392**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Services</td>
<td>-0.03</td>
<td>-0.026</td>
<td></td>
</tr>
<tr>
<td>Method of procurement</td>
<td>RFQ</td>
<td>Reference category</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 9: Estimation results for competitiveness model in Organization No.1 for non-single source procedures

<table>
<thead>
<tr>
<th>Model number</th>
<th>Model 5</th>
<th>Model 6</th>
<th>Model 7</th>
<th>Model 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model type</td>
<td>Linear</td>
<td>Linear</td>
<td>Linear</td>
<td>Linear</td>
</tr>
<tr>
<td>Procurement description</td>
<td>Set of variables included in the model</td>
<td>Dependent variable</td>
<td>Number of bidders</td>
<td>Number of bidders</td>
</tr>
<tr>
<td>Type of procured good according to the Nelson - Darby - Karni classification</td>
<td>Search goods</td>
<td>Reference category</td>
<td>Experience goods</td>
<td>-0.152</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Credence goods</td>
<td>-0.753***</td>
</tr>
<tr>
<td>Type of procurement according to the standard Russian classification</td>
<td>Goods</td>
<td>Reference category</td>
<td>Works</td>
<td>0.746**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Services</td>
<td>-0.187*</td>
</tr>
<tr>
<td>Method of procurement</td>
<td>RFQ</td>
<td>Reference category</td>
<td>Tenders</td>
<td>Excluded</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Open Auction</td>
<td>Absent</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Electronic auctions</td>
<td>-0.913***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Simplif. procedures</td>
<td>Absent</td>
</tr>
<tr>
<td>Period of procurement</td>
<td>1 – 2 quarter 2011</td>
<td>Reference category</td>
<td>3 – 4 quarter 2011</td>
<td>-0.124</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 – 2 quarter 2012</td>
<td>0.573</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 – 4 quarter 2012</td>
<td>-0.030</td>
</tr>
<tr>
<td>Quarter of delivery</td>
<td>I</td>
<td>Reference category</td>
<td>II</td>
<td>0.168</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>III</td>
<td>0.048</td>
</tr>
</tbody>
</table>

* *, **, *** - the coefficient is significant at 10 percent, 5 percent, or 1 percent, respectively.
Table 1b: Estimation results for competitiveness model in Organization No.2 for non-single source procedures

An analysis of price decreases for competitive procedures shows that the introduction by Organization No.1 of its own procurement provision did not impact the decrease of auction prices (models 11 and 12 in Table 11). The coefficient of the dummy variable reflecting the Organization No.1’s adoption of its own procurement provision in similar models calculated for Organization No.2 (see Table 12) is also insignificant. These findings partially agree with hypothesis 2.

<table>
<thead>
<tr>
<th>Contract duration (days)</th>
<th>IV</th>
<th>-0.127</th>
<th>-0.087</th>
<th>-0.240*</th>
<th>-0.204</th>
</tr>
</thead>
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<tr>
<td>Logarithm of the budget of the bid Thousand rubles</td>
<td>-0.0066</td>
<td>0.0017</td>
<td>0.0043</td>
<td>0.0139</td>
<td></td>
</tr>
<tr>
<td>Procurement Provision adopted in Organization 1 Procurement Provision</td>
<td>0.135</td>
<td>0.168</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-value test of equality periods of procurement</td>
<td>0.13</td>
<td>0.12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of observations</td>
<td>929</td>
<td>929</td>
<td>929</td>
<td>929</td>
<td></td>
</tr>
</tbody>
</table>

*, **, *** - the coefficient is significant at 10 percent, 5 percent, or 1 percent, respectively

<table>
<thead>
<tr>
<th>Model number</th>
<th>Model 9</th>
<th>Model 10</th>
<th>Model 11</th>
<th>Model 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model type</td>
<td>Linear</td>
<td>Linear</td>
<td>Linear</td>
<td>Linear</td>
</tr>
<tr>
<td>Procurement description</td>
<td>Set of variables included in the model</td>
<td>Dependent variable</td>
<td>Dependent variable</td>
<td></td>
</tr>
<tr>
<td>Dependent variable</td>
<td>Price reduction</td>
<td>Price reduction</td>
<td>Price reduction</td>
<td>Price reduction</td>
</tr>
<tr>
<td>Type of procured good according to the Nelson - Darby - Karni classification</td>
<td>Search goods</td>
<td>Reference category</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experience goods</td>
<td>2.80***</td>
<td>2.68***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Credence goods</td>
<td>2.72*</td>
<td>2.59*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of procurement according to the standard Russian classification</td>
<td>Goods</td>
<td>Reference category</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Works</td>
<td>0.631</td>
<td>0.327</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services</td>
<td>3.038***</td>
<td>2.93***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Method of procurement</td>
<td>RFQ</td>
<td>Reference category</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenders</td>
<td>2.33*</td>
<td>2.76**</td>
<td>2.34*</td>
<td>2.79**</td>
</tr>
<tr>
<td>Open Auction</td>
<td>2.39**</td>
<td>2.47**</td>
<td>2.57**</td>
<td>2.65**</td>
</tr>
<tr>
<td>Electronic auctions</td>
<td>4.03**</td>
<td>4.02**</td>
<td>3.93**</td>
<td>3.94**</td>
</tr>
<tr>
<td>Simplif. procedures</td>
<td>-0.718</td>
<td>-0.718</td>
<td>-0.48</td>
<td>-0.47</td>
</tr>
<tr>
<td>Period of procurement</td>
<td>1 – 2 quarter 2011</td>
<td>Reference category</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 – 4 quarter 2011</td>
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</tr>
<tr>
<td>1 – 2 quarter 2012</td>
<td>-0.18</td>
<td>-0.156</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 – 4 quarter 2012</td>
<td>-2.13</td>
<td>-2.16*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quarter of delivery</td>
<td>I</td>
<td>Reference category</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>1.32</td>
<td>1.48</td>
<td>1.55</td>
<td>1.72</td>
</tr>
<tr>
<td>III</td>
<td>2.27**</td>
<td>2.45**</td>
<td>1.67</td>
<td>1.85*</td>
</tr>
<tr>
<td>IV</td>
<td>3.43***</td>
<td>3.67***</td>
<td>2.47***</td>
<td>2.68***</td>
</tr>
<tr>
<td>Number of bidders</td>
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</table>
Table 1: Estimation results for price reduction models (in percent) for Organization No.1

<table>
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<th>Model 13</th>
<th>Model 14</th>
<th>Model 15</th>
<th>Model 16</th>
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<td>Linear</td>
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<td>Procurement description</td>
<td>Set of variables included in the model</td>
<td>Dependent variable</td>
<td>Dependent variable</td>
<td>Dependent variable</td>
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<td>Reference category</td>
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<td>Tenders</td>
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<td>4.70***</td>
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<td>0.022***</td>
<td>0.017***</td>
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*, **, *** - the coefficient is significant at 10 percent, 5 percent, or 1 percent, respectively

Table 2: Estimation results for price reduction models (in percent) for Organization No.2
The analysis of delays in public procurement contracts shows that Organization No.1’s enforcement of its own procurement provision resulted in a decrease in delays by 7 days on average (see Table 13). At the same time, the effect of enforcement by Organization No.1 of its own procurement provision in models for Organization No.2 is insignificant. Therefore, the results of regression analysis for both organizations do not contradict hypothesis 3. The problem of a low $R^2$ level in the models can be due to specifics of procurement goods, as well as contract specifics. The latter may include prepayments, financial provisions, and other guaranteeing requirements for the supplier, which we do not control for here.

<table>
<thead>
<tr>
<th>Model number</th>
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<td>Linear</td>
<td>Linear</td>
<td>Linear</td>
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<td>Dependent variable</td>
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<td>Reference category</td>
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<td></td>
</tr>
<tr>
<td>Experience goods</td>
<td>1.24</td>
<td>1.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Credence goods</td>
<td>1.12</td>
<td>1.10</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>Goods</td>
<td>Reference category</td>
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</tr>
<tr>
<td>Works</td>
<td>20.00***</td>
<td>20.67***</td>
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<td>Services</td>
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<td>RFQ</td>
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<tr>
<td>Tenders</td>
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<td></td>
</tr>
<tr>
<td>3 – 4 quarter 2011</td>
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</tr>
<tr>
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<td>0.09</td>
<td>0.12</td>
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* *, **, *** - the coefficient is significant at 10 percent, 5 percent, or 1 percent, respectively

Table 13: Public procurement contract delay models: estimation results for Organization No.1
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<td>Reference category</td>
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<td>Tenders</td>
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<td>0.810*</td>
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<td>Percent of price reduction</td>
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<td>-0.019</td>
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</tr>
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*, **, *** - the coefficient is significant at 10 percent, 5 percent, or 1 percent, respectively

Table 14: Public procurement contract delay models: estimation results for Organization No.2

5. Conclusion

The authors of this work, relying on a large empirical dataset for two large state universities, estimate the effect of introducing new approaches to regulating public procurements, which are to be developed in full measure in the process of creating the Federal Contract System. Specifically, we tried to find out to what degree extending opportunities of government customers during the transfer from the status of a budget institution to the status of an autonomous organization impacts the level of tender competition and price decrease during the placement of orders
the fulfillment of obligations under the concluded contracts. Basing our study on an analysis of provisions of 94-FL and the procurement provision of the considered autonomous organization, we assumed that extending the spectrum of used procurement procedures and the possibility of using additional qualification and business reputation criteria would lead to a decrease in competition and lesser price reductions, but also to a better execution of obligations.

To test the formulated hypotheses, we employed difference-in-differences methodology by comparing the effect for the autonomous organization, which introduced considerable changes to its procurement regulations, and for the budget institution, which conducted its procurements on the basis of 94-FL. It should be noted that substantial differences in these organizations’ procurement structures constituted an objective restriction for our analysis, despite the comparability of their volumes. Nevertheless, these differences have no impact on the significance of the findings.

The findings partially substantiated our hypotheses. Specifically, we revealed that the enforcement of the autonomous institution’s own procurement provision resulted in a decrease of the number of bidders and in much less delays of contract execution. At the same time, zero effect was registered at the budget institution considered as the benchmark. Moreover, as far as price reduction analysis is concerned, no significant effect of the enforcement of the autonomous institution’s own procurement provision was registered in either of the two organizations.

It is clear that our findings need additional verification based on a wider sample of data that includes more than two organizations, as well as employing non-parametric econometrics to cover the non-linearity of some factors. Nevertheless, we can state that the offered approach enables us to make a quantitative measurement of the effects of introducing new procurement regulation mechanisms. Therefore, this approach can be applied in practice by regulatory authorities, principal administrators of budget funds, and major organizations who are government customers for analyzing the results of piloting the introduction of individual FCS elements.

Acknowledgements
This paper has been prepared as part of the project “Comparative Analysis of Public Procurement Effectiveness”, supported by the Basic Research Program of the Higher School of Economics in 2014.

References


Annex

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<th>percent</th>
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</tr>
<tr>
<td>Quarter of delivery</td>
<td>I</td>
<td>111</td>
<td>6.7</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>245</td>
<td>14.79</td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>292</td>
<td>17.63</td>
</tr>
<tr>
<td></td>
<td>IV</td>
<td>1008</td>
<td>60.87</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1656</td>
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</tr>
<tr>
<td>Number of bidders</td>
<td>Min = 1, Max = 12, Average = 1.53, Median = 1, Standard deviation = 1.01</td>
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<td></td>
</tr>
<tr>
<td>Contract duration (days)</td>
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<td></td>
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<tr>
<td>Budget of the bid (RUR)</td>
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<td></td>
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<tr>
<td>Delay (in contract delivery, days)</td>
<td>Min = 0, Max = 369, Average = 3.45, Median = 0, Standard deviation = 19.9</td>
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</tr>
<tr>
<td>Auction price decrease (%)</td>
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<td></td>
</tr>
<tr>
<td>Own Procurement Provision</td>
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<td>1355</td>
<td>81.82</td>
</tr>
<tr>
<td></td>
<td>0 - No</td>
<td>301</td>
<td>18.18</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1656</td>
<td>100</td>
</tr>
</tbody>
</table>

a) The variable is categorical. In the estimated models, these variables were replaced by a set of dummy variables.
For example, the “method of procurement” variable was replaced with the variables “auctions” (a value of 1 was given if there was an auction during the order placement and 0 if otherwise), “tenders” (a value of 1 was given if there was a tender during the order placement and 0 if otherwise). Quotations were used as the reference category.

Table P1. Description of variables for Organization No. 1
<table>
<thead>
<tr>
<th>Variable</th>
<th>Values</th>
<th>number</th>
<th>percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of procured good according to the Nelson - Darby - Karni classification&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Search goods</td>
<td>296</td>
<td>22.17</td>
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<tr>
<td></td>
<td>Experience goods</td>
<td>787</td>
<td>58.95</td>
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<tr>
<td></td>
<td>Credence goods</td>
<td>252</td>
<td>18.88</td>
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<td><strong>Total</strong></td>
<td>1335</td>
<td>100</td>
</tr>
<tr>
<td>Type of procurement according to the standard Russian classification&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>816</td>
<td>61.12</td>
</tr>
<tr>
<td></td>
<td>Works</td>
<td>78</td>
<td>5.84</td>
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<td>Services</td>
<td>441</td>
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<td><strong>Total</strong></td>
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<td>100</td>
</tr>
<tr>
<td>Method of procurement&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Quotations</td>
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<td>19.85</td>
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<td>Electronic auctions</td>
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<td></td>
<td>Tenders</td>
<td>2</td>
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<td></td>
<td>Single-source contracting</td>
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<td><strong>Total</strong></td>
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<td>100</td>
</tr>
<tr>
<td>Period of procurement&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1 – 2 quarter 2011</td>
<td>185</td>
<td>13.85</td>
</tr>
<tr>
<td></td>
<td>3 – 4 quarter 2011</td>
<td>496</td>
<td>37.15</td>
</tr>
<tr>
<td></td>
<td>1 – 2 quarter 2012</td>
<td>124</td>
<td>9.28</td>
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<td></td>
<td>3 – 4 quarter 2012</td>
<td>530</td>
<td>39.70</td>
</tr>
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<td></td>
<td><strong>Total</strong></td>
<td>1335</td>
<td>100</td>
</tr>
<tr>
<td>Quarter of delivery</td>
<td>I</td>
<td>96</td>
<td>7.19</td>
</tr>
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<td></td>
<td>II</td>
<td>113</td>
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<td></td>
<td>III</td>
<td>225</td>
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<tr>
<td></td>
<td>IV</td>
<td>391</td>
<td>29.49</td>
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<tr>
<td></td>
<td><strong>Total</strong></td>
<td>1335</td>
<td>100</td>
</tr>
<tr>
<td>Number of bidders</td>
<td>Min = 1, Max =23, Average = 1.77, Median =1, Standard deviation = 1.39</td>
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<td>Auction price decrease (%)</td>
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<td></td>
<td>0 - No</td>
<td>185</td>
<td>13.86</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>1335</td>
<td>100</td>
</tr>
</tbody>
</table>

<sup>a</sup> The variable is categorical. In the estimated models, these variables were replaced by a set of dummy variables. For example, the “method of procurement” variable was replaced with the variables “auctions” (a value of 1 was given if there was an auction during the order placement and 0 if otherwise), “tenders” (a value of 1 was given if there was a tender during the order placement and 0 if otherwise). Quotations were used as the reference category.

Table P2. Description of variables for Organization No. 2
Essential Aspects of Public Procurement Reform Processes – Lessons Learned From Namibia

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1. INTRODUCTION

The Namibian Government has acknowledged the necessity to reform their currently applicable public procurement regulations quite a while ago [1]. There have been several cases that have disclosed the inadequacy of the tender board regulations and the Namibian government has repeatedly stressed the need for a new tender law. The Tender Board has often been criticised as not fulfilling its mandate and being corrupt, exemptions of the tender regulations have ballooned in the recent years, there is a lack of transparency and an independent review mechanism has been called for. Based on field research in Namibia, these allegations are examined by assessing the respective legal provisions, case law and the results of field research conducted in Namibia. Some of the effects of these shortcomings are outlined by means of examples. An analysis of the whole Namibian procurement system would extend the scope of this article, hence basically shortcomings which are outstanding, severely hindering socio-economic development and that might be of specific relevance for other procurement systems and reforms are outlined and discussed.

The reform process has been on-going for more than ten years [2]. However, a result has not yet been produced. Different drafts have been shared with research institutions and other stakeholders and it was promised that the bill was due for approval in 2012 [3] and the same in 2013 [4]. But such promises weren’t delivered on. Reasons for this lengthy process might offer advice in regard to issues that have to be considered in order to carry out a successful and timely reform. Hence, the Namibian reform proceedings are critically analysed in the context of suggested best practices. The lessons learned from the Namibian case study are not only important for other reform projects but also for the general discussion on procurement law.

First, particular shortcomings of the Namibian procurement system are assessed. After discussing the organisational structure and the allocation of responsibilities, including the constitution and the responsibilities of the tender boards, the role of the procuring entities and the matter of contract management, the scope of the tender law is analysed with a special focus on exemptions. Thereafter procurement-specific transparency regulations, anti-corruption regulations as well as control mechanisms are assessed. The first part is then completed with a conclusion.

The second part focusing on the reform process in Namibia is started with best practices in regard to steps and stages of public procurement reforms. Then, the Namibian reform process is outlined. The instrument of comparative law and model laws as applied and obstacles in the reform process. After recent developments have been examined, this part ends with a conclusion. Finally, the lessons learned from Namibia are presented.

2. SHORTCOMINGS OF THE NAMIBIAN PROCUREMENT SYSTEM

The current applicable procurement law in Namibia is governed by the Tender Board of Namibia Act 1996 (in the following: Tender Board Act), the Tender Board Regulations of 1996, regulations for the Regional Tender Boards and the Local Tender Boards as well as the Code of Procedure of 1997.
The key institutions in the Namibian procurement system are the tender boards. Apart from the State Tender Board, there are tender boards on the regional and on the local level. They carry out public procurement for the government offices, ministries, agencies, departments, sections and divisions and are solely responsible for the award decision.

The national Tender Board is composed of the Permanent Secretary of the Ministry of Finance (sec 3(1)(a) Tender Board Act) and one staff member from the Office of the Prime Minister, the Office of the President, each ministry and different agencies. The agencies include the Namibian Security Intelligence Agency, the National Planning Commission, the Office of the Attorney-General, the Office of the Auditor General, and the Office of the Parliament. The members are nominated by the president, prime minister and responsible ministers (sec 3(1)(b) Tender Board Act). As has become obvious during field research, in practice the permanent secretaries of the Ministries serve as board members. All these people are government employees and legislation does not require them to have any experience in or knowledge of public procurement. It could be argued that these are political appointments for rather technical jobs that require a certain expertise (Interview Mr Hopwood, Director of the Institute for Public Policy Research, 26th March 2013). And indeed, considering the public administration, legal, technical and economic skills and understanding needed to efficiently and effectively carry out procurement[5][6], the lack of qualification criteria for tender board members is highly problematic and allows the appointment of members that hinder rather than implement effective and efficient procurement decisions. Apart from internal members, two Namibian citizens, who are no staff members, are appointed by the Ministry of Finance (sec 3(1)(c) Tender Board Act). Legislation lacks qualification requirements in this respect as well. Additionally, the Minister appoints an alternate member for each member of the Board as a replacement during absence or time of inability to act (sec 3(2) Tender Board Act). Usually, directors, deputy directors, under-permanent secretaries within the Ministry of the permanent secretary, deputy-permanent secretaries or financial advisors are selected as alternate members (Interview Mrs Jonga, Chief Control Officer of the Tender Board, 26th March 2013; Interview Mr Immanuel, Alternate Member of the Tender Board, 27th March 2013). According to the interviews the alternate members attend the tender board meetings more often than the tender board members themselves (Interview Mr Titus, Alternate Member of the Tender Board, 28th March 2013; Interview Mr Shindinge, Alternate Member of the Tender Board, 27th March 2013). The administrative work of the Board is carried out by staff members designated by the permanent secretary from among the staff of the Ministry of Finance (sec 18(1) Tender Board Act).

The Tender Board is subdivided in three divisions: administration or secretariat, inspection and training, and the actual board. The secretariat is the arm of the board; it prepares the board meetings, notifies the tenders, maintains the contact with the relevant ministries and checks compliance of tender documents. The division inspection and training trains line ministries and tenderers in tender submission, inspects low-key tenders and is responsible for capacity building. It, for example, trains the local and regional offices in public procurement. Currently, the whole tender structure consists of about 50 persons. Several of the interviewees stated that there is an overload of work and that the staff members are overburdened and have to work over-hours (Interview Mrs Jonga, Chief Control Office of the Tender Board, 26th March 2013; Interview Mr Shindinge, Alternate Member of the Tender Board, 27th March 2013; Interview Mr Isaacs, Chief Control Officer of the Tender Board, 26th March 2013). The institution would need streamlining in order to be able to work more efficiently (Interview Mrs Jonga, Chief Control Office of the Tender Board, 26th March 2013). It has to be indicated in this respect that the whole procurement system in Namibia is still solely paper-based which contributes to the overload of work for the tender board staff and its members (Interview Mrs Jonga, Chief Control Office of the Tender Board, 26th March 2013). The International Monetary Fund (IMF) noted already in 2008 in the Namibian Country Report that “(i) the capacity and professional skills of the tender board staff is limited, half of the established posts are vacant, and there is a heavy workload as a result of low threshold (N$10,000) for issue of tenders; (ii) the tender board still works in a manual mode, as the processes and records are yet to be computerized; (iii) the line ministries may need strengthened guidelines and capacity building on how to screen bids and make recommendations […]”[7].

One Tender Board member admitted finding it problematic that the Tender Board has ordinary clerks for highly difficult but low-paid jobs with a lot of money involved (50% of the GDP) (Interview Mrs Jonga, Chief Control Office of the Tender Board, 26th March 2013). Public procurement-relevant experience or expertise is not required
by board and staff members. There is neither introductory nor regular training for employees of the Tender Board. The previous permanent secretary of the Tender Board initiated a training carried out by the Southern Business School, a South African company which offers a diploma course on Supply Chain Management. About four members of the Tender Board attended the training which is accredited by the Qualification Authorities of Namibia. However, according to an interviewee, this was the only training carried out in the past years (Interview Mr Isaacs, Chief Control Officer of the Tender Board, 26th March 2013). The lack of expertise and experience also runs the risk that staff members hesitate to take decisions because they are scared of making incorrect decisions and losing their job.

The system of alternate members who serve in the board if the permanent secretary cannot attend a meeting involves challenges such as the necessity for exchange of information between the member and the alternate member about preceding meetings. Moreover, the amount of work the Tender Board members face is enormous. Apart from the weekly meetings on Friday the Board additionally meets as required and the meetings also need to be prepared (Interview Mr Immanuel, Alternate Member of the Tender Board, Alternate Member, 27th March 2013). Tender documentations have to be reviewed and evaluated in order to take decisions. It has to be emphasized that the Permanent Secretaries and the alternate members have other jobs and tasks and that the work for the Tender Board is additional work, since no member is working full-time for the Tender Board.

It also has to be remarked that many permanent secretaries chair ministerial committees which make recommendations to the Tender Board under Article 19(1) of the Code of Procedure. This is deficient since it is important that the decision is taken by another person than the recommendation. Moreover, it is quite common that ministers have been serving in government for quite a long time being shifted from one ministry to another. (According to Section 4 of the Tender Board Act, the members of the Tender Board who are employed by the government hold office for the tenure of the Minister and all other members are appointed for a period of three years. Reappointment is possible and the Minister has the power to remove members from the board if the person is considered to be unsuitable.) The Tender Board can, hence, be signified as a largely exclusive group of people with a disproportionate amount of influence [8].

The role of the procuring entities

As suggested above the involvement of the procuring entities by giving recommendations to the Tender Boards has turned out to be taking place on a thin line between mere rubber-stamping of the recommendation through the Tender Board and decision-making based on the Tender Board members applying their own mind. According to Sec 18(2) of the Tender Board Act, the Board can “require a staff member of any other ministry or of any office or agency to assist the Board with the evaluation of any tender or to make recommendations to the Board in connection with any tender”. This is further specified in Section 2(2) of the Tender Board Regulations which provides that the Board may, in performing its functions, obtain such expert or technical advice as it may deem necessary. Sec 19(1) of the Code of Procedure further states, that the board shall after having opened and listed all tenders, submit the tenders to the relevant office, ministry or agency for its recommendation.

In practice, this provision has turned out to be problematic and led to several judicial disputes. The courts have clarified that the award decision has to be taken by the tender board and not by the advising ministry (see e.g. Disposable Medical Products v Tender Board of Namibia 1997 NR 129 (HC)). In several cases the award decision was set aside because the Tender Board had acted ultra vires by mere rubber-stamping the recommendation obtained from the respective ministry (Disposable Medical Products v Tender Board of Namibia 1997 NR 129 (HC), CSC Neckartal Dam Joint Venture v The Tender Board of Namibia & Others (A 109/2013 and A 76/2013) [2013] NAHCMD 186, Minister of Education and Others v Free Namibia Caterers (Pty) Ltd (SA 37/2010) [2013] NASC 8, AFS Group Namibia (Pty) Ltd v Chairperson of the Tender Board of Namibia and Others (A 55/2011) [2011] NAHC 184). It often seems that bid evaluation is carried out by the Ministries rather than the Tender Board itself (Interview Mrs Jonga, Chief Control Officer of the Tender Board, 26th March 2013). As stressed by Mr Titus, an alternate member of the Tender Board, (Interview, 28th March 2013) the evaluation would be made by the Ministries because they have the needed knowledge and expertise. It was confirmed by Tender Board members that the recommendations by the Ministries are usually followed but it was also emphasized that those recommendations are scrutinized and that the board is under no obligation to follow the recommendation (Interview Mr Titus, Alternate Member of the Tender Board, 28th March 2013; Interview Mr Shindinge, Alternate Member of the
Tender Board, 27th March 2013). There would be no rubber-stamping of recommendations by the board (Interview Mr Titus, Alternate Member of the Tender Board, 28th March 2013). If, for example, the higher bid is selected from two equal tenders, there is no substance to the matter and the recommendation is not followed (Interview Mrs Jonga, Chief Control Officer of the Tender Board, 26th March 2013). Mrs Jonga also explained that, in cases where the recommended tender is not the lowest, the permanent secretary needs to certify that the recommendation is made in the best interest of the Government and represents best value to the Government. There are also instances where the recommendation is sent back to the Ministry for clarification, as has been pointed out by Mr Titus. According to Mrs Jonga, reasons for not following recommendations are usually uncertainty or vagueness of the recommendation or non-conformity with the law. The Board, rather than evaluating the bids itself, looks for inconsistencies in the Ministry’s recommendation and if it finds irregularities, it applies its mind independently. This was stressed by Mr Immanuel, an alternate member of the Tender Board (Interview, 27th March 2013). And Mr Titus reported that it happened frequently that the recommendations are not followed, “Today (at today’s board meeting) at least two of the recommendations were not followed” (Interview, 28th March 2013).

It could be alleged that the fact that the Tender Board relies on the recommendation of the line ministry, especially if it comes to technical tenders, might be a system error rather than insufficient implementation. It has to be stressed that most of the members most probably have scarce knowledge, expertise or experience with technical issues of such tenders plus have an overload of work but bear the responsibility for the award decision and, hence, for the successful implementation of the contract. Indeed it is important that the recommendation by the Ministry came about according to the law and is fair and reasonable. According to members of the Tender Board, the Tender Board contests or overrules the recommendation, if the recommendation by the Ministry has not followed the principles of fairness and reasonableness and this would happen on a frequent basis. However, despite these contrary substantiations of the tender board members, rubber-stamping of recommendations seems to happen frequently as case law reveals. The overload of work of the Tender Board as well as exertion of political influence apparently still lead to mere rubber-stamping of recommendations by the ministries. And the exercise of political influence on the decision-making process often does not result in the selection of the best tender.

Contract management

Whereas the Tender Boards are solely responsible for the public procurement process until the award of the contract, there is no obligation to monitor contract implementation. Contract management is not addressed in the Namibian public procurement legislation at all. After the award of a tender it is the line ministries responsibility to monitor the implementation of the contract and the Ministry of Labour is the responsible institution to inspect the labour conditions and ensure adherence to the labour laws (Interviews with Mr Titus and Mr Immanuel) [9]. The Ministry of Works and Transport is responsible to monitor and evaluate capital projects. The ministries can, nevertheless, if they notice irregularities approach the Tender Board to decide what to do about the issue and consider cancellation of the contract as well as a blacklisting of the company (Interviews with Mrs Jonga and Mr Isaacs). It was stated that such processes had taken place, but usually because of a failure to implement the contract, respectively to carry out the project, and not because of other irregularities such as non-adherence to labour conditions or social security laws. The IMF found in 2008 that the performance of awarded tenders is not being monitored on a sufficiently regular basis [10].

The following example shows the effects of the lack of regulating contract management and assigning clear responsibilities to this respect. Tenders, especially in the construction sector [11], have been often awarded to Chinese companies, which have been subject to severe criticism. According to an interview conducted with a representative from the construction sector (Interview Mr Agenbag, Commercial Director of Murray & Roberts Namibia, 7th March 2013), 80% of the Construction projects have been awarded to Chinese companies in the past years. Not only insufficient labour conditions [12], the importation of Chinese workers [13] but also subsequent price corrections have led to antagonism [14]. The Permanent Secretary, when averted to cases where Chinese companies do not meet local labour laws, stressed that it was the Ministry of Labour’s task rather than the Tender Board’s to ensure legal compliance [15]. This view was also confirmed by the interviewees that are members of the board (Interview Mr Titus and Mr Immanuel).

A report of the Ministry of Labour and Social Welfare from 2006 provides that the government is aware that most of the Chinese companies were not operating according to the provisions of the Labour Act of 1992 and were
neither paying minimum wages nor adhering to other basic conditions of employment [16]. Furthermore, the Labour Commissioner criticized Chinese companies for their failure to comply with Namibian laws [17]. Despite this awareness, the government has still not ensured that Chinese companies adhere to local laws. Besides ignorance of wages and working conditions, Namibian construction companies claim that some Chinese companies import labour despite it is prohibited to use foreign labour if the work can be done by local workers. Whereas for Namibian companies there would be a lot of control whether all workers have a work permit (and it would be difficult to obtain a work permit for foreign workers!), it seems that the labour commissioner turns a blind eye on the working sites of the Chinese companies (Interview Mr Agenbag).

It is also stated that the majority of Namibians employed by Chinese contractors are not registered with the Social Security Commission, although this is required by law [18]. Moreover, Chinese companies would have, regularly since 1998, been awarded tenders despite not possessing a compliance certificate in terms of the Affirmative Action Employment Act of 1998 [19]. This Act has been enacted (as stated in the Preamble of the Act), *inter alia*, to achieve equal opportunity in employment and to redress through the conditions of disadvantage in employment experienced by persons in designated groups arising from past discriminatory laws and practices. Chinese companies would, as has been discovered during the tender evaluation of the new Head Office of the Ministry of Lands and Resettlement, allegedly misrepresent their number of employees on tender documents to avoid being required to produce Affirmative Action Certificates [20]. This contradicts the law which prohibits the state to enter into any contract with a relevant employer not holding the certificate (sec 42 of the Affirmative Action Employment Act).

As mentioned above, the Tender Board disclaims any responsibility to ensure companies’ adherence to laws when implementing contracts from tender awards, but sees the respective Ministries responsible for contract administration; although the latest tender documents include adherence to certain laws as contract conditions. The lack of clearly assigning responsibilities in respect to contract management leads to inaction in this respect and renders the whole process of contract management ineffective.

**SCOPE OF THE LAW**

The scope of the Tender Board Act covers the procurement of all goods and services, the letting or hiring of all things, the acquisition or granting of all rights and the disposal of all property by offices, ministries and agencies for or on behalf of the Government (sec 21(1) of the Tender Board Act).

Goods, services and property which are related to security are exempted from the Act (sec 21(a) of the Tender Board Act). Furthermore, the Namibian Defence Force and the Namibian Security Intelligence Agency are explicitly stated as not having to procure, hire, let, or dispose according to the provisions of the Tender Board Act (sec 21(a)). Exemptions for security reasons are quite common in public procurement systems and follow *a raison d’être*. Several procurement regulations allow for exemptions from the application of the rights and obligations in cases of procurement indispensable for national security. These include for example the Government Procurement Agreement of the World Trade Organization, the COMESA Procurement Regulations as well as the South African and the Mauritian procurement system. South Africa does not provide for a general exemption for security-related procurement but allows the Minister to grant exemptions for such procurements (sec 3 of Preferential Procurement Policy Framework Act 2000). This model is preferable to an overall exemption and accommodates that cases that cannot be procured under the public procurement legislation, for example because of confidentiality, can be procured through other means. The 2011 UNCITRAL Model Law on Public Procurement offers an alternative approach. It does not allow for exemptions for security reasons but allows the application of single-source procurement if the use of any other method of procurement is not appropriate for the protection of essential security interests of the State (Art 30(5)(d)). This has the advantage that procurement relating to national security does not take place in a legal limbo but is conducted under public procurement legislation and might, hence, be preferable to the overall exemptions from procurement legislation.

Moreover, the Namibian legislation (sec 17(a) and (b) of the Tender Board Act) provides for exemptions in which deviations from the generally prescribed open bidding are allowed. This includes cases in which the estimated value does not exceed N$ 10 000 and if the opposite party to an agreement to be entered into is a statutory body, local authority or regional council, a foreign government, etc. Whereas these exceptions seem reasonable, difficulties arise from Subsection b of Article 21 which exempts *such category of procurement, letting, hiring, rights or dis-
posal as may on the recommendation of the Board, be prescribed”. Of particular relevance in this regard is Section 17(1)(c) of the Tender Board Act which allows the Board to except from the regular tender procedure of the Act any particular case if it for good cause deems it impracticable or inappropriate to invite tenders. The Tender Board is, thereby, provided with a carte blanche to conduct transactions without following the tender procedure outlined in legislation. In practice, granting of exemptions is non-transparent and there are no clearly stated criteria when an exemption can be used. It is impossible to comprehend what tenders are exempted from the Act and, especially, on what reasons. According to Mr Schulz, Director of a Namibian construction company (Namibia Construction (Pty) Ltd; Interview on 22th March 2013)), the Tender Board provides the weirdest reasons for exemptions and he admitted that his company has also been given projects that had not been advertised.

Whereas all tenders under the Targeted Intervention Program for Employment and Economic Growth (TIPEEG), an employment creation program initiated in 2011 by the National Planning Commission as a response to the unemployment crisis in September 2009, are exempted from the normal procedure, they generally still follow open advertised bidding but with limited time periods (Interviews with Mrs Jonga, Mr Shindinge, Mr Titus). The exemption of a TIPEEG project still has to be granted by the Tender Board, meaning that the line ministries have to ask the Tender Board for the exemption of those projects, as Mrs Jonga explained. Moreover, despite the National Planning Commission is dealing with TIPEEG tenders, they usually still go through the Tender Board. Nevertheless, certain other exceptions seem to exist. According to tender board members and staff (Interviews with Mr Shindinge, Mr Isaacs, Mr Immanuel), exemptions are otherwise granted for urgent procurements and for procurements of utilities and travel allowances and of specific items. Justifying the ballooning of tender exemptions in the 2007/2008 financial year with an increase of 112.2 % compared to the previous year, the Minister of Trade and Industry, who was the Chairman of the Tender Board at that time, said in the report, “This increase in exemption approval could be attributed to factors such as urgent construction of and extensions to classrooms due to the exceptionally high demand for classrooms in the Khomas and northern regions for the ever-increasing number of learners”[21]. It was also mentioned by Mr Isaacs that a lack of financial planning for each annual year leaves the ministries with money to be spent at the end of the year. He stated that the Tender Board would especially in this time receive a lot of applications for exemptions by ministries and would mostly grant those exemptions so that the money can be spent. An alternate member of the Tender Board (Interview Mr Titus) classified the public resentment about exemptions as, at least partly, a problem of misunderstanding because the public would not understand that the above mentioned exemptions “make up quite a big share of the cake”. Another Tender Board member (Interview Mr Shindinge), however, admitted that sometimes exemptions are granted because there is an overload of work. Additionally, scandals such as the uncovering of an ‘urgent’ purchase of alcohol glasses, garden tools and kitchen utensils on Christmas Eve by the Ministry of Defence [22] exemplify that the broad discretion to grant exemptions is utilized shamelessly for the disadvantage of the tax payer.

The Act does not provide for any exemptions in respect to international agreements. Many states exclude projects funded by external donors from the application of the Act. Although the Act is silent on this matter, it might be assumed that donor-funded projects are not treated under the Act in practice. The issue of exemptions for projects funded by external donors is of particular importance in the Namibian context since it is closely related to the role of China which is known to provide soft-loans for infrastructure projects with the condition attached that the project is carried out by a Chinese company [23]. However, the interviews with the Tender Board members disclosed that there is no awareness that projects that have been financed by external donors are generally exempted from open bidding. Nevertheless, members of the construction sector have commented otherwise. They are of the opinion that projects financed by China have indeed attached the condition that it is carried out by their own companies and are not advertised for tender. According to a study conducted by the Labour Resource and Research Institute a wide range of projects such as low cost housing, schools, clinics, borehole drilling, irrigation, an aquaculture research centre, and the new State House have been implemented with economic aid from China [24]. As mentioned above, according to Agenbag from the construction company Murray & Roberts Namibia (Interview on 7th March 2013), about 80% of the tenders in the construction sector are awarded to Chinese companies. In 2009, it was estimated to be between 60 and 70% [25]. Public construction projects implemented by Chinese companies include, inter alia, the Supreme Court, the new head office for the Ministry of Lands and Resettlement and the new building for the Ministry of Finance. This, however, can have a negative impact on the domestic industry since it diminishes the size of the contestable national procurement market [26].

It is also known that many other external donors and international financial institutions require projects funded by them to be procured according to their own regulations [27]. An OECD/DAC survey yielded that in 2010 in Namib-
ia only 14 per cent of aid reported for the government sector used the Namibian procurement system [28]. It can be assumed that the Tender Board is not informed about such cases, what would explain why the Tender Board members are not aware of any exemptions for externally-funded projects.

Several stakeholders have stated that exemptions are the major problem of the current procurement system. According to the Tender Board Annual Reports in the 2005/2006 financial year tenders worth N$619 million were approved and tenders worth N$170.4 million were exempted from tender procedures. In the following financial year tender exemptions worth N$1.6 billion by far exceeded awarded tenders which valued N$868.3 million. The last annual report available so far for the period 2007/2008 states that tenders amounting to N$3.4 billion were exempted and N$624.4 million worth tenders were awarded.

The exemption from tender procedures in respect of the procurement of goods and services has become rampant and seems to evade the whole public procurement system. The current legislation on exemptions is insufficient since it is non-transparent, provides no alternative procurement methods for exempted procurements and, thereby, gives leeway for corruption and misuse. It would be necessary to find adequate procurement methods according to the type and value of the products or services to be procured. Although the Ministry of Finance is aware of the problem of exemptions and it would have the power, it has never issued any regulations in respect to the specification of situations in which exemptions are justified or what alternative tender procedures should be followed if tenders are exempted from the normal procedure. This is most probably due to a lack of political will; no one want to commit to anything that could mean a loss of power and influence and the tender exemption clause is assumed to be used for their own benefits (Interview Mr Hopwood).

TRANSPARENCY REGULATIONS

Specific procurement-related transparency provisions

Namibian legislation covers some basic publishing requirements but often does not satisfy a high transparency standard that enables an effective and efficient procurement system. It is required to publish the invitation of tenders once in the Government Gazette and at least once in each of the newspapers that are contracted by the Government (sec 11 Tender Board Act). It has however long been common practice to publish tenders in the Gazette only after the tenders have expired which renders its objective to provide potential bidders with the possibility to hand in tenders ineffective [29]. Nevertheless, nowadays the tender adverts as well as tender awards are published regularly on the Ministry of Finance’s webpage which is commendable and should be incorporated as publication requirement into the new bill. Important for the effective and efficient functioning of a public procurement system is also the immediate notification of the acceptance or rejection of tenderers and the possibility for tenderers to be provided with reasons for the acceptance or rejection. This is provided for in section 16 of the Tender Board Act. But it seems that the Tender Board has, in some instances, circumvented this provision by explicitly stating in the instructions to tenderers that only the successful tenderer will be notified [30]. There have also been other cases with limited transparency in the process, such as the reluctance to publish prices [31]. This means that the tender board has in some cases not been adhering to the applicable tender legislation, revealing that there are shortcomings not only in the public procurement regulations but also the implementation of law.

Disclosure of the evaluation criteria and method is a key requirement for an effective and efficient procurement system. It is seen as basic requirement for facilitating transparency and fairness. Moreover, it is important in order to provide the opportunity for potential suppliers or contractors to prepare bids in view of the evaluation criteria and method. Namibian legislation does not require the publishing of evaluation criteria. Nevertheless, the Tender Board has to keep record of reasons for accepting another than the lowest tender (sec 15(6) Tender Board Act). There is, however, no indication that the reasons have to be published and the public can only get access to the records if it requests the board to provide reasons or in the context of court proceedings. Legislation provides different criteria affecting the award decision of tenders (see 15 Tender Board Act, sec 40 of the Tender Board Regulations, sec 20 Code of Procedure). It is unclear to what degree they influence the award decision and how they are weighed to each other. Moreover, the law does neither specify nor restrict criteria which can influence the award decision of the board. In combination with the missing requirement of specifying the evaluation criteria in the title of tender, this constitutes a severe breach of transparency of the evaluation of tenders and the award decision. It can be concluded that the Namibian legislation regarding evaluation, comparison and acceptance of tenders is non-transparent and ambiguous. It is neither for the tenderers and the wider public comprehensible how tenders are evaluated and
awarded, nor is the Tender Board provided with clear and unambiguous guidelines. This severely undermines the efficiency and effectiveness of tendering and constitutes a massive breach of transparency. It creates a range of opportunities for abuse that can hardly be detected and traced.

Failure of board members to disclose a direct or indirect interest in a tender or an agreement is an offence that can be penalized with a fine of not more than N$ 500 000 and/or an imprisonment for not more than 10 years (sec 6(3) Tender Board Act). On the regional and local level such penalty is limited to N$ 2 000 and respectively 6 months (sec 5(2) Local Tender Board Regulations and sec 5(2) Regional Tender Board Regulations). The difference of the penalty threshold and the maximum imprisonment is astonishing, since regional or local procurement might also involve high amounts of money and it is unclear why offences by regional and local officials seem to be less severe. Further, more extensive provisions on the integrity and accountability of public procurement officials are needed.

Tjirera from the Institute for Public Policy Research (IPPR) e.g. suggests the introduction of a code of conduct including provisions dealing with the disclosure of assets and interests of procurement officials [32].

Non-procurement specific transparency and anti-corruption regulations

Namibia is part of several regional and international transparency and anti-corruption instruments. It has, inter alia, signed and ratified the UN Convention on Corruption, and the SADC Protocol against corruption. Nevertheless, it has in 2013 in the Corruption Perceptions Index by Transparency International received a score below 50 out of 100 (lowest level of corruption) which suggests that there are severe shortcomings in transparency and accountability and corruption is still a major hindrance and has not yet been addressed successfully. Namibia scored 48 and was ranked 57th out of 176 countries [33].

Apart from domestic procurement specific provisions aiming at transparency and counteracting corruption, there are other laws in this respect. Worth mentioning are the Code of Conduct for Regional Councils of 2004 and the Anti-Corruption Act of 2003. The former contains a list of requirements for the behaviour of members of the regional council as well as for the relationship with communities, between the members and with other staff members. Furthermore, the Code provides for an internal review mechanism which allows the suspension of members if it is found that a member has acted contrary to the code. There is, however, no such code of conduct for local authorities and the national government.

The Anti-Corruption Act establishes an Anti-Corruption Commission (ACC), provides requirements for investigations of corrupt practices and defines penalties. It makes corruption a legal offence and specifies different forms of corruption. It also determines what practices constitute an offence in relation to tenders.

37. A person commits an offence who, directly or indirectly –

(a) gives or offers to give to any person any gratification as an inducement or a reward for, or otherwise on account of, the withdrawal of, or the refraining from the making of, any tender for a contract invited by any public body, private organization, corporate body or other organisation or institution to perform any work, provide any service, supply any article, material or substance or for doing anything; or

(b) solicits or accepts or agrees to accept for himself or herself or any other person any gratification as an inducement or a reward for or otherwise on account of the withdrawal of, or the refraining from the making of, a tender for a contract referred to in paragraph (a).

The effectiveness of the ACC is controversial. It is assigned a very important role in the fight against corruption, but there have been instances where the ACC seemed not willing to expedite certain investigations. Moreover, it seems to be overburdened (Interview Mr Ruppel, Director/Chairman of the law firm LorentzAngula Inc., 28th February 2013) and becoming active on request rather than being proactive on its own. Nevertheless, it has conducted investigations in several tender cases [34]. Often the allegations have, however, found not to be true. In other cases such as the tender dispute about the construction of the new headquarters for the Ministry of Lands and Resettlement, there have been rumours that the ACC probes the tender [35], but it has never published a report about the investigation.

An éclat at the Ministry of Works, Transport and Communication, where a senior official allegedly violated tender procedures, led to comprehensive investigations internally and by the ACC [36]. Money was paid to a company for work that was never carried out. An internal committee mandate to investigate a self-enrichment scam in which
several senior people at the Ministry stood accused of pocketing hefty bribes, particularly in the tender process for Government capital projects had been appointed a few years earlier [37]. More than 30 dockets have been transferred to the prosecutor. In most of these cases poor quality work was delivered and the money saved was shared between the contractor, ministry officials and site inspectors. In other cases the work was not even done, nevertheless, the inspector certified it has been completed [38]. Investigations by the internal committee, the prosecutor and the ACC carried on for years and some individuals have been found guilty, some have been cleared. The slow path of investigations has been justified by the prosecutor in the case by a lack of human resources in her office. The 300-pages ACC report has been finalised in late 2007 [40] but up to date, no action has been taken based on the findings and it has not been published [41].

According to three interviewees (Interview Mr Haibach, Director of the Konrad Adenauer Foundation in Namibia, 21th February 2013 and Interviews with Mr Hopwood and Mr Ruppel), there are control committees but they do not or cannot efficiently carry out their function (e.g. underfinanced and/or lack of competent staff). These include the ACC, the Ombudsman, the Auditor-General (Article 127 of the Namibian Constitution provides for the appointment of an Auditor-General; its functions and duties are specified in the State Finance Act 2001), and the Standing Committee on Public Accounts. This Committee of the National Assembly of Namibia has been established in terms of the Standing Rules and Orders of the Parliament of Namibia (Section 47). In 2008, the IMF country report referred, *inter alia*, to weaknesses in the functioning of internal audit in the public service [42]. These are correlated issues that should be addressed within the framework of public procurement reform.

**REVIEW MECHANISM**

Procurement legislation does not refer to review procedures at all. There is, consequently, no procurement-specific external judicial or non-judicial review mechanism. There is further no internal review procedure and the only way to challenge tender decisions is by way to the courts or, to a very limited extent the involvement of the Ombudsman. Unsatisfied tenderers can request the Tender Board to clarify its decisions and to provide reasons. “If they are not happy with that, they can only go to court.” (Interview Mrs Jonga) The way to the courts is often avoided because of the costs or fear of consequences such as disadvantages in future tender procedures (Interview Mr Tötemeyer, 18th March 2013).

**Non-judicial review mechanisms: the role of the Ombudsman**

The Ombudsman’s mandate allows for handling of procurement matters. However, there are several hindrances that might explain why the ombudsman has been approached only very few times so far and is not suitable to handle procurement cases in general. Chapter 10 of the Constitution and the Ombudsman Act of 1990 provide for the establishment of an Ombudsman with wide-reaching functions. The Bill of Rights of the Namibian Constitution (art 25(2)) contemplates that aggrieved persons claiming that a fundamental right or freedom has been infringed or threatened may approach the Ombudsman to provide them with such legal assistance or advice as they require. Since complaints to the Office of the Ombudsman are free of charge, there are no limitations as to who can approach the ombudsman, no requirements of legal representation and no specific formal requirements [43], the Ombudsman might be an alternative option for tenderers. The Office of the Ombudsman has, *inter alia*, “the duty to investigate complaints concerning alleged or apparent instances of violations of fundamental rights and freedoms” (art 91(a) of the Namibian Constitution). This includes the right to administrative justice as contemplated in Article 18 of the Constitution. Since public procurement has been classified as administrative action by the courts (see *e.g.* AFS Group Namibia (Pty) Ltd v Chairperson of the Tender Board of Namibia and Others (A 55/2011) [2011] NAHC 184), there is the possibility to approach the ombudsman if a tenderer feels his or her right to administrative justice has been violated in a public procurement matter. The Ombudsman can, however, only make recommendations but no orders (Interview Mr Walters, Ombudsman of Namibia, 27th March 2013). And the current Ombudsman, Mr Walters, emphasized that, although he has the power to go to court to get an interdict to halt a tender, he did not have the resources to do so. Especially, in cases where a lot of money is involved this would be unsatisfactory and unsatisfied tenders would choose to go to court directly rather than to approach the Ombudsman. Furthermore, the process might take a long time, also because of the amount of work the Ombudsman has, and time is a crucial issue in tender disputes. Usually, tenderers would have enough money to approach a lawyer and only those few that do not have enough financial resources would approach the Ombudsman, explained Mr Walters. Nevertheless, there have been a few single procurement cases that have been handled by the Ombudsman. So far only the
2007 Annual Report indicates cases concerning corruption or non-transparency in tender procedures. The report contains one case summary relating to public procurement. The complainant, an unsuccessful tenderer, claimed irregularities in the tender process. An investigation by the Office of the Ombudsman unfolded that the complainant’s allegation did not prove true. The Ombudsman, additionally, mentioned another case where an unsuccessful tenderer approached him, and after looking into the matter the Ombudsman recommended that the Tender Board must cancel the award and recall for tenders. The Ombudsman stated that the Tender Board accepted and recalled for tenders. Both of the aforementioned cases concerned relatively small tenders. It can be concluded that the Ombudsman only in a very few procurement cases provides a useful external non-judicial review mechanism. With view to the peculiarities of procurement disputes, such as the importance of interdicts, the powers and functions of the Ombudsman are insufficient. Additionally, the extensive field of operation of the Ombudsman and its popularity lead to an overload of work for his office. This limited institutional capacity further constrains the Ombudsman’s potentials in this respect.

Judicial review by the Namibian superior courts

As mentioned above, public procurement disputes of different nature have been classified as administrative action and are, hence, reviewable under Article 18 of the Namibian Constitution. Article 18, the right to administrative justice, which provides for a right to judicial review, reads as follows:

Administrative bodies and administrative officials shall act fairly and reasonably and comply with the requirements imposed upon such bodies and officials by common law and any relevant legislation, and persons aggrieved by the exercise of such acts and decisions shall have the right to seek redress before a competent Court or Tribunal.

Judicial review in public procurement matters is usually based on Article 18 of the Constitution and common law. Article 18 does not substitute the common law rules but rather supplements them. This has been emphasized in case law (Frank & Another v Chairperson of the Immigration Selection Board, 1999 NR 257 (HC); 2001 NR 107 (SC), The Medical Association of Namibia Limited and Others v The Minister of Health and Social Services and Others (A199/09) [2010] NAHC 85). Article 18 has to be read in conjunction with Article 12, which establishes the right to a fair trial, and Article 5, which requires, inter alia, the Executive, Legislature and Judiciary and all organs of the Government and its agencies to respect and uphold the fundamental rights and freedoms and further declares them enforceable by the Courts. This imperative naturally includes the administrative justice provision of Article 18.

In application of Article 18, the superior courts of Namibia have not only recognised judicial review but also review of discretionary decisions [44]. This includes failure of applying a judgement of discretion, bad faith, consideration of irrelevant considerations and reasons and unreasonable evaluation of existing facts [45]. There have been several court cases in respect of public procurement issues. Some of those have made a great contribution to the development of public procurement law; others have disclosed the shortcomings of judicial review as sole review mechanism for public procurement cases.

In AFS Group Namibia (Pty) Ltd v Chairperson of the Tender Board of Namibia and Others (A 55/2011) [2011] NAHC 184 the High Court, for example, highlighted an important aspect of public procurement procedure, the provision of reasons for decisions, and held the following:

[115] The failure of the Tender Board to give reasons to the applicant based on what it terms to be a legal interpretation of section 16 of the Tender Board also in my view constitutes prima facie an unfair and administrative action and an infringement of the applicant’s rights under Article 18 of the Constitution. The giving of reasons is fundamental to fair and administrative decision-making.

In this case the Tender Board failed to give reasons to a tenderer who had not been shortlisted for consideration in the tender process. The unsuccessful tenderer has made a written request for reasons for the decision that it had not been shortlisted. The Tender Board had argued that the tender had not been submitted to the Tender Board for award and as a result the Tender Board would not be required to, nor could it provide the reasons as yet. (Section 16(1)(b) requires the Tender Board, on the written request of a tenderer, to give reasons for the acceptance or rejection of his or her tender.) Apart from this very important aspect, the court further found that the applicant had, prima facie, shown that the tender board abdicated its powers to the Ministerial Tender Committee and that the Ministerial Tender Committee acted ultra vires its functions. As mentioned above, the allocation of responsibilities in
regard to the evaluation of tenders has caused difficulties in practice. Another judgement regarding the requirement to give reasons is *Minister of Education and Others v Free Namibia Caterers (Pty) Ltd* (SA 37/2010) [2013] NASC 8. It was found that the court *a quo* had erred in finding that the failure to give reasons must lead to the setting aside of the decision. In fact, according to the Supreme Court the tender has to be set aside because it “was irregularly altered from being disqualified, on proper and valid grounds, to being qualified, for improper and invalid reasons” (para 39) or, in other words, the non-acceptable tender has been changed in order to qualify. Certain documents proved that the members of the evaluation committee “had rectified unacceptable promptings from higher authorities who wanted the committee to reverse its earlier adverse recommendation against the third appellant” (para 20). This is, therefore, another case disclosing the likelihood of corruption in the current organisational and institutional setting. Regarding the right to give reasons, the Courts have stressed the importance thereof in public procurement. Nevertheless, it has also been clarified that the failure to give reasons is not necessarily a justification to set aside a tender. This is essential in respect to the objectives of public procurement, since the failure to give reasons has no direct effect on the award decision. If the decision to award the tender has otherwise been according to the law, setting aside the award decision would unnecessarily delay the tender process.

An important case, that has been decided recently, indeed disclosed many of the shortcomings of the Namibian tender law, but the Court made essential and very important remarks on several of these issues. In *Neckartal Dam Joint Venture v The Tender Board of Namibia & Others* (A 109/2013 and A 76/2013) [2013] NAHCMD 186 the award decision of the Tender Board was set aside and the matter was referred back to the Tender Board. In regard to the contention of the applicant, that the weightings attached to the components (technical, financial, risk and social) in the evaluation of tenders were inconsistent with the principles of fairness, reasonableness, competitiveness, and cost-effectiveness because allegedly too much weight was attached to the technical component and too little weight to price (para 59), the Court held

[69] Whilst price should in our view always remain an important consideration in a competitive tender process, we do not consider ourselves to be in a position to assess the precise weighting it and the other factors should have received and thus not in a position to find that the weighting of the factors decided upon by the evaluation committee was unfair or unreasonable in the circumstances.

Regarding the supposed failure of the decision-maker, the Tender Board, to apply its mind, the Court acknowledged that, especially in highly technical matters the Tender Board may seek “expert assistance in evaluating, assessing and comparing competing bids as long as it retains its decision making capacity and exercise it” (para 70). The Court, indeed, brought some clarification what is required in order of a Tender Board’s decision resting on a recommendation and evaluation of another body to have applied its mind independently and exercise its discretion fairly and impartially. The Court held,

[73] But where the board seeks and relies upon a summary of the advice of a technical nature, that summary of a technical assessment provided to it must accurately and fairly reflect the views of those who gave it.

In other words, this means that the evaluation process must be fully transparent and entirely comprehensible for the Tender Board so as to be able to make a decision. The Court also found that the identification of four of seventeen designated core positions of personnel for the purpose of evaluation was not fair and reasonable (para 96). Applying the principles of fairness and reasonableness to the manner of evaluation is a great step forward, since it limits the discretion of the Tender Board to conduct evaluation in a manner to favour a certain tenderer and further to deviate from the designated evaluation components. The selection was done because of time constraints which should indeed, in no circumstances, be accepted as justification for not considering requested information in the evaluation of tenders.

Whereas the latter cases have shown that the Courts have an important function in interpreting and advancing the law, there are also cases that show that judicial review and the available remedies are not suitable for all public procurement cases. If an unsuccessful tenderer wants to challenge a decision, the challenge is only relevant when decided upon before the implementation of the contract. The relevance of a court case, hence, often depends on the decision to be heard as a matter of urgency. In *Aurecon Namibia (Pty) Ltd v The Roads Authority* (A 250/2012) [2013] NAHCMD 21 an application for urgency was denied. The court reasoned that “in the circumstances of this case the commercial interest of the applicant in this matter is not of such a nature as to render the matter urgent”. The court stressed that “other litigants waiting for their matters to be heard would be prejudiced if priority were
afforded to this application as they would have to wait longer” (para 13). Matters where a person’s safety or liberty is involved might, for example, be more likely to be granted urgency. In Court, public procurement cases are competing with other important cases that might have a higher priority. However, this is an unsatisfying justification for unsuccessful tenderers seeking judicial review. Another case where urgency was denied is Namibia Construction Industries and Murray and Roberts v the Chairman of the Tender Board and the Ministry of Works A 283/200. Unfortunately, there is no written judgement available, since only a court order was made. Namibia Construction Industries and Murray & Roberts were unsuccessful tenderers for the construction of the new headquarters of the Ministry of Lands and Resettlement although they did not produce a valid certificate of compliance from the office of the Employment Equity Commissioner as required by the Tender Board regulations. The application for urgency by Namibia Construction and Murrays & Roberts was denied and the Chinese company who won the tender commenced on the project. The case is still pending while the construction of the Ministry of Headquarters has long been finished. A representative of Murray & Roberts stated the legal costs paid by it and Namibia Construction as high as about 1 million N$ (Interview Mr Agenbag). A well-known advocate has the view that the urgency judgement was not reasonable (Interview Mr Töttemeyer). It was also described as irresponsible decision with the primary objection that the construction process could proceed unhindered [46]. This raises the question whether the quality has a link to impartiality on the judge’s side or on the competence of the judge in public procurement matters. Both scenarios could have a detrimental effect on future procurement cases.

The latter cases disclose the insufficiency of dispute resolution mechanisms regarding public procurement in Namibia and, especially, that there is no effective internal or non-judicial external review mechanism that responds to the specific nature of public procurement. Judicial review might be an effective mechanism but implicates problems as costs, duration and access [47]. The interviewed lawyers in Namibia, further, stated that they have the experience that their clients often give up or shy away from taking court action because they are afraid that it could have an adverse effect on future procurement decisions. “Business prospects are way more important than a single (court) case.” (Interviews Mr Ruppel, Mr Töttemeyer) Especially in Namibia with a small economy this would be of particular relevance. This view was confirmed by the Ombudsman of Namibia, who stated that the way to the courts is often avoided because of the costs or fear of consequences such as disadvantages in future tender procedures.

Public procurement cases differ from other cases, inter alia, because of the public interest at stake. The urgent clarification is not only relevant for the applicant but for the fairness of the tender procedure and, hence, for its efficiency and effectiveness. If no interdict has been granted, the application might even be rendered irrelevant if the contract is awarded or implemented in the time passing until the judgement. In case there is an interdict and the procedure is halted, the delay has a negative effect for the whole process because the goods, services or works have to be waited for. It shows that specific procurement related review procedures are important in order to do justice likewise to tenderers and to the public interest.

In Namibia, the courts have rendered some important judgements in respect to public procurement. However, there is an urgent need for administrative review and the creation of an independent review panel. An independent review panel might be of great advantage because it could be preferable in respect of costs, access and duration to judicial review. It can hold specific public procurement law expertise and provide for remedies and procedures specifically suitable for public procurement disputes. Furthermore, administrative review can be by way of a direct complaint to the procuring entity or to another administrative authority. This allows the procuring entity to comment on the allegations, to ease doubts about the fairness and rightfulness of their decision, or to reconsider their decision and make adjustments. Thereby litigation and corresponding time and costs can be avoided [48].

CONCLUSION

The analysis of the Namibian Tender Law and Regulations discloses that there are several shortcomings that hinder the efficient and effective functioning of the public procurement system. Nevertheless, the field research also made obvious that the implementation of laws regarding public procurement is deficient, too. Many of the interviewees stated that they consider the implementation of law as a problem, rather than the law itself (Interviews with Mr Töttemeyer, Mr Schulz, and Mr Hopwood). There would be a lack of political will and a lack of implementation would be a general problem in Namibia. It seems that there is no consequent implementation but exemptions are granted for certain groups or people. However, it has to be emphasized that the law indeed is insufficient and leaves room for corruption, non-transparent decisions, concealment of facts, etc.
First of all, the institutional and organisational framework has proved to be dysfunctional. The Tender Board and its staff are heavily overburdened and there is a lack of skills and qualification. The political appointments of the Tender Board members lead to an exclusive round of politicians with a disproportionate amount of influence. The practice as well as case law has revealed that the regulation that the Tender Board takes the award decisions but can obtain recommendations by the line ministries renders problematic. Evaluation is basically made by the line ministries and referred back to the Tender Board as recommendation, hence, the Tender Board always moves on a thin line between acting ultra vires and meeting its responsibilities under the Act. The possible exertion of political influence to follow the recommendation cannot be neglected in this matter. The shortcomings in the institutional and organisational framework should not be underestimated as they severely hinder qualitative and timely decision-making.

Another problem concerns the scope of the Namibian public procurement law. Exemptions granted from the application of the Act pose a major problem as more than half of public procurement is exempted from the application of the tender law. It is neither clear what criteria need to be fulfilled in respect of exemptions nor is it clear what methods are applied alternatively in the cases of exemptions. It is of utmost importance to enact strict regulations on what method can be applied in what circumstances and to restrict reasons for exemptions rigorously.

The lack of regulating contract management has led to a situation where the Tender Board simply abdicates from any responsibilities in regard to law abuses after the contract has been awarded. The line ministries, responsible for contract management after the tender has been awarded, and the respective commissioners, responsible to enforce labour, social and affirmative action laws, do not sufficiently interact with the Tender Board. This is inadequate and ineffective; law abuses and insufficient contract implementation have occurred quite frequently but have mostly remained without effect on future procurements. This has undermined the efficiency and effectiveness of the whole public procurement system.

The transparency regulations are outlined fragmentarily which makes it easy to veil corrupt activities. Additionally, there has not been an effective mechanism to investigate and scrutinize corruptive behaviour. The combination of potential rewards in public procurement where high amounts of money are spent and a lot of different interests are involved with a low risk of detection makes it likely that the system is misused for personal benefits [49]. Transparency regulations are not only insufficiently regulated but also insufficiently implemented as the Tender Board often acts in secrecy and refuses the disclosure of information, if they are not obliged to do so by court. Additionally, there have been cases where the Tender Board did not adhere to the applicable tender legislation, revealing that there are shortcomings in public procurement law implementation and in the wider sense in the application of the rule of law and good governance.

The review of public procurement proceedings is limited to judicial review and external non-judicial review by the Ombudsman, which has, however, not proven to be adequate for most procurement cases. There is neither administrative review nor non-judicial external review available that is suitable for public procurement. Judicial review has proven not adequate as single review mechanism, although courts have made some important remarks strengthening the existing public procurement framework. Apart from the factual problem that there often is an unwillingness to take court action because it is feared that it impinges upon business prospects and because of the financial costs involved, the remedies and procedures of judicial review are not suitable to deal with all sort of public procurement disputes in an adequate, timely, efficient and effective manner.

The inefficiency and ineffectiveness of public procurement in Namibia severely hinders socio-economic development which depends, inter alia, on qualitative service-delivery and infrastructure development which in turn also forms part of the factors necessary for economic growth. In consideration of the amount of public money being spent in the field of public procurement (approximately 15% of the world’s GDP, 10% of most industrialised countries’ GDP, and numbers up to 70% of the GDP for developing countries’ public procurement [51]), and money wasted through corruption and the inefficiency of a system, an efficient and effective procurement system is essential in order to spend the money wisely.
3. REFORM PROCEEDINGS

STEPS/STAGES OF REFORM PROCESS

The Practical Guide to Transforming Procurement Systems by the Special Steering Committee of the OECD-DAC Task Force on Procurement [52] emphasizes that reforms of public procurement systems should follow certain steps and stages. This includes an assessment of the current procurement system, planning the reform course and the resource allocation, assigning responsibilities and setting time frames and deadlines. It is further important to formulate objectives that want to be pursued by public procurement in general and by the reform of the system.

A first step should be the assessment of the current procurement system [53]. Several instruments are available to carry out an evaluation of the status quo. A good example is MAPS, the Methodology for Assessing Procurement Systems by the OECD [54]. It has been drafted to “enable a country to conduct a self-assessment of its procurement system to determine strengths and weaknesses, or to help development agencies carry out joint or external assessment of a country’s procurement system”[55]. MAPS is offering several indicators and sub-indicators to analyse the existing legal framework that regulates procurement in the country; the institutional architecture of the system; the operation of the system and competitiveness of the national market; and the integrity of the procurement system [56]. The deployment of sufficient human and financial resources to assess and evaluate the procurement system and its environment at the beginning of reform will certainly pay off in the reform outcome. It is to emphasize that to identify and then address the root causes of problems in public procurement systems is certainly more promising than addressing just the symptoms of malfunctioning [57]. (Relevant) Stakeholders should hereby be involved through interviews, workshops or surveys [58]. Stakeholders include the government, public procurement staff, the procuring entity or entities, the business sector as potential or actual supplier, public interest groups and the wider public [59].

Since a reform of public procurement law requires knowledge of public procurement law in general as well as of the country-specific context, it is necessary to find adequate personnel to lead the reform. It might be expedient to consult external experts which have comprehensive knowledge of public procurement reform; however, there should always be a close collaboration with domestic experts in order to guarantee ownership of reform proposals and results as well as to ensure that the reform is embedded in the local context.

The roles and responsibilities should be clearly assigned at the beginning of the reform in order to avoid misunderstandings and delays because of incompetence [60]. The experts need to have sufficient knowledge and experience of the matter as well as enough resources to do the job; the latter includes time and means to carry out their function. It is, further, important to identify realistic timelines [61] so as to prevent reform delays but also discontentment and a loss of trust in the achievements of the reform.

THE EXAMPLE OF NAMIBIA

Outline of the Reform Process

As mentioned above, the reform of the Tender law in Namibia has started more than ten years ago and the bill is hopefully passed in this years’ parliamentary session. Such promises were, however, made already in 2012 and in 2013 but were neglected [62]. According to members of the Tender Board, the bill is currently with the legal drafter. The current draft has been preceded by several other proposals. The first draft did not substantially differ from the current act but, meanwhile, it has been realized that the procurement system needs a comprehensive change and the whole structure and procedures of the procurement system have been altered in the latest draft.

In charge of the reform is the Ministry of Finance in collaboration with the Tender Board itself. According to one of the interviewees there has also been communication with the Office of the Prime Minister about the reform (Interview Mr Isaacs). The Law Reform and Development Commission (LRDC) of the Ministry of Justice has not been involved, as Mr Hopwood stated. The LRDC has been established by Section 2 of the Law Reform and Development Commission Act, 29 of 1991, as amended by the Law Reform and Development Commission Amendment Act No. 2 of 2004. It is, however, not clear what reform projects are carried out by the relevant ministries themselves and what is done by the Ministry of Justice/LRDC. It might have been of great advantage for the reform process if it was carried out by experts that are not part of the public procurement system itself. The drafting has been done by the Ministry of Finance and the Tender Board and at a later stage a Mauritian
procurement expert has been involved. Only two of the Tender Board members are lawyers without any qualifications in public procurement law, though.

The reform process has been accelerated in 2010 when the Commonwealth got involved (Interview Mr Sipiho, Tender Board, 26th March 2013). Prior to this external assistance, the Tender Board members and the Ministry of Finance were solely responsible for the reform project. The Commonwealth Public Procurement Network (CPPN) assisted the reform process with technical expertise, holding workshops and conferences about Public Procurement in Southern Africa, explained Mr Sipiho. The CPPN is an organisation of the Commonwealth bringing Public Procurement Practitioners together [63]. The aims of the Network are the promotion, strengthening and facilitation of information and exchanges of solutions oriented to develop, spread and implement best practices in public procurement [64]. It has held annual Procurement Conferences in Africa since 2006. In 2010 the Fifth CPPN Technical Conference was hosted by Namibia, particularly the Ministry of Finance and the Tender Board of Namibia [65]. At the conference, the Deputy Minister of Finance at that time stressed the need for a review of Namibian’s public procurement legislation. He stressed that a successful procurement process has to be transparent and predictable, cost effective, accountable and there need to be consequences for wrong-doing. Sustainable procurement outcomes could be ensured by procurement mainstreaming, capacity development, benchmarking, monitoring and evaluation. Mrs Shafudah, Chairperson of the Tender Board, presented an overview of the legislative review. Further presentations about the Namibian public procurement system were made by a CEO of the Namibia Chamber of Commerce and Industry (Namibia’s Current Public Procurement Practices: The Private Sector’s Perspective), by the Director of the Construction Federation Industry (Challenges in the Namibian Construction Industry) and by the Director of Capital Project Management of the Ministry of Works and Transport of the Republic of Namibia (Stakeholder’s engagement – Merits of a progressional approach). Problems and weaknesses of the Namibian public procurement system were at the most adumbrated. It was, for example, stated twice that there are exemptions for price preferential considerations [66] and that there are “some exceptions from normal tender procedure”[67]. However, that quite a big share of tenders are exempted from the normal procedure and that this process is rather non-transparent and applied randomly and, hence, constitutes a major problem in the Namibian public procurement system has not been admitted. It seems that the chance to receive recommendations from procurement experts at the conference about how to deal with the shortcomings of the Namibian public procurement system was blown by not wanting to admit the basic but severe shortcomings. Nevertheless, Mr Sipiho explained that, after this conference, it was realised that something urgently needed to be done in regard to the Namibian procurement system. Thereupon, an expert from Mauritius was invited to Namibia to provide his technical expertise in drafting a new bill. In 2012 a group of procurement experts from the Commonwealth Secretariat came to Namibia to assess its public procurement system [68], but the report is apparently not available to the public. The interviewed Tender Board members did not know about the existence of such report and the IPPR had not even heard that such an assessment took place. Further actors joined the stage to assist and facilitate the Namibian reform process. According to the Commonwealth Secretariat, this has been catalysed by the report of the Commonwealth [69]. The EU’s support included a €250,000 diagnostic review of public procurement. Additionally, in early 2013 the European Union has sent three procurement experts, one legal and one IT expert as well as an accountant (Interview Mr Sipiho). According to Mr Sipiho, the World Bank also expressed its interest to assist the reform project. He also said that from mid-2013 the government would employ three procurement experts (one IT expert, public procurement expert and one legal expert) for a three-year project on the reform and the implementation of the public procurement system.

The Instrument of Comparative Law and Model Laws

The instrument of comparative law has played a major role in the reform process. Especially, the legal systems of Tanzania, Botswana and Mauritius were considered as models for the new bill (Interview Mr Isaacs). Those laws were identified as most progressive public procurement laws within Africa. The influence of the Mauritian law might also be contributed to the fact that one of the experts assisting the reform project is from Mauritius. In 2010 a Namibian delegation went to Mauritius to take a closer look at its public procurement system (Interview Mr Sipiho). Mauritius has introduced its Public Procurement Act in 2006 within the context of reform efforts by COMESA [70]. The law considers best practice recommendations of the UNCITRAL model law and the COMESA Public Procurement Regulations.

The UNCITRAL model law and the COMESA Public Procurement Regulations have, though, not been examined
at all. Since the UNCITRAL Model Law provides general rules and procedure that can be aligned to each country’s situation, it would make sense to look at the model law rather than on a domestic procurement system which is to be seen within the setting of the particular country. It is distressing that most of the interviewed board members have not even heard from the UNCITRAL Model Law. The same applies to the Government Procurement Agreement of the WTO. It has also not been considered to initiate or consider potential future regional procurement rules in the SADC or SACU region. Botswana, for example, has designed their procurement regulation flexible enough to integrate external trade obligation into its public procurement system, if necessary [71]. And as Amoo [72] notes, the recent free trade agreement between SACU, SADC, COMESA and EAC may bring the liberation of procurement markets to the fore in the near future. The lack of knowledge about the international discussion on public procurement law and reform not only hypothesizes that the Tender Board members have not conducted research, but also that the reform process including the conferences and workshops have not considered the whole extent of possibilities to tackle the reform. It can be further assumed that the choice of legal systems that should serve as role models has been either taken arbitrarily or have been promoted by external actors. This does not comply with the standards of comparative law where the choice of legal systems used for comparison should follow certain principles and be carefully selected.

Despite the common history of apartheid and certain legal similarities, the South African public procurement system has not been considered as role model. After independence Namibia has been geared to the South African legal system, simply because Namibia has not had enough capacity to originate own progress [73]. Article 140(1) of the Namibian Constitution states that „[s]ubject to the provisions of this Constitution, all laws which were in force immediately before the date of Independence shall remain in force until repealed or amended by Act of Parliament or until they are declared unconstitutional by a competent Court.“ Hence, many laws have been inherited from the pre-independence area and some new laws such as the Competition Act No. 2 of 2003 are similar to South African Law [74]. This makes it even more astonishing that the South African system has not even been looked at. In particular in view to affirmative action’s strategies within the public procurement system it might have been worth to look at their approach, since they face similar problems resulting from decades of discrimination under the apartheid system. It was reasoned that South Africa has its own challenges and is not really a benchmark in public procurement (Interview Mr Titus). Additionally, Namibia would want to move away from the South African system. However, the fact that the South African system has not even been researched into can, based on the above mentioned similarities of the legal systems and the social context, be constituted as deficient.

It also has to be emphasized that the coherence of legal rules plays a significant role when using foreign laws as basis for reform. It is insufficient to simply copy provisions used in other countries without adapting them to the domestic context. The non-critical examination of foreign legal systems in the field of public procurement, especially, the neglect of looking at South Africa’s approach to preferential procurement in this case, suggest that it has not been seriously attempted to adapt regulations that are suited for and can be fitted into the Namibian setting. Nevertheless, this might not necessarily be due to ignorance or unwillingness but might be accounted to the fact that there is a lack of qualified legal procurement experts.

**Stakeholders’ involvement**

During the whole reform there has not been a formal consultation process of relevant stakeholders. In respect to reform processes in other fields of law, there are workshops held or letters sent out with the call for comment. In this case, certain individuals were approached for comment but formal consultation did not take place. Mr Schulz from Namibia Construction stated that the government once or twice asked the company what it would like to be changed in tender law. He further stressed that this consultation has been more than a year ago (early 2012), they did not hear anything from the government again and so far nothing has changed. According to a Tender Board member, stakeholders such as companies, SOEs and parastatals were invited to meetings to give their input (Interview Mr Isaacs). The first draft would have been sent to the parastatals to obtain their input. Mrs Jonga, however, admitted that consultation did not happen to the extent as it should have been done. Several stakeholders have been approached but there has not been a full engagement of stakeholders. Only a few that were proactive were involved in the discussion to a limited extent.

The Institute of Public Policy Research has done intensive research about the Namibian procurement system. It has analysed the strengths and weaknesses of the system and pointed out to critical elements that have to be attended to.
The IPPR was given two different drafts of the Ministry of Finance. The first one from June 2010 did not differ much from the current Act. The latest draft which was given to the IPPR, though not as an electronic version and with some missing pages, has intensively changed, resembles the Mauritian procurement law and might be close to the actual version of the draft. The Ministry of Finance thanked the IPPR for its comments given on the draft and said it would consider them. The role of the IPPR has to be highlighted since it is the only Namibian institution that has carried out (qualified) academic research about public procurement law. Although its limited influence on the project which can be attributed to the governments unwillingness to involve external experts and stakeholders, it might have inspired the Ministry of Finance to press ahead with the reform. The Namibian delegation to Mauritius, for example, only went after a paper of the IPPR has referred to the Mauritian public procurement law. The Tender Bulletin, a weekly newsletter that has been published since 1990, was also given a draft, but it is not clear whether this is the same draft the IPPR received. It can be concluded that consultation of stakeholders has only taken place to a very limited extent and in a non-transparent way.

Obstacles

What has been emphasized as reform hindrance is that the tender board has had changing bosses three times since the start of the reform (Interview Ms Jonga). Moreover, interviewees assumed that there has been a lack of communication and collaboration between responsible people in the Ministry of Finance and the Tender Board and also within the Tender Board itself which would be split into two camps (Interview with Mr Links, Insight Magazine, 21th February 2013).

The fact that the involvement of the CPPN accelerated the reform process might be an indication that there is a lack of expertise and experience to review and address the public procurement system within Namibia. There has further been no proper strategy to carry out the reform. It would have been necessary to first analyse in detail what are the major shortcomings of the current system. Instruments such as the OECD/DAC Methodology for Assessing Procurement Systems (MAPS) could have been used to assess the quality and effectiveness of the presently applicable Namibian public procurement system. Namibia has not set out the responsibilities, deadlines and objectives of reform. When the Tender Board Secretary Welma Enssle was asked in 2011 whether there is a timeline for reform, she responded that “We would like to see it this year still, and I think the minister would like to see it this year.”[76] Additionally, the complexity of the matter has not been adequately embraced. So would it be, for example, recommendable to review non-procurement specific public service functions such as internal audits in regard to their impact on public procurement and their efficiency since they can make an important contribution to the transparency of the public procurement system, if relevant.

Furthermore, a comprehensive research of international best practices and foreign systems with a similar legal system and similar problems, such as South Africa, would have been indispensable to find qualitative and suitable solutions for Namibia. According to one of the interviewees, the unwillingness to make an analysis of errors in the own house is a common problem in Namibia, instead of working on the roots of a problem and improving existing legislation a complete new bill is passed. Reasons for this would be the lack of expertise, not enough people who could identify the shortcomings, unwillingness to admit wrongdoing, lack of political will and political interference in administrative decision-making (Interview Mr Schulz).

As suggested by the circumstances, in particular the length and the non-transparency of the reform process, and confirmed by several interviewees there is clearly a lack of political will to finalise and pass the bill. Statements from the highest governmental level such as from the President Pohamba who said, in early 2011, that he would have instructed the Ministry of Finance to finalise the reform of the public procurement bill as soon as possible [77] seems to be lip-service rather than true intentions. It can be assumed that vested interests of government officials are the major reason for continuing resistance of decision-makers. The fact that the main focus of the reform lies on Namibianisation rather than transparency might be a hint that government and in particular the Ministry of Finance and the Tender Board do not realize or do not want to admit that non-transparency is hindering the efficiency and effectiveness of the procurement system. Corruption in tender procedures is not seen as a major issue. Hence, there is ignorance in respect to this matter and, hence, a lack of political will to address it.

Especially, the permanent secretaries who have a lot of power in regard to public procurement decisions in the current system would run against changes simply because it would mean a loss of influence and power (Interview Mr Hopwood). The relationship of government officials with Chinese companies might also play a role. As loans or other assistance coming from China often come with attached conditions such as the award of projects to Chinese
companies, a more transparent public procurement system might hamper such obscure deals which are probably used by procurement officials for their own personal benefits as well. Favouritism in respect to relatives, friends or even ethnic groups as well as corruption possible in the current system might be way more difficult after a successful reform. And especially in this situation, where the Tender Board itself is in charge of the reform, the reformers are identical or closely related with the group of people that have a severe personal interest in maintaining the status quo. The situation in Namibia practically reflects the scenarios described by Hunja. He refers to scenarios, where, despite public commitments to reforms by governments, endless and circular discussions are used as a means of forestalling progress or finalisation [78].

A lack of financial resources to carry out reform and restructuring the public procurement system is, according to Mr Hopwood, not an issue. There are enough resources in government; they just would need to be used.

Recent developments

In September 2013 the new Public Procurement Bill was tabled in the National Assembly [79]. After heavy criticism of the bill, it was finally withdrawn from Parliament until further notice in mid-October and the bill will be only re-tabled in 2014 [80]. It was, inter alia, criticised that the bill makes the Minister of Finance too powerful as he appoints the executive director of the procurement Policy Office [81]. Criticism was also expressed in regard to the way the bill was drafted. It was further alleged that the role of the government and that of new institutions, to be created under the proposed law, would not be clear, and that the bill might disadvantage businesses run by black Namibians [82]. Moreover, stakeholders would not have been appropriately enabled to provide their inputs in the reform process [83]. The SWAPO Party Chief Peter Katjavivi expressed his discontent about the organisational structure suggested by the bill by saying that “[t]he multiplicity of entities within the Bill creates a worry over bureaucratic delays. If you have the Procurement Policy Office, the Central Procurement Board, the Procurement Committee, the Procurement Management Units and Bid Evaluation Committee, probably we do not need the bid evaluation committees, because procurement committees can as well evaluate bids.” [84]

It can be concluded that although the reform process finally delivered a bill, the proposed law has been dismissed because the reform process was so flawed, non-transparent and exclusive. There is no ownership of the proposed bill, the majority of parliament members, which are probably representative for the wider public, cannot relate to the new bill and is also not aware of the idea and the reasons behind the new organisational structure and the new public procurement system. This might be partly due to the fact that the underlying problems of the current tender board system were never really understood, but only the negative effects caught outrage. Stakeholders were never engaged properly. Information about the reform progress and the involvement of foreign experts were never published. Although several government officials repeatedly stressed the importance and the priority of the reform, this was not reflected in the handling of the reform. When conducting a public procurement reform it cannot be the only aim to deliver a good piece of legislation, it needs to be ensured that such legislation has ownership in the government, in the private sector and in the wider public. This has been totally disregarded in Namibia and will probably, even if a new bill is passed, have a negative effect on the implementation thereof.

CONCLUSION

The Namibian reform process has been running for more than ten years without success. A lack of political will could be identified as major hindrance, but there are other problems impeding reform progress as well. These include a lack of capacity and expertise, the fact that the same who are responsible for running daily public procurement proceedings are responsible for the reform (which not only leads to conflicts of interest but also to time constraints), a lack of a coherent reform strategy, and changing ministers in the responsible Ministry. Namibia has furthermore failed to conduct a substantive assessment of the current public procurement system in order to identify strengths and weaknesses.

With respect to the substantial part of a new public procurement framework, Mauritius has been selected as role model. No substantive research on public procurement has been conducted and none of the interviewed tender board members had even heard about the UNCITRAL Model Law on Public Procurement. Mauritius has been basically chosen for the reasons that its public procurement system is quite modern and progressive and that a Commonwealth expert from Mauritius assisted the Tender Board with the reform. There has been a general unwill-
ingness to look at the South African approach which might have proven beneficial in regard to certain elements. It seems that the reform team has not selected the Mauritian law as a basis because of factual considerations and of the similarity of factors of influence – since these have not been analysed in detail - but the reputation of the Mauritian law and the refusal to consider the South African legal system. This seems to be a very subjective approach, not necessarily being appropriate.

Whereas external assistance has in many countries led to the enactment of new public procurement legislation, Namibia has, despite the involvement of several external experts, not produced results. Unfortunately, it is unclear what institutions have been involved to what degree. The World Bank, the European Union and the Commonwealth Public Procurement Network all apparently played a role in the Namibian reform process but there has been no transparency about this involvement. Additionally, communication between the Tender Board and the responsible persons in the Ministry of Finance has been insufficient which makes the reform process even more obscure.

With exception of the Institute for the Public Policy research and the Tender Bulletin, there is no academic debate about public procurement and no expertise challenging the current procurement practices. However, there is huge public discontent about the way public procurement is carried out and the media deals with this issue frequently. Unfortunately, this seems not sufficient to stimulate political will to finalise the reform. Public procurement stakeholders have not been involved in the reform process properly and adequately. It has further not been possible for any stakeholder to track reform proceedings as the whole process has been non-transparent. This has led to a lack of understanding and ownership of the proposed law which had consequently to be withdrawn from the National Assembly because of severe criticism.

4. LESSONS LEARNED

A public procurement reform should envisage and make provisions for the appointment, employment and training of qualified personnel that is able to fulfil the required functions and to act on their responsibilities. Otherwise no qualified decisions can be made and there might even be a hesitation to take decisions at all because the employees are scared to take wrong decisions and in consequence lose their job. It is furthermore an essential issue to pay the personnel adequately in order to reduce the motivation to become corrupt. Institutions, offices and departments not only need to be staffed with qualified but also with a sufficient number of personnel.

It has not only become obvious during field research in Namibia that the powers and responsibilities need to be clearly assigned but also that there is a separation of powers and responsibilities in order to prevent corruptive practices. The evaluators should be independent from people directly involved in the procurement matter (e.g. special units within the ministries) and there need to be an external monitoring of procurement decisions in order to avoid any kind of exertion of influence on the decisions that is motivated by other reasons than the pure pursuing of procurement objectives.

It has also become apparent that the decentralisation of public procurement and an institutional restructuring, as it has been conducted in many public procurement systems in the recent years, is also urgently needed in Namibia. Although it is clear that there need to be an effective overview institution with qualified and independent staff, public procurement decisions might be taken more efficiently and effectively by a special unit in the procuring entities which possess the relevant knowledge and experience of public procurement in general but also of the procurement matter.

The assessment of the Namibian procurement system has disclosed that new legislation necessarily has to include the regulation of contract management. This is a key instrument to ensure successful contract implementation and the adherence to the laws of a country. It is not only important for the reliance on the rule of law by potential tenderers, investors, companies and other stakeholders but in a wider sense for socio-economic development.

The analysis of the scope of the Namibian law which allows for general exemptions that are not really bound to any specific criteria and have severely undermined the transparency and the effectiveness of the public procurement system, reveals that the scope needs to be as extensive as possible. The provision for alternative procurement methods for all possible scenarios is preferable to exemptions which allow public procurement to take place in a legal limbo in a non-transparent way.
A public procurement law needs to be designed in a way that does not leave room for non-transparent and corruptive practices and any other kind of misuse. Therefore, transparency in all procurement stages is essential. Moreover, effective oversight mechanisms need to be created. A general oversight mechanism might be overburdened with procurement cases, so it might be a better solution to establish a specific procurement oversight body. This, however, needs to be decided according to the particular local context. Additionally, it is strictly advisable to establish an independent review panel and the possibility for administrative review as judicial review alone is not suitable for the specific nature of public procurement cases. Nevertheless, courts have an important function to develop and interpret the law through their judgements.

As the Namibian case study discloses, implementation is indeed of utmost importance but if the law has too many loopholes only a new law can foster a radical improvement of the situation. Insufficient public procurement legislation as in Namibia has a severe negative effect on socio-economic development. A reform is, hence, urgently needed. However, the operation of the reform process with the aim to adopt a new law is of particular relevance for the success of new legislation and its implementation. Simply replacing the insufficient bill with a modern and up-to-date piece of legislation is not enough for a successful reform outcome. It is necessary to assign responsibilities and to commission qualified, experienced and unbiased experts with the reform. Nevertheless, it has to be ensured that an adequate share of those experts knows the local context. Additionally, the allocation of adequate resources and capacity is a key condition to carry out a public procurement reform successfully.

Namibia has had external assistance in the past years of the reform process. It has shown that external involvement can accelerate and support domestic reform efforts; however, it should be ensured that local people are equally involved in the reform project. Otherwise there will be a lack of domestic context of the new legislation and a lack of ownership, too. The involvement of foreign actors should be treated as transparent as possible to counteract a rejection of the new law as a product being imposed by foreign actors.

In order for a public procurement system that does not reveal the same problems as the previous system, an assessment of the old system has to be carried out. Strengths and weaknesses need to be identified. The Namibian example further reveals that it is essential to do comprehensive and substantive search on public procurement. It should be looked at other legal systems and especially international best practices. But indeed it is important not to be led by subjective motivations in the choice of other legal systems as models.

A key result of the analysis of the Namibian reform process is that transparency and the inclusion of stakeholders already at an early stage of the reform are of utmost importance to create ownership of the new law; this is the first step towards successful implementation of new public procurement legislation. For a successful reform process, consultation of stakeholders should be comprehensive, start at an early point of the reform process and should be transparent. If there is a lack of political will, it can only be countervailed if everyone is convinced of the advantages of the reform, understands the need for reform, and no one is left behind. Hence, transparency and inclusion are of utmost importance.

REFERENCES


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TITLE: Half-time, innovation in Rotterdam and Amsterdam procurement

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1. ABSTRACT:

Half-time is the professional innovative cooperation between contractors and procurement authorities in major construction projects, aimed at the prevention and deduction of inconvenience and hindrances in the vicinity and environs of the tendered construction site.

With time as a crucial and decisive tool in tenders, the cities of Rotterdam and Amsterdam have improved the preparation and realization of major public constructions in an urban environment. Thus using time as a tool in tenders both cities have learned to accomplish a significant deduction of project and construction time (half-time), optimization of costs, an apparent stimulation of innovative techniques, and a strongly improved cooperation between the involved tenderers and the procurement authorities.

Important side effects are innovation, the decrease of judicial conflicts and litigation, and the improvement of competition conditions.

2. INDEX

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4. Economical crisis, constructors fraud and current competition in the Netherlands
5. First step: renewed cooperation and mutual confidence
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3. Procurement by Amsterdam/Waternet

Amsterdam/Waternet specializes in watergovernment. Waternet is the first public authority in the Netherlands that combines all possible water services under one roof. Waternet is responsible for the production of high quality drinking water, the cleaning of waste water, the protection of surface water and the guaranteeing of public safety behind regional and national embankments. Waternet works mainly in and around the Amsterdam area. Amsterdam/Waternet has a considerable interest in a competing building market, as it grants yearly tenths of millions of euros on construction and engineering in these specific fields of operations. A special branch of this organization is World Waternet. World Waternet helps to achieve the millennium-goals as set by the United Nations, specifically the set out millennium-goal of sanitation. World Waternet deals with all aspects of the water cycle in projects in development countries, including clean drinking water, safe soil water levels, reliable sewerage, waste water purification and the realization of practical water-treatment plants. By providing an integral, sustainable approach it faces the growing water crisis in the world. The solution presented is a long-term teamwork with local water operators, municipalities, universities, engineering agencies, technology suppliers and financiers. This year World Waternet accomplishes projects in Egypt, South Africa, Morocco, Indonesia, Turkey, Suriname, and the Dutch Antilles.

Amsterdam/Waternet characterizes therefore as a specific technological company, with a keen eye on new developments of waste water purification and the production of drinking water. Because of the broad variety in its projects, in procurement Waternet deals with a large quantity of different suppliers, as well as different supplier markets, in a national and international context.

4. The economic crisis, construction fraud and current competition in the Netherlands

In the past litigation in procurement has been almost non-existent for Amsterdam/Waternet, since contractors and suppliers preferred and favoured a steady business relation, and feared to compromise their chances in future procurement. In 2002 the Netherlands was captivated by the Dutch parliament’s investigation into wide-spread construction fraud. The investigating parliamentary commission concluded that building contractors illegally and on a large scale agreed on prices in public procurement, and therefore willingly excluded competition. It was estimated that an average of 8,8 percent of all government spending in procurement hence had been lost. The legal countermeasures of the Dutch government brought an end to most of this fraud, which left a Dutch constructors market with a new financial balance.

Furthermore, of course, the worldwide economical crisis has left its mark on the (construction) market in the Netherlands. According to the so-called Zürich Euroconstruct Country Report of 2009 the Dutch
construction market faces, after a relapse of 6 percent in 2009, another drastic decrease of 9 percent in 2010, and so on. This is significantly worse than the comparable markets in its neighbouring countries. Hence the construction market and the connected suppliers’ markets in the Netherlands nowadays are characterized by a certain hard-grained competition. The general understanding between procurement authorities and contractors comprises a considerable relational distance. Although formerly market and public administration often went hand in hand, construction fraud regulations concerning integrity cause civil servants to avoid most market invitations. This particular distance nurtures a mutual lack of confidence. Moreover, procurement authorities often encounter relatively low biddings in procurement, caused by the fierce competition between contractors. Many public authorities live under the impression that awarded contractors, bound to their own low tenders, are having difficulties realizing the profitability of the project. Therefore tenderers would sooner tend to proceed to early and far fetched claims concerning additional work. More often the lack of cooperation causes the standard of the performance provided to fall across the board. With the continuing economical crisis placing public expenditure under strain, the lack of mutual responsibility and trust of both market and public authorities has grown to give cause to swift conflict and litigation.

5. First step: renewed cooperation and mutual confidence

Both construction market and government budgets are under financial strain. The inherent growing emphasis on lowest price bids in procurement does not contribute to the improvement of the over-all projects quality. Neither does it encourage the cooperation between parties or the capability of the construction sector to innovate. The societal aversion against ascending costs of failure, against the long term building of infrastructural projects, and the resulting inconvenience and hindrances increases day by day. In 2011 almost all ongoing building projects in Amsterdam were drastically shut down, in order to evaluate the state of the amassed public inconvenience. Under these circumstances the procurement authorities are in fact faced with a practical choice. Continuation of the practice of using high standards in highly demanding contracts, tendering at the lowest possible price, or search for improvement and cost deduction in the process, including new possibilities for the market to come up with innovation. Choosing the second option, it has to be taken into account that it is essential for improvement and innovation that the common trust between the procurement authority and its contractors is reinstated. A positive basic attitude is an inevitable requirement, and market players need to be given all necessary means to be able to give their core input in procurement. Of both market and administration a renewed attitude is expected, pro-active, professional in knowledge and skills, and above all exuding flexibility.
Based on these starting points the independent knowledge network for construction in the Netherlands (CURNET), in cooperation with various contracting authorities, has developed the concept of Half-time.


Half-time can be characterized as a working method used by those involved in the preparation and execution of building projects, aimed at the prevention or constriction of hindrances by these projects in the nearby urban environment. Its main goals are improvement of accessibility, less inconvenience and hindrances, the prevention of wastage of resources, and economization of the process. Working with the Half-time concept stands for a shorter preparation period, and a faster execution of building activities in the public area. By quicker providing the building designs, or by a faster conclusion of the submitting of the needed licenses, a gain in time is achieved. Simultaneous and synchronized working processes of both constructor and public administration, abandoning the process of back to back planning, also lead to acceleration in the project. Especially this element comprises a challenge to tenderers. Moreover, an efficient digital system of agreements and engagements between the constructor and the contracting authority may contribute to cooperation and the speeding up of the process. Many contractors therefore accept working in Half-time as a challenge to their capabilities. Stimulated to develop more efficient ways of working, constructors achieve a gain in time, for example by working longer shifts in summer, using the extra daylight. A constructor can obtain a bonus if the work is completed ahead of schedule.

The key elements of Half-time in procurement are as follows. First of all the accomplishing period of the construction is set on a tight schedule. This tight schedule is the most important selection criterion in procurement. The prospect of a bonus is included in the bid for tenders. Introducing a mandatory malus system is also possible, but often less fit, because of the prescribed close cooperation between tenderer and procurement authority. Rather both parties can often be hold liable for a possible setback. In procurement conditions sound guarantees are offered concerning the intellectual property rights of innovations. According to many Dutch companies, particularly the open public character of procurement stands in the way of innovation on the Dutch market.

Subsequently the main elements in the implementation and execution of building activities are as follows. A mandatory close cooperation between the contracting authority and the selected tenderer is essential. Furthermore it requires mutual trust and reliance, and the unreserved willingness to be frank and honest towards each other. Procedural relay rides are prevented, as on all individual aspects of the project cooperation is required, from the first preparations until completion. Constructor and administration are working at the same table, on the same components of the project. The working process of the constructor is integrated in the working process of the commissioning authority. Therefore the use of a digital system of agreements and engagements during the project is compulsory.
Furthermore the actual accommodation of the administrations civil servants is realized within the accommodation of the constructor. Overall, everything possible is done to optimize cooperation. Building materials can be ordered in advance by the public administration itself, making it possible to control quality, terms and conditions of deliveries. Another successful experiment regards a so-called “just in time” delivery of materials, saving time and costs of storage. Finally, communication and management of the surrounding area is taken into very serious account. The close cooperation between the public administration and the constructor means to be sufficiently flexible to efficiently handle the reactions of citizens and nearby companies in the environs of the project.

7. Side-effect: innovation

This approach has a certain amount of measurable direct effects. First of all, in almost all projects a significant deduction of project and construction time is achieved (half-time). In addition one can say that in each project, to a certain extent, an optimization of costs is accomplished. The sheer reduction of transportation miles may serve as an example, being a direct consequence of the reduction of the lead time of the project and the close cooperation at the same physical location. For similar reasons, in most cases a reduction of the energy expenditure is achieved. Beside this, some less measurable but equally important side effects appear. An important side effect is that the positive basic attitude and close cooperation between those involved deals with differences and disputes in an early stage, causing a considerable decrease of judicial conflicts and litigation. The benefit of prevention of litigation related social costs and time is obvious. Furthermore an apparent improvement of competition conditions derives from the concept. Tenderers are enabled to put in their full know-how and expertise to win the contract and making it a success, no longer limited by a secluded vision of the tendering authority. The most important side-effect is innovation. Within the concept of Half-time those involved are challenged to revocate and revise the organizational long tried processes and techniques, and even reconsider their use of common building materials. Half-time offers an apparent stimulation of innovative techniques. Guaranteeing the intellectual property rights to tenderers is a prerequisite in procurement. That way tenderers are enabled to share within the Half-time approach their available innovative knowledge, and in addition to come up with new creative solutions and working methods. This is best illustrated by some examples.

8. Projects

In Rotterdam and Amsterdam, and by some other Dutch municipalities, the Half-time concept has been successfully applied.
Roudabout in the heart of Rotterdam

In the centre of the city of Rotterdam a huge roundabout has been built, providing traffic circulation for 35,000 vehicles on a daily basis. The intersection needed renovation, and amelioration of traffic security. Furthermore additional work was needed, in order to provide the long term low maintenance of traffic provisions. The Half-time approach has been chosen to realize a minimum impact for the traffic circulation, and a reduction of hindrances in the surrounding area. Moreover the city of Rotterdam was faced with a particular problem. The roundabout is part of a river embankment. Therefore the storm season had to be taken into account, during which building activities on the embankment are prohibited. The time schedule of the project became inevitably tight. The first gain in time was achieved in the planning stage. The planning stage was conducted in a fifth of the customary planning time. This was achieved by merging all disciplines involved in a combined preparation committee. For reciprocal communication among the various disciplines a standardized digital communication system was used, which has been specially developed for Half-time project structures. The communication system guarantees a fluid communication in accordance to clear and fixed agreements, registered in protocol. During the execution of building activities shift work was used, working up to eighteen hours a day, by both constructor and the concerned civil servants. Thus using an all-over flexible work force, a saving of no less than 35 percent in construction time was realized. Moreover, the additional requirement in procurement that the surrounding area should endure a minimal inconvenience of the building activities, has led to an innovative appliance of so-called cross medial communication. On special, for that purpose created websites, apps on smartphones and digital screens put up inside companies in the proximity, road traffic congestions were analyzed with the aid of real-time information by cameras, and exclusively developed software automatically showed alternative customized routes. This innovative manner of communication resulted in a verifiable reduction of 10 percent traffic congestion, making it possible to further speed up the project. The project remained within time, and within budget.

Roundabout in nine days.

The concept of Half-time has also been applied to a smaller degree on the construction of an intersection. The objective again was to minimize the hindrances for traffic circulation. Therefore in procurement both lowest bid and fastest execution of the project were selected as awarding criteria. In the tender documents the procurement authority made a maximum of 74 working days available for execution. Tenderers could earn an amount of 2000 euro for each day the tenderer could work faster. This rebate was fictitious deducted from the actual tender price. In this specific case the financial risk was subjected to the constructor, using a fine of 4000 euro for each day the project was delayed. On the other hand, ample preparation time was provided, offering sufficient possibilities to analyze the
surroundings, and to come up with a specific, detailed plan of action. The final result of the procurement included tenders ranging from 9 to 46 working days, with a rebate varying from 56,000 euro up to 130,000 euro. Nine days seemed improbably fast for the construction of a roundabout of this particular kind. To achieve this efficient use was made of a tight joint time sheet of both contracting authority and constructor, an optimal deployment of personnel and equipment, and the use of 24 hour shifts. Remarkable was an all-over use of specific risk profiles during the project. Setbacks in solidifying time of asphalt and concrete were taken into account in planning, and alternative scenarios were written in advance. Suppliers needed to provide a just-in-time delivery of building materials. By this valuable time and costs were saved, surpassing almost all usual storage efforts. The contractor has managed to finish the construction within a nine day period, in which traffic was hindered for only two days.

Replacement of a highway fly-over

The implementation of the Half-way concept on the replacement of a highway fly-over has triggered an innovation, that has been applied since then in an increasing number of other building structure projects. The main target was to realize a new elevated highway in half time, thus minimizing highway traffic problems. Taken into account that construction of a standard concrete bridge would take about a year, a fly-over built out of various alternative materials was accomplished in only six months, with only a single road closure during nighttime. The reduction of building time has led to considerable expenditure savings. The choice for an artificial composite highway surface instead of a common steel surface alone led to a saving of appraised costs of 15 percent. Not only saving construction time, the use of composite also assured low maintenance in future and caused a substantial emission deduction of CO2. The application of composite is more and more followed in other building structures.

Enlargement and improvement of embankments by Waternet

Waternet applies the Half-time concept to realize time and cost reduction in embankment projects. An important additional motive for Waternet is to open up for innovation in the European market, particularly on projects belonging for decades to the core-business of the organization.

9. Concluding

Within the framework of the Dutch constructing market, with both procurement authorities and tenderers under financial strain, a considerable relational distance has grown between public authorities and building contractors. By sticking to rigorous defined and excessive detailed tenders, developing problems in the tendering process and execution of the project often lead to judicial
conflicts and litigation. Half-time seems to be offering a solution, with mutual trust as a key-concept and entwinement of procurement authority and tenderer processes as an absolute requirement. Practically it turns out that with the right commitment of those involved considerable, significant deductions of project and construction time (half-time) and optimalization of costs are achieved, and tenderers feel challenged to innovate. So far the results are encouraging.

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Increased cooperation through immediate post contractual negotiation

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Abstract
Traditional contracting has been largely shown to cause adversarial relationships between client and contractor in the construction sector. This leads to claims during construction by contractors, which increase transaction costs for both parties in the form of policing and enforcement costs. In literature, partnering is widely advocated as a governance form to more cooperative relationships between client and contractor. The partnering approach, however, requires a significant investment in elaborating a specific procurement approach, and is therefore regarded as inappropriate for small, one-off, less complex projects which are of low strategic importance. Municipal governments in the Netherlands are searching for alternative solutions to increase cooperation with contractors and reduce transaction costs by applying immediate post contractual negotiations in traditionally procured projects. We studied four such municipal projects which have showed that immediate post contractual negotiations positively influence cooperation as it creates joint risks analysis and management, stimulates a reduction of design errors, stimulates design and planning optimization, provides a platform for joint problem solving, leads the contractor to involve key participants early in the process, and leads them to align goals and expectations. We observed these effects that partnering aims to achieve despite the initial traditional procurement procedures applied in these projects. These negotiations seem to reduce the transaction costs of traditional procurement making them particularly applicable in smaller projects where high set up costs would not be justifiable due to their limited size, complexity, or cost.

Introduction
Traditional contracting has been largely shown to cause adversarial relationships between client and contractor in the construction sector [1-4]. This leads to claims during construction by contractors, which increase transaction costs for both parties in the form of policing and enforcement costs. The current climate of austerity exacerbates this problem as fewer investments are made, margins decrease, and competition becomes ruinous. Various authors argue that cooperative relationships should lead to improved productivity, financial savings and create opportunities for innovation [3-5]. In literature, partnering is widely advocated as a governance form to more cooperative relationships between client and contractor. It does so by aligning goals between the parties, integrating contractor’s expertise in the design and planning of the project, involving key participants early, creating an integrated team, and improving communication. The partnering approach, however, requires a significant investment in elaborating a specific procurement approach, and is therefore regarded as inappropriate for small, one-off, less complex projects which are of low strategic importance, as the set-up costs simply do not justify an extensive collaborative approach [6, 7]. Additionally, the implementation of partnering is not always possible due to public procurement laws, making it particularly difficult to implement for government institutions [8]. The required investments are leading some municipal governments in the Netherlands to search for alternative solutions to increase cooperation with contractors and reduce transaction costs by applying immediate post contractual negotiations in traditionally procured projects.
Immediate post contractual negotiations are a meeting between the client and contractor directly after the project has been awarded to agree on an updated contract to reach a fixed price agreement or modify the design. In this paper we present the results of a study of four projects in which immediate post contractual negotiations were implemented. We evaluated the effect of these negotiations on the accuracy of project cost estimations before construction is started, maintaining product quality and increasing constructability, and the occurrence of discussion and renegotiations during the construction phase. Our results show that immediate post contractual negotiations have a positive impact on these effects as it creates effective risk transfer and management, stimulates a reduction of design errors, stimulates design and planning optimization, provides a platform for joint problem solving, leads to the involvement of key participants early in the process, and leads them to align their goals and expectations. Provided that there are no further scope changes during construction, the results show that the need for further discussions and renegotiation is removed. Awarding based on quality shows capacity to strengthen these effects of immediate post contractual negotiations as it increases the level of knowledge parties have before the negotiations are initiated, increasing their effectiveness.

The results show that post contractual negotiations achieve several components of partnering, despite the traditional initial procurement procedures applied in these projects. They show goal alignment between the client and contractor, joint problem solving, and the involvement of key participants during the design and planning of the project. The cooperative procurement procedures prescribed by project partnering literature were not obviously applied in these projects. We therefore suggest that immediate post contractual negotiations are an interesting alternative for partnering to transform adversarial into cooperative relationships in traditionally procured projects. These negotiations seem to reduce the transaction costs of traditional procurement making them particularly applicable in smaller projects where high set up costs would not be justifiable due to their limited size, complexity, or cost.

In this paper we show the effects of immediate post contractual negotiations by highlighting the importance of the problem of adversarial relations in construction, and the method we used to analyze the effects of post contractual negotiations. We follow this with the results of the study and discuss them in the light of partnering. We conclude the paper with suggestions for further research and the implications for practice.

**Background**

This study is an effort to provide more understanding in the creation of cooperative relationships in the construction sector in the dyadic relationship between client and contractor. Adversarial relations have plagued parties in the construction industry for a long time. Partnering is a concept in construction management literature that describes this fundamental shift away from the adversarial relationships in construction [9]. The implementation of partnering, however, proves to be difficult in practice as there is no unified understanding of the topic. The literature tends to give prescriptive accounts of how partnering should be implemented, yet the effectiveness of these measures is rarely examined [10]. Much of the literature, however, shows agreement on the components that describe a partnering relationship. Bygballe, Jahre [9] and Nyström [11] conducted literature reviews of existing partnering literature and conclude that the most prevalently discussed components of partnering include: common goals and objectives, mutual understanding, trust, joint problem resolution, commitment, continuous evaluation, and group working.

Partnering literature is replete with methods and tools to achieve these components such as appropriate procurement procedures [12-14], application of partnering tools such as charters, dispute resolution mechanism, teambuilding workshops and the use of facilitators. The purpose of partnering, however, is to create a deep seated cultural change towards creating cooperation, which implies that relational aspects must not be overlooked [15, 16]. As stated earlier, the implementation of adequate partnering tools require significant investment by both parties. Public procurement acts also make implementation difficult because public clients are restricted in the procurement methods they are permitted to apply [17]. Additionally, the effectiveness of implementing these measures is questioned, particularly in the case of small, one off contracts for small scale projects in which the required investments cannot be justified, it may even work counterproductive [6]. From this perspective, it is interesting to see whether alternatives to partnering are viable to stimulate the transformation to more cooperation between client and contractor in these small projects. This study aims to fill this gap by investigating the effects of an alternative approach with similar goals: immediate post contractual negotiations.

**Method**

The research presented in this paper was undertaken to evaluate the effects of immediate post contractual negotiations in several municipal projects. The aim of the clients in these projects was to increase cooperation with the contractor and in some cases to take advantage of contractors’ knowledge in the final stages of the design phase. To this end we evaluated the effects on visible aspects of this: the accuracy of project cost estimations before
construction is started, maintaining product quality and increasing constructability, and the occurrence of discussion
and renegotiations during construction. It was carried out for a master thesis graduation project at the faculty of
Construction management at the University of Twente. The projects studied were local projects run by
municipalities in the local region. We particularly chose municipal projects because partnering is considered too
expensive for the majority of their projects, as they are too small. Data was collected from four case studies in
which immediate post contractual negotiations were applied. Three of the studied cases were relatively small
projects which could be considered as routine and of less strategic importance. These projects, which we will refer
to as projects A, B, and C were street refurbishment projects in low density residential areas including subterranean
replacement of sewers, pipes, and cables. These projects had the following conditions:

- Project A: The project was awarded selected on basis of the lowest price tender for a completed design.
  Immediate post contractual negotiations were initiated after the project was awarded. The project cost
  approximately €500,000.-.
- Project B: The project was awarded on basis of the lowest price tender for a completed design. The post
  contractual negotiations were initiated after the project was awarded. This project had a total cost of
  approximately €600,000.-.
- Project C: The project was awarded on basis of quality for a completed product design. The selection
  procedure asked tendering parties to include a process plan, a risk plan, and potential value-adding
  measures. The total costs for this project was approximately €300,000.-.
- After the procurement process and after the projects were awarded; the involved parties conducted
  immediate negotiations to reach a fixed price agreement; in which design risk was transferred to the
  contractor. The fourth project was of a larger scale, and was a more strategically important project as it
  was located in a plaza surrounding a busy railway and bus station which was refurbished including
  underground works. We refer to this project as project D.
- Project D: The project was awarded on basis of quality for a provisionally completed design. The selection
  procedure asked tenders to include a detailed process plan and a risk management plan. Immediate post
  contractual negotiations were announced before procurement, where the client had the intention to increase
  the constructability of the design with the contractor. The total costs for this project was approximately
  €2,500,000.-.

Data from these projects was gathered using document study, central evaluations with both client and contractor
present, and qualitative interviews with key participants in these projects from both the client and contractor. The
studied documents included procurement documents, meeting reports, budget reports, cost reports, and change
orders. In total, spread across the case studies, information was gathered from 17 key participants in these projects.
Data gathered from the document study was used to develop semi structured interview and evaluation guidelines for
each project. The evaluations took approximately 90 minutes each, the individual interviews 60 minutes each and
all were transcribed by the author. The data was collected in Dutch, and the quotes have been translated to English
by the author for the purpose of this paper. The study provided some interesting results as elaborated in the
following section.

Findings
In this section we present the effects we observed in the various case studies of immediate post contractual
negotiations on the accuracy of projects cost estimations before construction, the level of product quality, and the
occurrence of discussions and renegotiations that occurred during the construction process. The findings show that
immediate post contractual negotiations reintroduce a period of planning into the construction process in which the
goals of the parties are aligned, problems are jointly solved and key participants from the contractor are involved.
Due to this, a more accurate cost estimation is made, and risks are better defined and managed. We observe a
remarkable decrease in discussion and renegotiations during the construction process.

Goal Alignment
Through the application of immediate post contractual negotiations, the goals between client and contractor are
aligned. This effect was achieved by the clients in all projects where they transferred design and stagnation risks to
the contractor during these negotiations. Through this the contractor no longer has an interest in claiming, as they
are responsible for any delays and design errors. This arrangement was defined in an amended contract which
concluded the immediate post contractual negotiations.

The transfer of these risks resulted in a project phase devoted to a detailed risk analysis and problem solving in all
projects. The initial effect of this was that the contractors in these projects recalculated the design and the bill of
quantities associated with the design to gain a more precise understanding of the project. In projects A and B this
happened directly after the project was tendered. In projects C and D, the client and contractor did additional design
work before doing final calculations. In all cases; the project leader of the contractor responsible for the
construction of the project looked at the bill of quantities and made sure it was correct. Remarkably, the contractors
did not experience this as a large risk. This was mentioned by three of the contractors, “If we recalculate all the quantities, then it isn’t really a risk for us anymore. We can get a very precise estimation of what products will need to be applied.” (Project manager projects A, B, and C)

As a result, the contractor removed errors in the designs and corrected the associated costs. In project B, these recalculations led to a minor increase in costs attributed to mistake correction. For projects C and D costs increased, but this is mostly attributable to the design changes that were implemented during this phase. Remarkably, in project A, the costs were reduced due to recalculation. In this case, the contractor recalculated the units in the bill of quantities which were overestimated in the tender, and valued the risks below what was predicted during the tender, because he had control over the management of them.

During construction, due to the risk transfer, the contractors were obliged to pay any deviations, provided they were within the design scope. In projects A, B, and C the contractors indicated that deviations were insignificant and that the changes that did occur were to the advantage of neither party. Project D, however, did not go so smoothly. This project was conducted under high time pressure, political pressure, and was more complex than projects A, B, and C. As a result, the construction phase was initiated before the preparations were complete. During construction, there were significant scope changes in the project, which led to the inclusion of new parties working in the project zone, and significant alterations to the design. As a result, the cost indication that resulted from the negotiations was inaccurate.

The result is that in projects A and B, the contractors had no need for maintaining a list of changes and mistakes during construction. The lack of attention to money during the execution process for the client reduced potential discussions throughout the construction phase, as stated by the clients: “It was really nice that we could just focus on the work. The costs were already arranged, so we didn’t have to discuss about that. We could just do our work and solve any problems that occurred (Project leader, project C)”, and “The biggest difference is that we didn’t have to sit together and calculate the extra costs that were made every week. That saved us a lot of discussions and time (Project supervisor, project B)”.

This resulted in fewer discussions during construction. One contractor states, “We only had two meetings during the entire process. We never had a reason to come together and discuss problems; we had already solved them beforehand (Project B).” In these projects we observed that within the scope of the contract, there were very limited cost overruns in projects A, B and C. As the contractor of project A puts it, “We took actions that we should always take. The only difference is that now we are much keener to do it, because if it went wrong, we were the ones paying for it.”

In project C, the fixed price arrangement wasn’t translated correctly to an accurate contract; leading to some confusing about the agreement during construction. This was especially the case because there was a project management transfer between the planning and construction phase on the client side. This lead to some inconsistencies in the application of the contract, meaning the client initially made some payments that were not necessary. This situation was, however, quickly corrected amicably. The end result was a cheaper than anticipated project, despite these inconsistencies.

**Joint problem solving**

The period of negotiations provided the client and contractor with a platform to analyze the project risks a second time and make more detailed estimations of these risks. In all projects we observed that parties made purposeful risk allocations, allowing the parties to identify the risks with the parties that are best able to manage them. This has been applied in these projects with varying levels of effectiveness. During the negotiations, parties discussed potential risks in the projects and jointly developed strategies to deal with these risks. This lead the parties to optimize the process, transfer some of the project risks, allocate budget for risks and in some cases even partially redesign the project and planning due to the integration of contractor knowledge. The risk allocation in the projects was as follows:

- In project A, the contractor priced all the risks. The only risk the client took were the ground conditions, meaning that the client would have to pay if the ground required sanitation.
- In project B, the contractor and client took a close look at the risks in the project. They determined that there was significant uncertainty about the condition of a sewer pipe connection, which they were unable to survey beforehand due to a concrete encasing. The consequences of this risk were estimated at approximately 10% of the total project. The client and contractor made a joint estimation of this risk and included this in the cost estimation for the project.
- In project C, the contractor took an active role in preventing the risk of tree roots hindering the construction process or damaging the quality of the final product by developing a redesign of the street.
- In project D, the contractor actively managed the risk of surrounding inhabitants. They developed and applied an extensive plan to ensure access to the train- and bus station for travelers, manage bicycle parking effectively and inform the surrounding entrepreneurs of the construction works.
The data shows that this risk analysis leads the client and contractor to make a more accurate set of cost estimations. The involvement of the contractor in the risk analysis ensures that more risks are discovered and planned for during the preparation phase. The initial design developed by the client in project C, for example, did not consider tree roots. Along the entire road, the trees had large roots which could interfere with construction works or damage the newly constructed road during its lifetime. The contractor developed a new design for this to avoid this and reduced the construction costs by smartly integrating the sewer system into this design. In project B it became apparent that there was a significant risk that a sewer pipe connection needed to be replaced which was encased in concrete. The client and contractor decided together what the cost of such a risk would be, giving the client a more accurate insight into the costs overruns that could occur during construction if this risk were to present itself. As a result there was no discussion or renegotiation necessary during construction when it became apparent that the sewer connection would pose cost overruns. At the end, the costs of these risks were quite accurate, with only minor deviations from the risk budget in projects A, B, and C.

In project D however, contractor and client did not discuss the largest risk: the third parties that would be working in the construction zone. They did not develop a strategy to deal with this, and due to the time and political pressure described earlier, this was rushed to start construction early. When third parties were included at a later date, there were design conflicts with works that were already constructed. For example, the concrete of the plaza was already poured when another party indicated that they needed space for foundations to place the bus station. Additionally, the late integration of these third parties led to planning delays, as products could often not be delivered on time. For example, the traveler information signs for the bus station were not placed until several months after construction was completed. The integration of these parties led to scope changes and planning changes which made the effects of the risk effects negligible. The result was a process in which 137 change orders were processed, many of which originated from the client. The parties quickly devolved back into a traditional working style in which cost overruns were discussed every week leading to frequent renegotiations.

Involvement of key participants
All the studied projects show that knowledge of the contractor is used during post contractual negotiations to improve the planned construction process. The contractors achieved this by including their executing project managers in the negotiations to develop smarter solutions for the process. For example, in projects B, C, and D, phasing plans were discussed during negotiations and improved due to input by the contractor. In projects C and D this was expected as they were tendered with selection based on quality, where contractors were asked to create a phasing plan for the project. In project B, this was not the case and it happened without prior input. During post contractual negotiations it became apparent that phasing would be an issue, as it was a 1000 meter long stretch of road with no side roads connecting to it that needed to be refurbished. As a result, the contractor developed a process to ensure that all residents would be able to reach their homes despite the construction works. In all three projects, the phasing plan was discussed in detail between the client and contractor. Additionally, in projects A and B, the contractors suggested to reuse existing materials within the project. In project A and B the contractor suggested reusing the soil within the project. In project A the contractor suggested reusing part of the clinker bricks in the road. These modifications saved the client money in both cases. Three of the project managers claimed these contributions were due to the different viewpoint they have of the project, as they are the executing party. As the contractor in project B stated, "[The contractor] looks differently at the project, because he will be there standing in the mud for 6 months to execute this plan."

Redesign seems to be stimulated by selection based on quality. In projects C and D we observe that selection of quality stimulates the contractors to develop a plan to execute the projects more effectively, and prove to the client that they have intimate knowledge of the project and the area before they are selected as a partner. With this increase in knowledge they are more effectively able to conduct post contractual negotiations. In project C, for example; the contractor had developed a phasing plan consisting of five phases that ensured residents in the area were always able to reach their homes. In project D, an extensive area management plan was developed by the contractor to ensure that people were always aware of the construction works being performed and to ensure access to the shops in the area and the train station at all times throughout the process. This was clarified by the contractor of project C who stated, “Well, to win the tender with a high quality score, we sent our executing team to the location to talk to the locals and take a good look at the project site, these guys look at a project in a completely different way and develop solutions that we wouldn’t consider in a normal tender.” This was confirmed by the client in this project, who stated, “Normally in a project like this, the contractor needs startup time to get used to the project. Now, with these negotiations, I saw that right from the start he knew everything, and was able to work at his best from day one (Project leader project C).” In project D the contractor improved the design of a water retention basin under the project used to collect rainwater from the plaza. The client had developed an expensive design to deal with this. The contractor improved and simplified the design during post contractual negotiations. This solution was half as expensive as the one the client had suggested, thus saving the client money.
**Summary**
Post contractual negotiations show remarkable effects on the cooperation between client and contractor. By introducing a period of planning into the construction process in the form of negotiations, the parties align their goals, jointly solve problems before construction is started and effectively integrate the contractors' expertise into the design and planning of the project. These results show an interesting parallel with the goals that partnering aims to achieve which is worth exploring.

**Discussion**
The results show that there is a remarkable change in the way that contractor and client interact during the construction process when negotiations are condensed into a single period of time immediately after the project has been awarded. Conducting such negotiations introduces a period of planning into the construction process in which the goals of parties are aligned through risk transfer, and a more accurate estimation of costs is developed through redesign, process optimization, and joint risk analysis. We show an overview of the effects of the immediate post contractual negotiations in Fig. 1.

We note that projects A, B, and C show remarkable changes in the interaction between client and contractor throughout the process due to the immediate post contractual negotiations. The initial intention of these negotiations was simply to gain a better insight into the price of the project beforehand to reduce discussions during construction and perhaps improve the execution process of the projects. While the findings support an improvement in these aspects, the results also show a remarkable resemblance to a number of the partnering components discussed earlier.

We observed that the risk allocation that takes place during these negotiations creates common goals and objectives. Once the risks are transferred and established in a new contract the contractor is responsible for any overruns and delays, provided that the project scope remains fixed. It is no longer in the interest of the contractor to stagnate the process through claims, as he will bear the costs of this. Taking this risk also appears to stimulate the contractor to improve the construction process. The risk allocation ensures that during the weekly meetings between client and contractor, there is no discussion about cost overruns as they have become irrelevant. Instead, the parties use these meetings to jointly solve any issues that may arise. We observed that the irrelevance of these costs during these meetings allows the parties to reduce the amount of meetings that they have during construction, reducing transaction costs.

![Figure 1: Overview of the effects of post contractual negotiations](image)

The reallocation of risks during the negotiations leads the client and contractor towards making a joint risk analysis which gives the parties a more explicit insight into the risks. This allowed the parties to make joint decisions about these risks and plan for them in the process and budget. When the risks become a problem during construction, there is fewer discussion and no renegotiation, because both parties were prepared for it and budget has been allocated for it.
The negotiations also allow the contractor to influence the design and optimize the process, which has a risk reducing effect for him and has shown to create cost benefits for the client in these projects. This is especially apparent in the projects which were awarded on quality as we see evidence that this leads contractors to develop design changes or process improvements to improve their odds of winning the tender. The effort put into the process of winning the tender on basis of quality increases the knowledge contractors have before negotiations are started, improving their effectiveness.

The negotiations cost the parties resources at the beginning of the process. These costs, however, appear to be recovered quickly, as weekly discussions about cost increases become superfluous. Instead, the client and contractor focus their time on jointly solving the problems that occur during the project to minimize their impact on the process. Additionally this reduces the administrative overhead for both organizations because fewer transactions take place. The reduction in design errors and other discrepancies, the improved knowledge of the construction process and risk responsibility for the contractor reduce the occurrence of issues during execution.

In one project we find mixed results. This project was executed under significant time and political pressure which caused the parties to wrap up the negotiations and start construction while there was still a lack of clarity about the project. During construction the scope changed significantly and new parties were introduced which had a significant impact on the process and project costs. When these parties were added, there was no new round of negotiations and instead, this project devolved back into the traditional, adversarial relationship that negated many of the positive effects seen in the other projects.

**Conclusion**

This paper has shown that immediate post contractual negotiations are an interesting alternative to partnering in small, one-off projects. It has shown that in the studied projects, clients gain increased insight into project costs before construction starts, that clients can better take advantage of contractor knowledge and insight in the construction process, and that discussion and renegotiation that occur during construction are minimized resulting in lower transaction costs. It stimulates joint problem solving both during the negotiations phase and the construction phase. In the cases where we observed renegotiations during construction; the data shows that this is usually caused by significant scope changes or by risks that were identified during negotiations. In the latter case, the client budget has been prepared for it, preventing the negotiations from regressing to adversarial relations. The negotiations align project goals of both parties. As a result; since the parties are working towards shared business goals, their adversarial relationship makes way for more cooperation, without the requirement for significant investments in changing procurement procedures.

In practice, these findings provide construction managers with an additional tool to avoid adversarial relations with contractors in small, low complexity projects of lower strategic importance. Creating more cooperation allows clients to benefit from improved problem solving; a higher quality execution process exemplified by fewer discussions and renegotiation, and it creates cost benefit for both parties by reducing transaction costs. We recommend further research to confirm these effects in other organizations. Additionally, it would be interesting to see whether immediate post contractual negotiations are a viable alternative to partnering in larger, more complex projects.

**References**

Electronic Procurement Warranted Process Re-engineering
A Case study of Indian Railways

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1 Introduction

1.1 Overview

Indian Railway (IR), a government owned transport organization, procure and distribute $550 Billion worth items every year to its transport business across the Indian sub-continent. The materials are procured centrally by the zonal Railways and distributed to the end users through the network of 268 Stores Depots spread across length and breadth of the Indian Railways. Apart from centralized public procurement (PP) the field units are delegated with powers to procure upto $5000 per item depending upon urgency and if the item can be more conveniently procured and arranged locally. The zonal Railways can decide contracts upto $25 million per item and above this value contracts are entered by the zonal Railways after getting sanction from the Railway Ministry. A brief profile of IR is brought out below [1].

Indian Railways Profile Fast Facts

| Total outlay for the year 2012 | $12 Billions |
| Total number of employees | 1.4 millions |
| % of PP personnel over total staff | 1% |
| Number of stocked in the IR warehouses | 45,000 |
| Inventory turnover ratio | 20% |

Assets population of IR

<table>
<thead>
<tr>
<th>Stations</th>
<th>Bridges</th>
<th>Locomotives</th>
<th>Freight Cars</th>
<th>Route Kms</th>
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</tr>
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</table>

Daily transport business turnover of IR

<table>
<thead>
<tr>
<th>No. Freight trains</th>
<th>No. Passenger trains</th>
<th>Passengers transported</th>
<th>Freight Transported</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>7,000</td>
<td>12,000</td>
<td>23 millions</td>
<td>2.65 million tons</td>
<td>$ 58 millions</td>
</tr>
</tbody>
</table>

Source: IR Year Book 2012 & IR budget

1.2 Targets and objectives of Material Management of IR

The public procurement (PP) function of the Indian Railways (IR) caters to the material requirement needs of IR’ public rail transport service operation and maintenance and also supports in the manufacture of assets such as rail coaches, locomotives, wagons, wheels, rail equipment, spares etc. required for the transport business. The PP requirements for operation and maintenance are more fluctuating than the asset creation material requirements. For the easy managing of the vast IR, the whole network is divided into 17 zones and for assets manufacturing 6 product specific production units (PU) are functioning. Each zone and PU is placed under a General Manager who functions as CEO with 11 different functional departmental heads under him. The PP functional head is designated...
as Controller of Stores, under him four tier organizational hierarchy of material managers serve for the PP functions. The procured materials are received at different user points in the Railway network and each such unit warehouse and logistics function is under a separate Material Manager who is also delegated with limited purchase powers of procurement to rise to urgent local needs of the field units. The vendors execute their supplies direct to the user point warehouses on receiving the Purchase Orders (PO) from the PP office.

The organization’s Public Procurement department chartered objective is to arrange materials at the right time, right place, at the right price at the most efficient, expeditious manner possible. The target is towards ensuring 100% availability of all items required for the Railway operations. The internal target fixed is 100% availability of vital/safety/passenger amenity items and at least 95% availability of other items. As most of the Railway material is supplied from the oligopoly market, the challenge faced is right sourcing of the material, which is one of the reasons for the items going out of stock. Secondly, the operation and maintenance activities demand fluctuates sometimes due to various reasons that make the item out of stock. When the item goes out of stock and if the item is readily available in the market, procurement is made immediately as otherwise lead-time is a constraint, which varies from one day to up to 24 months for some items like Rails, imported items.

1.3 Procurement Policy of IR

The entire Indian Railway procurement function is not on a single platform system and each zone duplicates procurement of same item in the year for the quantities required for each zone. The procurement is fixed period model with reviews made annually. For this the entire items are divided in such a way that, each month an equal number of items will be taken up for procurement and review. Under the ABC inventory categorizations, for A&B category items, the procurement at a time is made for 12 months requirement with staggered deliveries as required and for low value C category items, two years requirement is covered at every PO stage to have control over ordering costs vis-à-vis inventory carrying costs. For this every month demand estimate sheets are generated by the computer centre from the updated databases and sent to procurement office for entering into contracts. The procurement policy of IR is governed by General Financial Rules (GFR) issued by Finance Ministry, Indian Railway Standard Conditions of Contract, Indian Railway Stores Codes and the Rules and Regulations issued by Railway Board from time to time.

2. Problem Context and background

With the advent of ICT initiatives in Public Procurement, e-procurement implementation by governments are mostly perceived as just compliance objective, instead of developing holistic methodology to integrate the end to end procurement processes. Indian Railway procurement is unique with strategic objective to ensure materials of round the clock transport operation across the country. The public procurement and warehouse information repository such as PP office data, warehouse stock and transactions data were being maintained in each zone/PU in the mainframe computers since the year 1963 without any networking among the mainframe computers and also with the PP offices. Microprocessor based PCs were inducted in IR only in early 1990s mainly for simplification of PP functions office work (excepting few in-house software system developments adopted in some units) without any attempt for automation and leveraging the ICT till 2003 initially.

Last five years inducted e-procurement reforms has provided rich opportunities with paradigm shift to procurement entities and supply chain nodal centres in developing an effective supply chain by re-engineering the processes. Re-engineering necessitated an integrated system that is accessible to the procurement office, warehouse, corporate office, end user, other procurement entity in the network, vendor, finance manager, data/archives centre etc. E-procurement in Railways warranted obliterating, simplifying, adjusting, modifying, optimizing and integrating the prevailing manual processes to re-engineer new business strategy process to derive maximum benefits of e-procurement.

In the above context this experience study objective is to bring the methodologies adopted through the ICT that facilitated in improving the PP effectiveness with a reduction in TCO of the PP framework functions, better availability of materials, minimum order cycles, lesser paper work, lead time and inventory reductions, process traceability and visibility, improved response time to meet the user/stakeholders needs, real time performance measurements etc by way of Business Processes Re-Engineering in e-Procurement.

2.1. Look back the Old System

From the receipt of estimate sheet, the procurement process starts in the procurement office through various modes of tendering and its finalization based on exigencies and value of the purchase. For each category of stores, a separate procurement section in the PP office is functioning such as Mechanical, Electrical, Consumable items etc. The mainframe computer is meant for the entire zone departments and for purchase works, a separate
platform of server with hardware is available in the PP office. Different types of tenders such as open, limited, bulletin, single tenders are processed in the procurement office. From a demand to PO the maximum time is taken for open tender cases is upto 180 days.

In the earlier system except using the mainframe computer as a repository to the PP information after feeding the voluminous paper data created in the day to day processes in the PP framework, the PP function was managed at various places through manual creation of files/records in the offices without any automation. The procurement of each item’s requirement was made on yearly review (fixed p-model). For this the entire list of items for procurement were split into equal 12 batches, so that each batch comes for review every month. As the mainframe is not connected to the PP functional points and warehouse there existed back and forth paper movements among them.

2.2 Procurement processes in IR

2.2.1 Roll out of MMIS and IREPS in IR

Indian Railway was one of the first few government departments to introduce computers in the country. Computerization on Indian Railways started in the late 60s with the induction of IBM 1401s in the nine zonal railways, three production units, and the Railway Board. Many applications were computerized such as Passenger Revenue and Goods Accounting, Financial Management, Inventory operating statistics etc. While these systems proved to be beneficial to the Railways, they were soon found to be inadequate to cater to the increasing requirements.

IR started computerization using the auto coder in the early 1960’s and then moved on to COBOL. In January 1984 a comprehensive Material Management Information System (MMIS) for better inventory control and stores purchase was designed by the System Development Group, Central Railway, for implementation by all zonal railways. The package covers processing of vouchers, generating Priced ledgers, class ledgers and various exception reports. It also covers purchase processing, demand generation, forecasting and generation of various exception reports.

During late 1990s Railways have switched over from their old systems, using COBOL programming, to Relational Database Management Systems (RDBMS). Today they IR have several application packages running on mainframe computers, minicomputers and personal computers. The application packages cover Accounting, Financial Management, Inventory/Store management, Payroll, Personnel and Administration and Decision support systems/MIS.

Railway Board in November 1997, decided to form a Systems Development Team on Central Railway to develop new MMIS applications on an on-line environment making use of an RDBMS and new hardware systems. Once the system was fully implemented on Central Railway, it was proposed to be transferred to other Zonal Railways. M/s Computer Maintenance Corporation (CMC) has under taken the task of development of software in Oracle. It has mainly five modules i.e. the finance, purchase, sales and auction, depots and uniforms module. The finance module comprises the various functions and responsibility of stores accounts branch. The purchase module caters to the demands sent by various depots and generation of purchase orders against those demands. Sales and auction module is related with scrap disposal. Depot module takes care of stocking and custody of materials needed by railways and to be sent for other depots respectively. Uniform module relates to stitched and purchased uniform items.

After introduction of IT Act 2000 in India, under National e-Government Procurement mission (NeGP) objective, the vision to augment the ICT for PP functions gained momentum later and software named as Material Management Information System (MMIS) and Indian Railway Electronic Procurement System (IREPS) was developed through IBM and was commissioned in phases in each zone/PU from 2004 onwards and now the new systems implemented and got stabilized recently in all the Zones/PU. Materials play a vital role in Railway’s operation, maintenance and In-house production activities. Material Management ensures timely availability of stores to the users and it involves different stages viz., planning and programming, purchasing, inventory control including, inter-alia, receiving and warehousing, transportation, material handling and disposal of scrap. The primary objective of Material Management is to ensure better user satisfaction by making available the right quantity at the right time, without unnecessary blocking up of capital.

While the MMIS facilitated the process automation and simplifications with enhanced PP efficiencies in the PP offices and warehouses, the PP commercial bidding process with the markets, necessitated IR to switching over to an in-house developed e-procurement system through commissioning of Indian Railway Electronic Procurement System (IREPS) in a centralized server at the national capital. It catered to the IR common PP
functions such as tender solicitation, vendor registration, and interaction with the stakeholders for PP decision making besides acting as central repository. Induction of MMIS & IREPS necessitated several modifications and adjustments in the PP functional framework in contrast to the erstwhile PP old systems. Induction of these ICT tools necessitated to PP process re-engineering adapting to the latest trends of the industry benchmarks to enhance the PP effectiveness.

2.3 Study Methodology

Each process in the e-procurement is mapped in compliance with the present process rules and purpose of the action in the manual procurement process. The process cycle in each stage of procurement is diagnosed to identify the problematic areas requiring re-engineering. Thereafter the processes warranted obliterating, simplifying, adjusting, modifying, optimizing and integrating the prevailing manual processes to re-engineer new business strategy process to derive maximum benefits of e-procurement. Each stage of workflow of ‘as is manual system’ is compared and their modified processes are analyzed in section 4.

3. Literature review

Reengineering is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance such as cost, quality, service and speed. Process is a structured, measured set of activities designed to produce a specified output for a particular customer or market. It implies a strong emphasis on how work is done within an organization [3]. Governments across the globe are in a fast phase of embracing the ICT to deliver good governance. One of the function of any government is conducting public procurement which not only serve the government purpose of acquiring goods, works, service, but it also triggers the economy in way the government approaches the procurement with its policies. In the course governments has to think in advance what system corrections are warranted while introducing any ICT system.

The introduction of e-governance entails streamlining operational processes, transcribing information held by government agencies into electronic form, linking disparate databases, and improving ease of access to services for members of the public. The desired goal is streamlined sharing of information between government agencies to conduct government-to-government (G2G) transactions in order to simplify the navigation of government-to-citizen (G2C) and government-to-business (G2B) transactions. E-governance systems can be designed to increase competition, reduce discretionary power, remove bottlenecks in routine transactions, increase reliability and predictability of government actions, ensure better and equal access to information and services, and promote transparency and accountability [4].

E-procurement is commonly defined as the use of ICT to automate and make more responsive and dynamic the purchasing process [5]. E-procurement should be interpreted both as a product and as a construct for human action, which interacts with institutional and rule structures to generate or enforce existing constraints on the everyday behavior and choices made by users. Within this framework, e-procurement is both a course for delivering goods and services to the consumers more efficiently, while at the same time transforming the process, including the individuals involved, by making them more effective in the discharge of their responsibilities [6].

3.1 PP Life cycle in e-procurement

The processes involved in PP are in Figure-1 starting from demand to an item to again realization of next demand after the procured item is consumed. In order to understand the e-procurement process further, it is necessary to know the system elements and the purposes for which these modules are accessed by different stakeholders in conducting the procurement function.
Electronic procurement involves various stages and modules in achieving the end-to-end automated system. It has to conform to the framework of the public procurement policies and comply with the rules of the State. Typical E-Government Procurement (eGP) system consists of many modules which are interlinked and that are as follows [7]:

- Centralized Registration (Contractors/Suppliers/Procuring Entities and other stakeholders eGP)
- Workflow management System
- E-Contract management System
- e-Payments
- Procurement Management Information Systems
- System and Security Administration
- Handling Errors and Exceptions
- Application Usability & Help

Any process whether it’s manufacturing or office procedures involves various actions by different elements and stakeholders to be conducted in a specified manner to achieve the desired goal. E-GP System will be based on a workflow-based Collaborative government procurement platform. All the stakeholders/Actors of the procurement process will have appropriate access points and will get working dashboards with authorized functions in eGP System. The e-GP System shall support the following user categories for stakeholders/actors initially and provides them the secured access to related functionalities of the eGP System through dashboards [7]:

1) General Public for Public Procurement Public Information
2) Tenderers/Contractors/Suppliers/Consultants
3) Procuring Agencies/Entities
4) Payment Service Providers (Scheduled banks)
5) Development Partners
6) e-GP System Administrators and Auditors
7) Operation & Maintenance partner
8) Evaluation Committees (Technical and Commercial)
9) Media community for updates, announcements, news releases etc.

3.2 Need for BPR in e-procurement

To the world and business are information system based. The strategic decision making has shifted from the intellectual regimen to relying on information. In all countries government is a substantial part of the national economy, and shifting its business activities of procurement and construction online has the potential to provide major impetus to the rollout of new technologies throughout the economy. However, the operational benefits of technology for the governance and efficiency of these business activities is beyond question. Installing new technology can be simple, but experience has shown that extracting maximum benefit involves governance, management, organizational and behavioral changes which are almost always complex [7].
Government should take the initiative to provide a context for the development and implementation of the e-procurement system. The key issue here is the extent to which e-procurement systems are being developed so as to be compatible with a longer-term national government e-procurement strategy and integrated into an overall government e-procurement strategy. The vendors should be provided with all procedural information, coaching, and hands-on experience to users before or on system procurement. This will furnish users with an operational knowledge of such systems, thereby creating some level of confidence in them to adopt the system [7].

Any change in system ought to attract the resistance to change and challenges to implement within the specified target. In the public sector, the risks associated with e-procurement may be even higher than those in the private sector, because economic and social factors influence the administrative, political, and structural contexts in a singular way since the public procurement process is highly controlled, regulated, and influenced by public policies. Therefore, the public e-procurement implementation should be conducted more carefully, because depending on how it is implemented, there will be organizational and political implications that according to how the process configuration is established, the political, organizational, and institutional structures will be reinforced or a total transformation will take place [8]. The use of an electronic process to conduct public buying has occurred in many countries, although with a great waste of resources due to a lack of knowledge about how, in fact, the process itself happens. Besides, not all nations develop e-procurement equally, as different standards exist [9].

Organizations including governments to simplify and achieve better governance are continuously implementing computerized solutions. The digital platform will most likely automate existing processes, thus enforcing extant constructs and limiting the probability of achieving more accountable, responsive or democratic systems. It is regularly the case that administrative and democratic hopes placed within the realm of innovative use of technology in public procurement remain unfulfilled as users incorporate technology within established structures, hence reaffirming the status quo [10].

Employing ICT is not enough in achieving harmonious operation and integration. E-procurement, like most ICT dimensions, is not deterministic in character. The lack of statistical difference in historic experience with e-procurement among groups with integrated and non-integrated platforms suggests that if the integration of digital procurement is not undertaken during e-procurement’s initial adoption, it is likely that it will not happen down the road [10].

The progress available through e-procurement is only realized when the system is used in an effective ways. Process re-engineering is not enough as different beliefs, expectations and practices may exist. Definitive policy and strategic framework can provide clear rules and guidelines to stakeholders that can help transform the socio-technical and socio-political environments. Typically, an incremental introduction of e-procurement tools can ease the transition to an e-enabled environment. However, policy that mandates common purchasing strategies and methods provides the best results. Overall, an integrated approach between whole-of government and e-procurement initiatives can create a functionally coherent network of policies and standards; minimize competing priorities and objectives; and promote balanced benefits for all stakeholders [11].

E-procurement is a technical implementation that enables the transformation of organizational structures and workplace practices. Flexibility in the development and enablement of the associated systems and processes allows the diverse requirements of stakeholders and participants to be recognized and supported. This may include tailored training for buyers and procurement support staff as well as the ongoing reviews of the associated processes and tools. By staying aware of participants’ needs, support organizations can build, evolve and manage systems and processes that allow buyers to purchase goods and services from preferred suppliers [11]. All these rationale necessitate the organization, that embrace e-procurement to evolve strategies to carry out business process re-engineering of each of the activity of the public procurement function.

When the use of e-procurement has not been legitimized as an expected institutional characteristic, there will be low diffusion and integration levels. One could argue that at this point in the evolution of e-procurement, the areas where significant benefits could be obtained are underutilized or not utilized at all. The digitalization of the procurement process simply automates the processes rather than generates strategic capabilities. The limited integration level across the organizational spectrum of procurement severely limits the impact of e-procurement and reduces it to “just another tool” in the tool box [12]. So the organization adopting e-procurement has to adapt their procurement processes shifting from the manual procurement requirement to e-enable processes through reengineering.
3.3 Concerns and Challenges in e-procurement process re-engineering

Many suggest that ICT and specifically e-procurement will transform governance, but digitalized public procurement alone has not yet led to significant transformative changes. The current state of e-procurement is primarily focused on automating existing internal processes and procedures. Unsuitability of software platforms that were originally designed for private sector applications, organizational resistance to change, lack of strategic systems’ integration and failure to involve public procurement professionals in the design of an e-procurement system were identified as the primary obstacles of effectively implementing e-procurement. In order to capitalize on the potentially transformative nature of ICT in procurement, policymakers, system designers, and procurement professionals must take an active role in the design of the software, but more importantly they must be actively engaged in the process changes that must take place to successfully implement the system. [8]

The development and implementation of electronic commerce business models, such as a procurement portal in organizations is a challenge that goes beyond mere technological functionality. Top management support, organizational adaptation, and training of employees are examples of critical issues for the successful implementation of any IT-system. For the implementation of e-procurement in the public sector, an extra set of factors is considered to be influential. These include the financial risk, risks in building the portal, and legislative issues. The KPI are the definition of an e-procurement strategy, re-engineering of procurement processes and management of expectations. The re-engineering of processes in the public sector is in itself a very demanding process which, at times, contains the enthusiasm for implementing e-procurement [14]

The public agency is limited in its ability to insure that the internal structures of suppliers fits within the broader context of the rigorous ethical expectations of the public sector. Digital procurement platforms do not exist in a vacuum. They need supportive administrative constructs and technological systems. The benefits of any of the e-procurement tools will be forgone in case they are not provided with compatible support structures. It is not uncommon for agencies to report underwhelming results of e-procurement functionality due to low levels of harmonization among systems and low compliance rates [14].

Implementation of e-procurement initiatives has turned out to be much more problematic and challenging than expected. Research has shown that implementing e-procurement will not automatically lead to higher levels of efficiency or contract and system compliance. Moreover, given the relative short history of e-procurement initiatives in the public sector, reliable performance and outcome measurements have yet to be developed — thus, practitioners have to learn “on the fly.” In an attempt to address some of these concerns a “common procurement vocabulary” is vital to the ultimate success of e-procurement in achieving increased structural effectiveness through integrating procurement systems across jurisdictions [6].

The direct and transformative benefits of digitalizing public procurement are highly dependent on scale-driven effects from compatible and interconnected platforms. Given that e-procurement’s largest financial gains might be associated with decreasing internal administrative costs, scholars have suggested the need for multi-organizational implementation in order to maximize possible benefits [12].

The role of the procurement professional has evolved from a transactional to a more strategic role that can directly impact the bottom line of any organization. As an end-to-end business solution, e-procurement requires a multi-functional team with members who can [15]:

- Understand public procurement policies and practices
- Benchmark and re-engineer business processes
- Build and maintain relationships with suppliers, buyers and other stakeholders
- Understand the business requirements and the technical capabilities
- Coordinate change management
- Develop training programs.

Today’s purchasing organizations have the challenge of attracting and retaining staff with the necessary skills. Ongoing professional development for procurement personnel is also lacking. Developing and implementing an e-procurement system can be difficult and complex. An effective and efficient system incorporates appropriate tools and procedures that support technical, business and work practice requirements. It also integrates with buyer agency systems (like FMIS / ERP) and supplier systems. This integration will ensure all participants have access to the data required to complete the transaction. The diverse technical requirements of different agencies were underestimated, and technical delays eroded the value proposition to those buyers. The technology used in public e-procurement systems needs to be aligned with industry standards. This can be difficult with the lack of agreed
standards in the industry. The lack of standards and evolving classification systems around catalogues, suppliers and cost codes created difficulties in achieving interoperability across and within government [15].

The interoperability of systems and standards is an ongoing challenge facing all e-procurement systems. Managing this integration is difficult without technical standards, specifically in the area of data format. It is important to involve all appropriate stakeholders including public agencies, the software industry, private companies as well as national and international institutions.

In addition to inter-agency cooperation, cooperation between government agencies and technology service providers is crucial when implementing systems. Collaboration between buyers, suppliers and support staff is equally important, and users should be approached in a coordinated manner to understand how they may shape the system for their own purposes. E-procurement is also a strategic decision, and therefore, a good business design is vital. Succinctly, e-procurement is not a technical solution, but an end-to-end business solution. Other factors for success include: • effective procurement policy and practice • strategies that enable buyers and suppliers to adopt and use the e-procurement system • effective communication program that communicates the value of e-procurement to all stakeholders • well-devised change management program to integrate these diverse parts. Overall, there are many opportunities for advancement within public procurement [15].

Information and communication technologies do not generate efficiency by themselves. To be successful, several organizational strengths (education and expertise, discipline, process effectiveness, technical infrastructure) must complement them. The adoption and continued use of e-procurement needs to be proactively managed, communicated and fostered. Change management needs to anticipate and manage the psychological, cultural and technological resistance [18].

3.4 Process Adaption in e-procurement for success

E-procurement BPR necessitates several modifications in the day to day functions of procurement and need to overcome the resistance to change exerted by different stakeholders to switch over. Unless these new processes are adapted quickly, there is not much scope in getting the fruitful benefits of e-procurement.

Supply managers and other internal stakeholders drive user adoption and system compliance through significant change management efforts and ongoing education of end users. At some leading enterprises, supply executives become highly active internal marketers of e-procurement systems. Suppliers are involved early in e-procurement initiatives and play an active role in process refinement and change management efforts. • Suppliers are enabled for e-procurement technology using a combination of supplier enablement approaches. Supplier enablement has held back widespread use of e-procurement technology for years, but leading enterprises have overcome the supplier enablement challenge.

Aberdeen’s group while analyzing the best practices in e-procurement identified that the keys to success of e-procurement include the following [19].

- Early process reengineering. Best performing enterprises examined and “fixed” business processes before applying automated solutions. Slapping an e-procurement solution on an inefficient process will not fix that process.
- Strong focus on user adoption. End users will resist change, especially a change that may remove some of their buying power and prevent them from doing business with their “pet” suppliers (which usually are not best-performing or lowest-price suppliers).
- Involvement of all affected stakeholders in system implementation. Getting input from all internal groups and all affected suppliers typically speeds system acceptance and minimizes implementation problems.
- Examine and “fix” existing business processes before automating them. Ensure that process development efforts are accepted by all stakeholders. Selection and deployment of technol Best Practices in E-Procurement
- System implementation can be accelerated dramatically if a company conducts an objective and critical evaluation of existing business processes, and reengineers processes appropriately before the system is extended to end users. This approach also reduces the need for customizing solutions and lowers total cost of ownership (TCO).
4. BPR process mapping of Procurement As is process with to be process

The procurement function in IR passes through different processes from creation of a demand for an item to consuming the same after procurement by the end user. In order to understand for re-engineering it is necessary to map the ‘as-is’ processes. The following table reflects the sequence of processes by each stakeholder of procurement.

### Manual Processes Sequence of IR PP function from the year 1965

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Activity for the PP</th>
<th>Activity agency</th>
<th>Purpose of the Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Demand forecast</td>
<td>Advance intimation</td>
<td>Mainframe computer centre</td>
</tr>
<tr>
<td>2</td>
<td>Updation of advance intimation &amp; return</td>
<td>Warehouse Manager</td>
<td>Advance intimation corrected manually is returned back one month in advance to mainframe</td>
</tr>
<tr>
<td>3</td>
<td>Generation of Demand Forecast</td>
<td>Mainframe computer centre</td>
<td>To assess the quantity requirement for the next 18 to 24 months based on the forecast</td>
</tr>
<tr>
<td>4</td>
<td>Collection of the Forecast and updation</td>
<td>Warehouse Manager</td>
<td>Again updation takes place based on the latest developments, material budget projection,</td>
</tr>
<tr>
<td>5</td>
<td>Submission of forecast to PP office</td>
<td>Warehouse manager</td>
<td>Consolidation of all user points demands for initiating procurement action by PP office</td>
</tr>
<tr>
<td>6</td>
<td>Demand Finalization and Budget provision</td>
<td>PP office</td>
<td>The total estimated demand for the item is sent to the Finance Manager</td>
</tr>
<tr>
<td>7</td>
<td>Sanctioned quantity advice to users</td>
<td>PP office</td>
<td>Communication of the quantity decided to be procured for objection or review if any.</td>
</tr>
<tr>
<td>8</td>
<td>Initiation and processing of Procurement actions</td>
<td>PP office</td>
<td>Deciding the vendor panel for sourcing, description/specification change, formulation of</td>
</tr>
<tr>
<td>9</td>
<td>Tender Finalization</td>
<td>PP office in collaboration with</td>
<td>Commercial and technical evaluation of bids, quantity reviews, tender committees</td>
</tr>
<tr>
<td>10</td>
<td>Post contract management</td>
<td>PP office in collaboration with</td>
<td>deliberations, acceptance of bids, placement of PO after budget clearance &amp; negotiations</td>
</tr>
<tr>
<td>11</td>
<td>Monthly transaction data updation</td>
<td>Mainframe computer</td>
<td>After release of the PO manually, copies sent to mainframe and fed in the computer.</td>
</tr>
</tbody>
</table>

Apart from the monthly updates are fed manually in the Mainframe electronic data processing centre by collecting the various papers and documents generated at PP office and warehouse, the data centre also runs specified accounting programs every month and generates various management statements, reports, outputs etc so that the status till the previous month is known to all the stakeholders. All information available in the PP office and elsewhere will be based on previous month’s updated data in the mainframe computer.

4.1 BPR executed in the to be process

In the procurement process cycle that was in place earlier since five decades, in the ‘to be process’ that warranted in the e-procurement environment in each stage is discussed in the following sections and tables.
Demand Forecast Planning

Table 2

<table>
<thead>
<tr>
<th>Process</th>
<th>Executed by</th>
<th>Re-Engineered Process</th>
<th>Executed by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixing of Estimate due date distribution</td>
<td>PP office</td>
<td>Necessity based daily items picking for review from databases.</td>
<td>Automatically by Computer system</td>
</tr>
<tr>
<td>Advance intimation</td>
<td>EDP Centre</td>
<td>Obliterated</td>
<td>Obliterated</td>
</tr>
<tr>
<td>Review and validate pending estimates and contracts</td>
<td>Warehouse Manager</td>
<td>Done only for the items picked above and flashed in the dashboard of the warehouse manager computer</td>
<td>Warehouse Manager</td>
</tr>
<tr>
<td>Updation in EDP</td>
<td>EDP Centre</td>
<td>Obliterated</td>
<td>Obliterated</td>
</tr>
<tr>
<td>Generation of demand</td>
<td>EDP Centre</td>
<td>Generated based on priorities</td>
<td>Computer System</td>
</tr>
</tbody>
</table>

To avoid back and forth paper and information flows and updations as shown in the old system mapping table 2, instead of printing the hard copies of the advance intimation in the mainframe/server for the batch of items due for procurement after two months, a soft copy of the data is accessible through customized menu driven program for user point to take a print out (if required) and update the discrepancies if any noticed online on real time basis. The mainframe computer is isolated from the PP networks except running the monthly programs and generation of management reports for progress monitoring and records.

Elimination of hardcopy print outs in the mainframe/central server, sending it to the satellite user points spread across the national networks, manual updating by the users, re-submission back to the server, manual feeding and its errors etc address the problems of back and forth paper flow, human errors, delays etc cutting the time required arriving the forecast from three months to 15 days.

Demand Forecast generation

Table 3

<table>
<thead>
<tr>
<th>Process</th>
<th>Executed by</th>
<th>Re-Engineered Process</th>
<th>Executed by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimation of Quantity by Depot</td>
<td>Warehouse Manager</td>
<td>System formulas for each type of item decides the quantities for review</td>
<td>Computer System</td>
</tr>
<tr>
<td>Consumption trend analysis</td>
<td>Warehouse Manager</td>
<td>System scientifically calculates based on weightages, safety stock required</td>
<td>Computer System</td>
</tr>
<tr>
<td>Budget Matching</td>
<td>Warehouse Manager</td>
<td>Balancing more fund for extra demands by cutting lesser demands</td>
<td>Computer System</td>
</tr>
<tr>
<td>Calculate quantity required for the year</td>
<td>Warehouse Manager</td>
<td>Arrived based on ABC category, lead-time, safety levels, risks</td>
<td>Computer System</td>
</tr>
<tr>
<td>Forwarding the demand for vetting</td>
<td>Warehouse Manager</td>
<td>Send online – information exchange</td>
<td>Computer System</td>
</tr>
<tr>
<td>Finance vetting of demand</td>
<td>Finance Manager</td>
<td>Online verification and vetting clearance and returning back</td>
<td>Finance Manager</td>
</tr>
<tr>
<td>Transmit vetted demand to procure</td>
<td>Warehouse Manager</td>
<td>Submitted online through digital signing</td>
<td>Warehouse manager</td>
</tr>
</tbody>
</table>

The demand forecast generation processes are exhibited in table 3. The finalized forecast in the server is placed online for viewing by the user’s warehouse managers, who consults, checks the budgets, reconciles the planned demand for the ensuing year in consultation with the end users of the item, fills any gaps or corrects errors that may be found in the recoupment proposals generated. The controlling officer(of several end user and sub-users) who decides the total requirements required for the ensuing period are also provided with all the details of consumption of their users, so that a comparison is made for the quantity projected during the earlier procurement cycle and actual consumption of the item. After analyzing the reason it is also possible to revise the requirement for next cycle with necessary justification for the revised budget demand from the Finance manager. In the earlier manual system this was not possible and it warranted getting cumbersome process details down the line to analyze the realistic demand of each item that led to delays, process duplications, voluminous paper work etc.

The updated recoupment forecast is sent thereafter online to the Finance manager in case it exceeds certain value threshold limits in terms of value of procurement, quantity to be procured etc for exercising budget control. Small value items below the threshold value are directly sent to the PP officer for procurement. After finance vetting of the proposed demand for procurement with modification if any the warehouse manager complies with the observation of the Finance manager and forwards it online to the Procurement manager.
The procurement planning in the PP office is depicted in Table 4. Instead of manual calculations to arrive the demanded quantity for procurement, the Decision Supporting Software systems in the computer automatically calculates based on the previous trend of consumption, lead-time involved in procurement based on previous history of lead times involved in contract finalization, risks such as supply failure, stock out situations, safety/buffer stocks required for each nature of the item. For this ABC categorization based on annual usage value, safety/vital/essential/desirable items etc. This entire process eliminates paper work duplication, enhances the visibility and traceability of each case showing pending status and its monitoring. In comparisons to the manual old process taking two month time this work gets completed within a fortnight cutting across delays.

The procurement office is divided into different functional sections to deal with different items, such as Electrical, Mechanical, consumables etc, and the demand sheet from the Depot (warehouse) is received in the relevant procurement section. For easy identification each item carries an eight digit Priced Ledger Number (P.L.Number). The procurement section demand clerk connects with the already available PP office demand copy and makes out a file and feed the same in the computer, which assigns a demand number for the requirement. The demand number is noted on the sheet. A position slip of the item is also generated in the computer which reflects the developments happened for the item after generation of the demands to that date. The position slip also contains procurement history of the item.

Demand quantity Calculation: - Linking the information provided by the Depot and the status of pending dues and its latest developments for the item the quantity to be procured is arrived upto to the end of the contract period. Based on the value of the requirement the Demand clerk through the office superintendent of the section submits to the concerned procurement manager. The demand quantity is approved by different authorities based on the delegated values.

Description/Specifications Updates: - The demand clerk handover the file with the approved demand to the tender clerk for initiating the tender process. Before tender, whether any revision of the description is verified with the consumer after the depot submitted demand and the required number of Drawing and specification copies are mobilized for the tendering

<table>
<thead>
<tr>
<th>Priority processes</th>
<th>Table 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Status of items at the start of day in the PP Office</strong></td>
<td><strong>For stock out items Priority #</strong></td>
</tr>
<tr>
<td>Items without any PO dues at all</td>
<td>1</td>
</tr>
<tr>
<td>With uncovered dues i.e. no PO available but tender under finalisation</td>
<td>2</td>
</tr>
<tr>
<td>Live PO with valid delivery period exists</td>
<td>3</td>
</tr>
<tr>
<td>PO with Valid delivery period available</td>
<td>4</td>
</tr>
</tbody>
</table>
The normal course of action by procurement office in line with the old system will be to consolidate all user demand and clubbing to arrive the quantity to be procured for that item for the next year. As this is item specific, fixed period review every year, irrespective of whether stock available or otherwise, a review is conducted by taking print outs, which wastes time and resources. This methodology doesn’t facilitate to take cognizance of the other items which may require review due to precarious stock situation as result of fluctuating demands, rejections, and trade failure against the last PO etc. With a view to overcome this problem and to place the PP functions on priority basis the following Table 5 process priority is assigned for the day to day functions of PP office.

By adoption of the above process of monthly review is obliterated and instead the above priority wise processes are in the daily schedule work of the PP office and ware house manager. Since identifying the above priorities manually is a tedious process due to dynamic material inflow and outflows at the user points, the ICT tools in the MMIS software brings the above priority work schedules to the PP manager on daily basis. As the very purpose of the procurement manager is to support the agency operation by ensuring availability of materials, the above become first priority on every day to address the stock out situation problems. After focusing attention and taking necessary action for the above the PP manager can take up the other regular work. The priority also signals the corrective/remedial actions to be taken at the user points. This also reflect prospect of regular availability of materials for operation, maintenance and production in the ensuing days facilitating the PP office top management to initiate alternate emergent action to improve the material availability wherever warranted.

4.2 Re-engineered Re-order points

Once a demand hits the PP office server online, on real time basis the system activates the review not only for the items for which demand has been received for the day, but also for the demand that has to be procured when quantity reaches below re-order level. In the conventional supply chain the re-order points are arrived when the stock reaches below certain level. This is based on lead time assumptions for each item. But in a public procurement process wherein creation of competition is the watch word by ensuring public procurement ethics, the lead time changes from time to time, item to item due several market conditions such as the present supplier offering better delivery than previous vendor, production capacity of the vendor base, economic batch quantities, change in technology, readiness to pay higher rates for earlier delivery, supplier readiness to adjust their production schedules according to the purchase demand etc. So it is required to calculate the lead-time scientifically in cognizance of dynamic market conditions over a period. For this though the PP manager cannot evaluate the future market dynamics of the item, it is possible to make logical conclusions from the past lead time data over a period of about five years.

For approximate calculation of the lead-time requirement of the item in the next procurement cycle the following factors can help. After consumption of the item at the user points across the network that are captured online, the change in stock to a lower level triggers the system to run and filter the item that has reached the re-order point. The re-order point is through analysis of data from several databases which may be cumbersome process if done manually. Hence it was not possible during the manual process regimes. Those factors are listed below.

a) In the last five procurement cycles, what was the average time take to cover the demand with a PO
b) The average delivery materialization time taken in the last five PO i.e. time taken from release of PO to receipt and acceptance of the item in the warehouse.
c) The average time period of total period of delivery time extension given for last five years POs for arriving safety stock i.e say for instance in the last five years POs a total delivery period of extension of 15 months was given in five PO, then the safety stock required is 3month stock (15/5 months). This time includes from the date of PO to the PO cancellation date also in case a vendor fails to supply that led to cancellation of contract.
d) The overall vendor rating performance average of all the vendors who have supplied that item in the last 5 years to arrive the uncertainty risk factor of the vendors for the item. The IR adopts separate formulae for calculating vendor performance evaluation ratings that include delivery, quality and service rating of the vendor for each successful contract or defaulting. This address the difficulties in getting the item based on the quality of vendor base for the item and the risks involved in the contract failure.

If the stock available in the warehouse and live dues (through which supply may materialize) quantity reaches re-order level taking into the above factors the system signals to take next procurement cycle action on emergent basis i.e

The Quantity required for the total of Periods = [(a+b+c)/d] x (Monthly quantity required)
If the available balance (Stock + live PO quantity) is less than this total quantity the system triggers an alert to initiate procurement action for next period.

The PP office once completes the actions for that item in that day the next item are taken. The receipt of the fresh quantity in warehouse and consumption by user makes the system dynamic and real-time and priorities for each day is prompted for each procurement manager once logs on the system on first time of day. The prompts PP manager specific in the system is based on procurement value powers delegated to different procurement managers in hierarchy and also based on the group of items meant for each procurement manager. The processes involved in deciding the sources to whom bid solicitation is to be resorted to is in Table 6.

### Effective sourcing methodology in Procurement

<table>
<thead>
<tr>
<th>Manual Process</th>
<th>Executed by</th>
<th>Re-Engineered Process</th>
<th>Executed by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deciding tender mode</td>
<td>PP Manager</td>
<td>Based on value &amp; exigencies decided</td>
<td>Computer System</td>
</tr>
<tr>
<td>Floating restricted bid invitations</td>
<td>PP Office</td>
<td>e-tendering authorizing access only to decided panel of bidders</td>
<td>Computer System</td>
</tr>
<tr>
<td>Deciding the bidders panel for bidding</td>
<td>PP Manager</td>
<td>System brings all successful suppliers &amp; registered sources along with their credentials/performance</td>
<td>Computer System</td>
</tr>
<tr>
<td>Issuing printed bid bulletins to sources</td>
<td>PP office</td>
<td>E-bid bulletins are placed on weekly basis to access by registered vendors</td>
<td>Computer System</td>
</tr>
<tr>
<td>Open bid invitation draft preparation</td>
<td>PP office</td>
<td>System gathers all information and makes draft bid invitation</td>
<td>Computer System</td>
</tr>
<tr>
<td>Collect files of past procurement history</td>
<td>PP office</td>
<td>All relevant information is flashed and accessible in the system itself</td>
<td>Computer System</td>
</tr>
<tr>
<td>Call bid attention to prospective bidders</td>
<td>PP Office</td>
<td>Automatically system collects from the past contract/bid databases for email</td>
<td>Computer System</td>
</tr>
<tr>
<td>Collect sufficient drawing copies</td>
<td>PP office</td>
<td>Request send online to user Branch and softcopy uploaded for bidders</td>
<td>User Branch</td>
</tr>
<tr>
<td>Finalise description and item specification</td>
<td>User Branch</td>
<td>Online updation by users all the latest specifications of the item</td>
<td>User Branch</td>
</tr>
<tr>
<td>Bid invitation approval</td>
<td>PP Manager</td>
<td>Through Digital signature online approvals by PP manager</td>
<td>PP Manager</td>
</tr>
<tr>
<td>Draft Tender Approval</td>
<td>PP Manager</td>
<td>System generated draft is verified and approved by the PP Manager</td>
<td>PP Manager</td>
</tr>
<tr>
<td>Deciding Delivery Schedules</td>
<td>PP Office</td>
<td>System fixed delivery schedules based on leadtime and stock etc</td>
<td>Computer System</td>
</tr>
<tr>
<td>Inclusion of special conditions of contract</td>
<td>PP Manager</td>
<td>Picks from the past conditions and suggest to the PP Manager</td>
<td>Computer System</td>
</tr>
<tr>
<td>Preparing bidding Enquiries</td>
<td>PP office</td>
<td>Generated by system duly suggesting prospective vendors for bidding</td>
<td>Computer System</td>
</tr>
<tr>
<td>Typing the enquires and bid open date fix</td>
<td>PP office</td>
<td>System generates and suggests bid opening date from the calendar</td>
<td>Computer System</td>
</tr>
<tr>
<td>Posting/mailing bid invitations to vendors</td>
<td>PP office</td>
<td>Uploaded in the e-procurement site for access to the respective vendors</td>
<td>Computer System</td>
</tr>
<tr>
<td>Draft bidding documents approval</td>
<td>PP Office</td>
<td>Generated online and approved by PP Manager online</td>
<td>PP Manager</td>
</tr>
<tr>
<td>Preparation of Notice inviting bidding</td>
<td>PP office</td>
<td>Generated automatically by computer with information available</td>
<td>Computer System</td>
</tr>
<tr>
<td>Sending bid notice for publication</td>
<td>PP office</td>
<td>Send online through mail to Public relation Branch</td>
<td>Computer system</td>
</tr>
<tr>
<td>Bid notice publication in news paper</td>
<td>Public relation unit</td>
<td>Send to publication online to the respective publishers</td>
<td>Public Relations</td>
</tr>
<tr>
<td>Checking bid notice correctness</td>
<td>PP office</td>
<td>Bid notice send by publishers and checked online for corrigendum</td>
<td>PP office</td>
</tr>
<tr>
<td>Collecting publication for reference</td>
<td>PP Office</td>
<td>Forwarded by mail by publishers and kept as soft copy for future</td>
<td>PP office</td>
</tr>
<tr>
<td>Clarifying queries and protests of bidding</td>
<td>PP Manager</td>
<td>Received online to PP managers and clarified online</td>
<td>PP Manager</td>
</tr>
</tbody>
</table>

The mode of tender is decided on the basis of total value of the item to be procured either to resort to open public advertised tendering of to issue tender to the limited prospective sources. However in case if the item has to be procured from a sole single source only or the stock situation warrant for emergent tendering in a faster way than
the normal, the same is decided accordingly. Once the quantity to be procured is finalized, on seeking the MMIS system to generate a tender solicitation proposal it furnishes the following information for the item:

(i) List of all successful sources that supplied the item in the past with vendor performance rating >40%
(ii) Past sources whose vendor rating is less than 40% for the item
(iii) Other than the (i) & (ii) above, the other approved/registered sources with Railway for the item, but not supplied the item in the past, wherein their overall vendor ratings based on all other items supplied to Railway is >40%. (40% is the minimum qualifying performance rating for supplier that entitles to consider their bids)
(iv) Delivery requirements for the item based on available stock and live PO, say for instance a stock of 3 months quantity (excluding safety stock) is available in March 14, then the first installment of 3 months quantity should be deliverable in the next contract during the month of June ’14, so that before the item is exhausted, fresh quantity is sought for.
(v) If the item is out of stock or the lead-time is such that before the next supply is expected the available quantity may get exhausted, out of the total quantity of demand three months quantity can be procured through emergency purchase through limited tender or sole sourcing from the ready stock sources which is also prompted in the system.

In case of limited tenders, all sources in (i) above is included and the sources (ii) & (iii) is decided by procurement manager in a discretionary manner depending upon the nature of the item, value of procurement, sources capacity cum capability, number of sources in (i) that can be suffice to create competition, delivery requirements etc. Thereby MMIS system assists the PP manager in identifying the effective sources and decides the speed at which the item could be made available to avoid stock out situation. Once the sources and bidding mode is decided, the bidding process is managed as per Table 7.

### Bidding Process Management

<table>
<thead>
<tr>
<th>Process</th>
<th>Executed by</th>
<th>Re-Engineered Process</th>
<th>Executed by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation of copies of bid documents</td>
<td>PP Office</td>
<td>Soft copy uploaded in e-portal for downloading by the bidders</td>
<td>PP Office</td>
</tr>
<tr>
<td>Receive bid documents sale requests</td>
<td>PP office</td>
<td>Obliterated as uploaded already in e-procurement portal</td>
<td>Obliterated</td>
</tr>
<tr>
<td>Receiving payment cost of bid documents</td>
<td>PP office</td>
<td>Bidders pays online while downloading through gateways</td>
<td>e-portal</td>
</tr>
<tr>
<td>Selling bid documents and sending to bidders</td>
<td>PP Office</td>
<td>Obliterated as handled online</td>
<td>e-portal</td>
</tr>
<tr>
<td>Issuing corrigendum &amp; addendum to notice</td>
<td>PP office</td>
<td>Reviewed based on queries and posted in e-portal when required</td>
<td>e-portal</td>
</tr>
<tr>
<td>Advising corrections to bid notice</td>
<td>PP office</td>
<td>Obliterated as posted online</td>
<td>e-portal</td>
</tr>
<tr>
<td>Receiving bids from the bidders</td>
<td>PP office</td>
<td>Obliterated as received online</td>
<td>e-portal</td>
</tr>
<tr>
<td>Record keeping of the bids received</td>
<td>PP office</td>
<td>Obliterated as the system maintains</td>
<td>e-portal</td>
</tr>
</tbody>
</table>

4.3 Automated tender solicitation

In case of Limited tender invitation, once the sources are decided, when the procurement manager approves the tender online, the tender solicitation is shifted in the electronic procurement portal (IREPS) with specified due date fixing. After this a draft tender schedule is displayed on the screen for the benefit of the Procurement manager to exercise final check of all parameters of the tender. Once this is approved the page link is sent to email of the respective sources in the tender invitation panel. The supplier can log on the IREPS through his assigned password and digital signatures and can submit their offer electronically on line. Apart from email to the vendors, SMS alerts with key information of the tender are also sent to the mobile phone numbers registered for the firm through system. For this IREPS provides any vendor to get it registered for receiving such alerts and tenders online.

4.4 Innovated Bulletin tendering system

The vendors who intend to supply to Indian Railways are inducted as Registered Suppliers of the Railway for a batch of items for which they have the credentials along with capacity cum capability to supply. In the earlier manual system a monthly bulletin booklet of tenders were generated and sent to these registered suppliers. This
system of collecting subscription charges from the vendors, printing of bulletin books, sending them by post every month is in vogue for 50 years.

In the present system, the printing and sending bulletin to registered suppliers is modified by posting the e-Bulletin online in the IREPS portal, which can be accessed by the registered suppliers through their log in pass words. Besides this, the suppliers need not search for the items they are registered, as for the items they are dealing is separated and an email is generated with SMS alerts also and sent to them for participating in the bulletin tenders. This ICT tool besides eliminating the paper work and manual activities in sending the books to the vendors, has also reduced the lead time of each item’s procurement. While in the manual system as all the activities required considerable time from the date of publication of the tender enquiry, atleast 90 days time was fixed for due date, which is now reduced to 30 days as the publication of tender is quicker by simply uploading the bulletin of tender in the portal.

4.5 Open Advertised solicitation

In case of open advertised tender, the approved tender is automatically uploaded in the IREPS website with a Notice Inviting Tender (NIT) to be sent by email to the respective media for publication in the newspaper/journals etc which is compulsory in the public procurement to ensure transparency. In case of open tender, email and SMS alerts are also generated automatically to the vendors to the prospective vendors identified by the system. Once a procurement process is initiated, alerts also sent to the end users so that last minute modifications of quantity, description/specification etc if any is done online which be taken care before tender release or after tender released posting as addendum to the original tender solicitation.

<table>
<thead>
<tr>
<th>Process</th>
<th>Executed by</th>
<th>Re-Engineered Process</th>
<th>Executed by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominating tender opening officers</td>
<td>PP Authority</td>
<td>Nominated and authorized by the e-portal administrator</td>
<td>PP Authority</td>
</tr>
<tr>
<td>Seeking bid opening official Finance branch</td>
<td>PP Authority</td>
<td>Alerts send from the e-portal</td>
<td>e-portal</td>
</tr>
<tr>
<td>Collect the bid files before opening</td>
<td>PP office</td>
<td>Obliterated as all documents is available online</td>
<td>E-portal</td>
</tr>
<tr>
<td>Sealing of tender box at bidding close time</td>
<td>PP office</td>
<td>Obliterated as system locks automatically</td>
<td>e-portal</td>
</tr>
<tr>
<td>Receiving bids from the bidder by post</td>
<td>PP office</td>
<td>Obliterated as system handles online</td>
<td>E-portal</td>
</tr>
<tr>
<td>Receiving late bids by post</td>
<td>PP office</td>
<td>Obliterated as system do not allow</td>
<td>e-portal</td>
</tr>
<tr>
<td>Sealing of tender box</td>
<td>PP office</td>
<td>Obliterated as closed automatically</td>
<td>e-portal</td>
</tr>
<tr>
<td>Tender box opening</td>
<td>PP Manager</td>
<td>Opened through digital signatures</td>
<td>PP Manager</td>
</tr>
<tr>
<td>Sorting of bids</td>
<td>PP office</td>
<td>Obliterated as system picks auto</td>
<td>d-portal</td>
</tr>
<tr>
<td>Participation of bidders in bid opening</td>
<td>Bidders</td>
<td>Access online by bidders after the bid opened in PP office</td>
<td>e-portal</td>
</tr>
<tr>
<td>Bids documenting opening, documenting</td>
<td>PP office</td>
<td>Obliterated as handled by e-portal</td>
<td>e-portal</td>
</tr>
<tr>
<td>Signing and reading of bids to bidders</td>
<td>PP office</td>
<td>Obliterated as bidders view online</td>
<td>e-portal</td>
</tr>
<tr>
<td>Serially numbering the bids</td>
<td>PP office</td>
<td>Bid id numbers are generated by system in e-portal</td>
<td>e-portal</td>
</tr>
<tr>
<td>Documenting the total bids and tallying daily</td>
<td>PP office</td>
<td>Obliterated. Generated by system</td>
<td>e-portal</td>
</tr>
<tr>
<td>Filing bids in the procurement files</td>
<td>PP office</td>
<td>Only commercial tabulation is generated and signed</td>
<td>PP office</td>
</tr>
<tr>
<td>Calculating tender value and authority</td>
<td>PP office</td>
<td>Obliterated System gives the authority to be dealt</td>
<td>E-portal</td>
</tr>
<tr>
<td>Send bids to PP Authority</td>
<td>PP office</td>
<td>Bids are send to the relevant authority by system automatically</td>
<td>e-portal</td>
</tr>
<tr>
<td>Account of Bid security and cost</td>
<td>PP office</td>
<td>Through payment gate-ways in the e-portal</td>
<td>e-portal</td>
</tr>
</tbody>
</table>

4.6 Online Protest and Clarification

After floating the tender solicitations online, in case of any clarification is required by the firms, the queries are lodged online by firm in the tender solicitation portal which in turn gets delivered to the respective
The contract officer gives the clarification at once, which is also available to all the prospective sources for tender. In case of delays contract officer also considers a brief postponing of the tender due date in order or give reasonable time to the suppliers to quote or revise their offer after the postponement of tender due date. The process of bid opening is in Table 8. On the tender opening date and time the nominated person though his digital signature key and encryption certificate key opens the tender. Once the tender is opened the entire offer details are delivered to the respective PP manager online. Simultaneously the comparative tabulation statement of the tender is emailed to all the sources who have participated in the tender, so that they are apprised in a transparent manner about their inter-se commercial competitive position in the tender. The next stage is evaluation of bids to consider contract award. The processes are mapped in Table 9.

Bid Evaluation process through ICT

<table>
<thead>
<tr>
<th>Process</th>
<th>Executed by</th>
<th>Re-Engineered Process</th>
<th>Executed by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiving Tender file by PP Authority</td>
<td>PP Authority</td>
<td>Received in inbox of PP authority system dashboard</td>
<td>e-portal</td>
</tr>
<tr>
<td>Checking all offers for correctness</td>
<td>PP Authority</td>
<td>Obliterated as system verified and generated</td>
<td>e-portal</td>
</tr>
<tr>
<td>Preparation of Tabulation statement</td>
<td>PP office</td>
<td>Obliterated as system generates</td>
<td>e-portal</td>
</tr>
<tr>
<td>Tabulation verification by PP Authority</td>
<td>PP Authority</td>
<td>Obliterated</td>
<td>e-portal</td>
</tr>
<tr>
<td>Sending to finance and vetting by finance</td>
<td>PP office</td>
<td>Obliterated</td>
<td>e-portal</td>
</tr>
<tr>
<td>Finance observation compliance</td>
<td>PP Authority</td>
<td>Obliterated</td>
<td>e-portal</td>
</tr>
<tr>
<td>Referring to technical evaluation</td>
<td>PP Authority</td>
<td>Referred online</td>
<td>e-portal</td>
</tr>
<tr>
<td>Receiving technical evaluation</td>
<td>PP authority</td>
<td>Received online</td>
<td>e-portal</td>
</tr>
<tr>
<td>Circulating tender file to committee members</td>
<td>PP Authority</td>
<td>Through messages and mails</td>
<td>PP Authority</td>
</tr>
<tr>
<td>Preparing evaluation brief for discussion</td>
<td>PP Authority</td>
<td>Computer generated and edited</td>
<td>e-portal</td>
</tr>
<tr>
<td>Fixing of tender committee meeting date</td>
<td>PP Authority</td>
<td>Through mutual acceptance through messages and mails</td>
<td>PP Authority</td>
</tr>
<tr>
<td>Finalization of tender committee minutes</td>
<td>Tender Committee</td>
<td>Through online in the system</td>
<td>Tender Committee</td>
</tr>
<tr>
<td>Signing of tender committee minutes</td>
<td>Tender Committee</td>
<td>Signed by members digitally</td>
<td>Tender Committee</td>
</tr>
</tbody>
</table>

The contracting officer once opens the delivered bids for that day it displays the entire history of the item with details such as

a) Comparative competitive inter-se tabulation of the offers
b) Deviations/counter offers given by the sources
c) History of the item, where it is used, who are the end users, where & when required, last purchase details, previous suppliers for the item with their performance, previous year consumption trends, pending orders for the item, change in market of its raw material inputs etc

On scrutiny of all the above information which are retrieved and displayed from different databases of the server, the procurement manager evaluates and decides after ascertaining/satisfying the rate reasonability of the source on which the contract has to be awarded. On finalization and clicking the accept tab the entire draft PO is displayed on the screen to the manager to peruse the entire terms and conditions, to carry out correction if any warranted by the contract manager after which signs the PO digitally through their digital signature.

Once the PO is signed the soft copy of letter of acceptance (LOA) is sent and a draft PO is sent online to the Finance Manager to vet the PO (in case purchase value exceeds the threshold value) for budgetary provisions and Finance branch sends back the vetted PO to the contract officer, who on authorization from the finance manager releases the PO. The released PO is automatically sent online to the supplier. Hard copies are also taken and sent to the respective stakeholder of the PO for record and meet statutory compliances. In addition to this, SMS alerts are also sent to the supplier.
4.7. Process in the Open tender solicitations

After opening of the tender, the bids are delivered to the respective contract manager online. In open tenders instead a contract officer decides the tender, a committee comprising a technical engineer from the user branch, finance manager along with the contract officer has to meet, deliberate and submits the recommendation to the tender accepting authority. For this the online information exchange is facilitated online to speed up early finalization of the committee recommendations. The contract award finalization process in Table 10.

Before the committee meets, a technical evaluation of the offers has to be done by the technical member of the tender committee. The Material Manager who is also the convener of the tender committee first sends the bids received by him after opening the tender to the technical member of the committee online. The technical member furnishes the technical recommendation and the points he finds it relevant to be discussed during the meeting and sends it to the Finance member of the tender committee. The finance officer also peruses the tender after which on a nominated day the committee meets and decides the rationale for recommendation and makes the recommendation in the custom screen. Thereafter the tender committee recommendation minutes are signed digitally by the committee members and sent to the tender accepting authority online electronically. The tender accepting authority peruses the committee recommendations and gives his orders regarding acceptance/rejection/modification of the committee recommendation and sends it back to the material manager. For the tender accepting authority also all the relevant details as available in the limited tender for finalization will be available online.

<table>
<thead>
<tr>
<th>Process</th>
<th>Executed by</th>
<th>Re-Engineered Process</th>
<th>Executed by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submit committee minutes</td>
<td>PP Authority</td>
<td>Send online through alert mails</td>
<td>PP Authority</td>
</tr>
<tr>
<td>Acceptance order of Contract Authority</td>
<td>Contracting Authority</td>
<td>Gives acceptance orders online signs digitally and return it back</td>
<td>Contracting Authority</td>
</tr>
<tr>
<td>Issuing Letter of Acceptance (LOA)</td>
<td>PP Authority</td>
<td>Send online through mail and SMS alerts to the successful bidder</td>
<td>PP Authority</td>
</tr>
<tr>
<td>Receiving bid security from the contractor</td>
<td>PP Authority</td>
<td>Online mail and payment through electronic fund transfers</td>
<td>e-portal</td>
</tr>
<tr>
<td>Preparation of Draft purchase order</td>
<td>PP Authority</td>
<td>Generated by the e-portal system and send to Finance branch</td>
<td>e-portal</td>
</tr>
<tr>
<td>Checking and signing of draft Purchase order</td>
<td>PP Authority</td>
<td>Checked online and forwarded to Finance branch</td>
<td>PP Authority</td>
</tr>
<tr>
<td>Vetting and booking funds liability</td>
<td>Finance Branch</td>
<td>Online vetting and automatic funds booking on the budget allocation</td>
<td>Finance Branch</td>
</tr>
<tr>
<td>Receiving vetted PO remit</td>
<td>PP Office</td>
<td>Obliterated as e-portal handles online</td>
<td>e-portal</td>
</tr>
<tr>
<td>Receiving bid security remit</td>
<td>PP Office</td>
<td>Approved online and payment authorizes for EFT</td>
<td>PP authority</td>
</tr>
<tr>
<td>Assigning purchase order number</td>
<td>PP office</td>
<td>System generated Purchase order number</td>
<td>e-portal</td>
</tr>
<tr>
<td>Signing of PO</td>
<td>PP Authority</td>
<td>Signed digitally by PP Authority</td>
<td>PP Authority</td>
</tr>
<tr>
<td>Distributing the contract by post to all</td>
<td>PP Office</td>
<td>Done by the system through mails and SMS alerts</td>
<td>e-portal</td>
</tr>
<tr>
<td>Posting of contract</td>
<td>PP office</td>
<td>Obliterated as being sent by mail</td>
<td>e-portal</td>
</tr>
<tr>
<td>Returning bid security to unsuccessful bidders</td>
<td>PP Office</td>
<td>Approved online and payment authorizes for EFT</td>
<td>PP authority</td>
</tr>
</tbody>
</table>

On getting acceptance order of the tender accepting authority (TAA), the material manager, makes a draft PO and sends a Letter of acceptance to the accepted vendor. Simultaneously the draft PO is send to Finance manager for vetting and budget provision and returned back to the material manager. The material manager signs the PO digitally and sent to the supplies as like in limited tender process.

4.8 Post Contract Management

For contract management, a separate module is functioning in the computer system. The ‘as is process and the reengineered process is Table 11.

Once the PO is released, at regular intervals the contract management is to monitored with requisite actions so that the status of contract is visible and supply status is traceable.

a) Once the supplier gets the PO and accepts the PO online it becomes a live binding contract.
b) The supplier is given access to post information about the dispatch/supply details online.
c) Where such of supply details are not posted by the suppliers before 15 days of the delivery due date due email and sms alerts are sent to the supplier and the warehouse manager to update the supply status of the item online.
d) In case of no delivery status on expiry of due delivery date, the penal conditions of contract is invoked by the contracting officer and a notice is served to the defaulting firm to explain as otherwise resorting to procure the item elsewhere at the defaulter risk and cost.
e) In case on delivery failure the contract is cancelled and cancellation advice sent to the defaulter online and alternate procurement action is resorted to the item as per terms of the contract.
f) In case the firm seeks for delivery period extension, the firm registers and asks the same online with the contracting officers. The contracting officer if considers the request may give extensions online.
g) The firm as well as the contracting officer can exchange letters and clarification about the contract online.

<table>
<thead>
<tr>
<th>Process</th>
<th>Executed by</th>
<th>Re-Engineered Process</th>
<th>Executed by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receipt of contract copy by warehouse</td>
<td>Warehouse</td>
<td>Online digitally signed PO is printed for record</td>
<td>Warehouse and</td>
</tr>
<tr>
<td>Verifying contract with demand sent</td>
<td>Warehouse</td>
<td>Checked online for further action if any</td>
<td>Warehouse and</td>
</tr>
<tr>
<td>Referring to PP office</td>
<td>Warehouse</td>
<td>Through mails and SMS alerts in the e-portal</td>
<td>Warehouse</td>
</tr>
<tr>
<td>Review and follow up with the contractor</td>
<td>Warehouse</td>
<td>Mails and SMS are sent to the Contractor</td>
<td>Warehouse and</td>
</tr>
<tr>
<td>Contract modification request from supplier</td>
<td>Contractor</td>
<td>Through online requests and complaints handling page in e-portal</td>
<td>Contractor and</td>
</tr>
<tr>
<td>Issue of contract modification</td>
<td>FP Authority</td>
<td>Issued online and mails/SMS alerts are sent to all stakeholder.</td>
<td>FP Authority and e-portal</td>
</tr>
<tr>
<td>Receiving Road permit request from vendor</td>
<td>Warehouse manager</td>
<td>Through mails, generated online and sent by mail</td>
<td>Warehouse</td>
</tr>
<tr>
<td>Supplier call for material inspections</td>
<td>Contractor</td>
<td>Online with the Inspecting Authority web portal</td>
<td>Contractor</td>
</tr>
<tr>
<td>Issue of inspection certificate after tests</td>
<td>Inspecting Authority</td>
<td>Updated in their portal and inspection certificates sent to all</td>
<td>Inspecting</td>
</tr>
</tbody>
</table>

When the contractor supplies the item to consignee, the item is received in the warehouse, where it is verified for its quantity and quality and accounted in the books of warehouse. The processes is in Table 12

### Supplies Receipt and Acceptance

<table>
<thead>
<tr>
<th>Process</th>
<th>Executed by</th>
<th>Re-Engineered Process</th>
<th>Executed by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Despatch of stores by contractor</td>
<td>Contractor</td>
<td>Physical activity by the supplier</td>
<td>Contractor</td>
</tr>
<tr>
<td>Sending of dispatch documents</td>
<td>Contractor</td>
<td>Negotiable documents sent physically and posted in mail</td>
<td>Contractor and</td>
</tr>
<tr>
<td>Receiving dispatch documents</td>
<td>Warehouse</td>
<td>Scanned copies received online</td>
<td>e-portal</td>
</tr>
<tr>
<td>Receiving supplies, checking for quality and quantity</td>
<td>Warehouse</td>
<td>Physical activity done as is</td>
<td>Warehouse</td>
</tr>
<tr>
<td>Certifying documents for payment</td>
<td>Warehouse</td>
<td>Entered in the portal and invoices are certified for payment</td>
<td>Warehouse and</td>
</tr>
<tr>
<td>Acceptance and accountal by consignee</td>
<td>Warehouse Manager</td>
<td>Acceptance entered and accountal online</td>
<td>Warehouse and</td>
</tr>
<tr>
<td>Submission of payment documents</td>
<td>Contractor</td>
<td>Submits physically and sends online</td>
<td>Contractor</td>
</tr>
<tr>
<td>Receiving bills by Accounts branch</td>
<td>Finance manager</td>
<td>Received both physically and online submissions</td>
<td>Finance Manager</td>
</tr>
<tr>
<td>Bills scrutiny and verification</td>
<td>Finance Manager</td>
<td>Carried out online</td>
<td>Finance Manager</td>
</tr>
<tr>
<td>Passing of bills</td>
<td>Finance Manager</td>
<td>Carried out online</td>
<td>Finance Manager</td>
</tr>
<tr>
<td>Preparation of Bankers Cheques</td>
<td>Finance Manager</td>
<td>Obiterated</td>
<td>e-portal</td>
</tr>
<tr>
<td>Sending Cheques to contractor</td>
<td>Finance Branch</td>
<td>Obiliated</td>
<td>e-portal</td>
</tr>
<tr>
<td>Remitting in bank for clearance</td>
<td>Contractor</td>
<td>Obiliated</td>
<td>e-portal</td>
</tr>
<tr>
<td>Realizing payments</td>
<td>Contractor</td>
<td>Receiving through EFT for bills</td>
<td>e-portal</td>
</tr>
</tbody>
</table>
There is certain compliance actions have to be rendered by different stakeholders after completion of the contract to close and maintain its records. The processes are as per Table 13.

<table>
<thead>
<tr>
<th>Process</th>
<th>Executed by</th>
<th>Re-Engineered Process</th>
<th>Executed by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive Performance Guaranty</td>
<td>PP Office</td>
<td>Physical activity</td>
<td>PP office</td>
</tr>
<tr>
<td>Performance assessment of supplier</td>
<td>PP office</td>
<td>System generated</td>
<td>e-portal</td>
</tr>
<tr>
<td>Warranty claims and rejections</td>
<td>Warehouse</td>
<td>Received and dealt if required</td>
<td>Warehouse</td>
</tr>
<tr>
<td>Refund of bid security</td>
<td>PP Office</td>
<td>Physically done</td>
<td>PP office</td>
</tr>
<tr>
<td>Performance Guarantee return</td>
<td>Finance Manager</td>
<td>Returned after Warranty/ Guarantee period</td>
<td>Finance Manager</td>
</tr>
<tr>
<td>Contract closure</td>
<td>PP office</td>
<td>System alerts and archived</td>
<td>e-portal</td>
</tr>
<tr>
<td>Safe custody of contract file</td>
<td>PP office</td>
<td>File with basic and important documents is kept on safe custody</td>
<td>PP office</td>
</tr>
</tbody>
</table>

### 4.8. Performance and Progress monitoring of PP functions

#### 4.8.1. Online crisis management meeting list:-

In order to discuss the availability of items, trade failures, alternate emergent action to speed up certain functions, regular weekly and monthly progress monitoring meetings are convened by PP office with controlling officers of several end users, divisions, warehouse managers etc. In the earlier manual system a list of items were sent to all the authorities who are to attend such meeting to collect all the relevant information required for each item to discuss. In the present system, through the customized menu, once the meeting list of items are decided the entire details will be displayed online by retrieving the required information from several databases for inputs or analysis by the persons who will attend the meeting. On the meeting day, the customized format is displayed in the conference hall through multimedia projector directly linking to the server. This apart from eliminating the paper work of taking several print outs, also make the information real-time due change in positions captured online from the field units. The decision supporting system is also analyze the data and proposes the agenda crisis items to all.

#### 4.8.2 Management reports

Unlike in the earlier system wherein the mainframe computer every month has generated some management reports in predefined formats, in the current MMIS any information can be generated according to user wish and requirement according different purposes through customized menus and data retrieval methods. This also facilitates anytime review on real-time basis instead of seeing the printouts whose position is one month old generated in mainframe computer in earlier system. It is also possible to know the Performance indices for the month, Progress monitoring and Workload pending at each level.

### 5 Conclusions

This paper discussed the issues in e-procurement and how in public supply like IR e-procurement can be benefitted through business process re-engineering of each of the procurement activity within the policy and rules framework.

In the old PP systems in the absence of priorities the PP manager in most time was doing crisis management in making available the items that become out of stock. Whereas in the present system it is possible for the PP manager and the warehouse manager to know at once the item reaches re-order point based on several factors. This facilitates preventing actions in the PP office for all the time availability of items. Further as most day to day functions are carried out in the MMIS and e-procurement portals, the TCO of the PP is reduced besides ICT tools improving the effectiveness of the PP functional framework.

Even though it is possible to have better than the proposed to be process, to comply with the PP rules, policies and ethics the process improvement is attempted within the available resources and implementation scope.
as otherwise it is possible to obliterate the entire process for more effectiveness with the following measure which could be done in the future when government brings new legislations to improve efficiencies of PP further.

From annual P-model to daily review models: - The present system was developed 40 years back when no computers were available in procurement office. Once the entire process in online no annual reviews is required and it is possible to do procurement work on daily priority basis based on the categories and urgency of requirement. At present there will be items without contracts, but the office will be placing another contract for the requirement of next year when the same item is in stock. This is against priority working without paying immediate attention to an item which is stock-out. The followed model is proposed to do priority work.

As most of the key personnel are provided with Digital signatures, online working, and authorization/approvals is not a problem. At present in the as is process every month the monitoring is done by taking print-outs/management reports of all the cases pending, which is time consuming process. In the re-engineered process these metrics and performance parameters are proposed to be captured online and reflected in the map. The main problem in the as is process is visibility of each case and its traceability. Another problem is at each stage how many cases are pending could not found real time. To overcome this in the to be process two metrics of KPI, viz, (a) how much work has been done at each process (b) how much is pending with the stage and how much is not done within the target is captured. This will facilitate to analyze the process performance to identify process bottlenecks, problems etc for addressing the same with improvement in the processes now and then. The re-engineered processes will have benefits as below, with simplification, automation, integration & re-engineered processes

- Forecast & Demand decision data is kept online (no printouts) & updated online duly transferring to Mainframe via intranet for demand finalisation.
- LT/BT through e-tender, eliminating paper work, online offers, manipulations in tenders avoided
- E-mail/sms alerts to every stakeholder with pop-up screens while log-in every time.
- Online retrieval of vendor database & performance details of Registered sources for tendering decisions.
- Integration of Stores & Mainframe server via intranet for real-time information visibility across organization
- Online description/Requirement revision by consumer
- E-mail/SMS alert instead of Call attention advices to vendor
- Clarification for the queries answered online for the tender
- Visibility of process, its metrics measurement, performance monitoring.
- Identification of KPI for all main process to know the reasons.
- Demand to PO time will get reduced
- Manual commercial evaluation is reduced with e-tender tabulation of offers
- Visibility and performance metrics is easy to measure and monitor
- Quick tender finalization and PO release is possible due to lesser process time

From a policy perspective, it becomes readily apparent that the success of any attempt to transform government, whether in terms of governance or administration, must not only account for the idiosyncratic nature of individual environments, but must also account for all existing processes within systems and how best to transform them collectively. Technology on most occasions is simply a tool that must have a defined set of circumstances to properly achieve its potential, like a set of agreed upon criteria to implement any policy process change. In addition to recognizing the limitations of structurally unsupported technology, there is a significant amount of research in the policy implementation literature which finds that in order to avoid potential problems during implementation, political, institutional and behavioral issues must be fully assessed prior to adopting new initiatives [17].

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REFERENCES


IPPCC Conference August 2014: Public Procurement in Austere Times.

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ABSTRACT

When considering today’s topic, let us link to the conference theme of public procurement in austere times.

Procurement, whether in austere times or not, should be looking at better governance and how procurement can add value in addition to today’s difficult environment.

It is the perfect opportunity to look at how procurement can be improved. Austere times calls for the ability to manage often with less. To achieve this is the need to look at systems and procedures. This links into how Procurement operates and what is required to transform Procurement.

We certainly need procurement transformation as well as value creation. One way of doing this is to take a hard look at what is really needed (in terms of systems and procedures – the way we do things) and also procurement leaders and leadership. If we want procurement to move forward in any meaningful way, and be able to show what is possible, we need procurement leaders and leadership to create a way and means for this to happen, to see how far we can reform procurement from where it is now and create a new level or increase the value of procurement in the way we move forward. Whether we use the word ‘Reform’ or ‘Transformation’ it does not matter.

So, in the time given I would like to provide an overview but move it to the possible and look at how we might achieve the change. Once we make a start, we might surprise ourselves – we might find procurement practitioners who want to make a difference – which is what is needed in these times.

INTRODUCTION

What do we want procurement to look like? It is helpful to consider what we want the procurement picture to look like especially in austere times.

Procurement requires innovation and strong governance – and is even more important in austere times. We should be proactive and procurement has a big role here. We should be working differently and more effectively.

We need a ‘voice’ that does not currently exist. We need to speak up. There is a lack of debate about procurement reform and the need for procurement leadership and leaders. We, in effect, are doing our profession a disservice.

How can we promote leadership? I believe it is up top procurement to have the vision and to communicate that vision. In the short term, leadership might have to start with procurement practitioners being encouraged by management. The procurement staff know the processes they use, and work with management, so this is the obvious place to start. Having enlightened management helps too.

ISSUES

The following are issues that requires innovation and governance consideration especially in austere times. We should move away from ‘business as usual’ and think strategically – but also make changes that will move procurement in a better and forward direction, to consider and look at procurement reform, collaboration and innovation.

Recognise the Need – Procurement overall needs direction, vision and procurement reform. Procurement practitioners operate very much in isolation and historically do not promote procurement particularly well.
Procurement have to promote the agenda for positive procurement reform in order to find direction. Debate is essential, with the aim of finding procurement leaders who can provide leadership.

**Training is essential.** We need experienced procurement practitioners. Up to date knowledge and expertise is a must. We can no longer operate by trial and error.

**Agenda** - We need to write the agenda and promote the need for change. We need to make ourselves heard - clearly. Strategically we need to promote and look at what is needed.

**Debate** – This comes from the agenda. We need direction, discussion and input. The debate(s) need(s) to be focused and be inclusive and across business boundaries.

**Resources** – When we talk resources we are talking about (a) skill base, (b) staff numbers and (c) financial resources. Resources are necessary to ensure we can undertake and promote effective procurement.

**Consistency** – Consistency is essential in areas of training, key messages and high standards to operate, which includes effective measurements.

**Benefits** – the benefits of procurement champions – yes - champions – as well as championing procurement are:

1. Promoting procurement internally (and externally).
2. Achieving a 'Voice' that is heard.
3. Being seen in its own right.
4. Having a management procurement champion.
5. A 'voice' or seat on the Board/Management.

It should be recognised that the changes proposed can be achieved with little or no cost. Long term benefits can override any short term cost. The benefits can assist greatly in managing uncertainty.

Achieving procurement governance in its own right is essential -- along with the need to link into organisational governance. Governance assists in effective systems and procedures.

**Linking to Procurement Reform** – Procurement is in need of reform – minor and major. You can look at implementing change within your organisation. Equally, you can contribute to wider debates.

There is an urgent need for procurement to change/grow and gain a necessary 'voice'. Procurement needs to set the agenda, for procurement to debate what can be and to involve ourselves so procurement can take its place by providing effective solutions to our organisations. This assists in procurement governance and essential in austere times and implementing innovation.

As a part of this, of course, is the need for Procurement Leaders to become visible and their leadership acknowledged and used. Below are some areas for discussion and debate.

**Procurement Leadership** – We need to 'grow' and one way of doing this is to encourage leadership - on both the big stage as well as within our organisations. We need to consider the 'big stage' debates and especially as it relates to the 'how' and 'where'.

**Procurement Leaders** – Procurement badly requires procurement leaders. Debate is required about the mechanism of the process of finding and mentoring aspiring procurement staff

**Procurement Leaders and Leadership: Procurement Reform**

We should not put this reform in the 'too hard' basket. Procurement practitioners need to be able to debate the need for procurement leaders and procurement direction. We need a strong strategy - and we need it now including innovation.
At present the whole issue of procurement leaders and leadership is 'hidden' and we need to be able to open this up for discussion. We need vision, direction, ideas and flow through to the awareness of achieving ongoing debate on possible procurement reform. Awareness raising is a key part in opening the discussion of the need to identify procurement reform.

Naming Leaders: Business Leaders versus Procurement Leaders.

Why is it that we can name Business Leaders, i.e. Donald Trump, Richard Branson, Steve Jobs and others but can we easily name three Procurement Leaders?

Transformation can come about by looking at change, making a difference, looking at possibilities and being in a position to communicate to management – we need a better procurement ‘voice’ and look at working more collaboratively with suppliers.

Initiative is required especially in austere times. This can only be beneficial in ensuring governance as well as procurement transformation can occur.

What makes a Procurement Leader?

A procurement leader comes about by being passionate about procurement and also having the ability to see 'the big picture. There is the need to have the mechanics of procurement but also the ability to communicate, promote and 'walk the walk and talk the talk'.

A procurement leader provides added value to the day to day process and is able to think and act strategically. In addition, the ability to be proactive, practical and operational is important. This of course includes achieving not only 'buy in' from others but implementation of new ways.

What is needed?

It could be said that there is a need for a Procurement Leadership Academy in which we actively look for and teach leadership skills to procurement people who have the talent to progress.

We need practical practitioners and not theorists. We require people with the ability to lead implementation teams working with procurement policies and procedures. Talking is fine but we need to move past that and put theory into practice. A mix of personal/professional integrity and ethics are vital.

Personal Leadership

In the short term there is a requirement for personal leadership, i.e., for each procurement person to learn and exhibit personal leadership skills, in other words, to be a procurement leader. This needs to be encouraged and then leaders who can make a difference can emerge. There is a responsibility to provide direction within your organisation. Empowerment of procurement practitioners can assist here. We might then have empowered procurement staff and from there we can make a start to finding procurement practitioners who can provide leadership to colleagues internally and externally.

Need for Debate

How important is leadership? It is vitally important if we want debate to occur and to promote procurement change. We want to be able to have that debate ourselves. There are leaders in organisations but they do not necessarily have the knowledge we do. Procurement does not need others to dictate the agenda. We need to keep control of the topic and our destiny.

Place in Organisation Structure – It is well past time that procurement had a 'place' in organisations and appropriate visibility and impact. We need to have our own place in the organisational chart rather than being hidden under the umbrella of divisions such as 'Finance' or 'Corporate Services'. This requires debate as to where we see ourselves and how and where we can make ourselves a true 'home'.
Procurement Roles - Procurement is in dire need for consistency of roles. This area is such a mess. Debate should occur, as to how to achieve this. It is not helpful to have conflicting roles and terminology. We also badly need for procurement staff to be empowered so that they feel they are valued. Note: We need to take some responsibility ourselves to be empowered.

Looking at Procurement Rules – Debate should occur to establish the viability of rules, especially in respect of how long the procurement process takes. The long process can be off-putting to suppliers and lead to frustration. It is acknowledged that there needs to be a transparent process – but a balance should be established between transparency and timeframes.

Staff Training/Mentoring/Induction. - Procurement requires well trained staff and staff who want to be in procurement. We need to motivate, encourage and actively support staff. Procurement staff can benefit from mentoring.

Procurement is not static – therefore ongoing training is a must. Equally, mentoring should be available for those who wish to make use of it or those who have the ability to mentor.

One way to achieve promotion of training and mentoring is through an effective induction programme. I repeat: effective. Debate should occur as to what we want to achieve in these complementary and diverse areas. This is pure innovation and useful. Governance is a key area that should be debated.

All of the above can be achieved in good or bad times — and it is even more vital in bad times the ability to transform procurement and to focus on innovation is a must in these times of austerity.

'Soft Skills'

The question is: should 'soft' skills of (a) leadership, (b) communication and (c) management be a part of procurement skills? I believe so. Procurement needs leaders and leadership. These skills should be taught alongside procurement basics. In this way procurement can emerge and grow.

Changing the 'Conversation' - we need to look at how we operate - we at times over-complicate the process. We are also ignoring our contractual partners - our suppliers. Why are we doing this?

Having a conversation is essential in good and bad times as we try to achieve more with less and the need to consider governance issues must be part of that discussion.

Delivering results

We need to deliver – especially in these times. We should also communicate our wins through the organisation so it is clear that we can add value and innovation to the organisation.

Moving past the 'Now'

How can we achieve? How indeed! We need to think strategically by aligning with like-minded people - to think past the 'now'. To achieve a debate we can make use of technology, the media, email, websites, blogs, papers, newspapers and face to face conferences. These are the quickest and widest communication tools.

In addition, both buyer and supplier need to work together to promote discussion and facilitate gatherings for such discussions. Procurement is not one sided.

What does Procurement leadership look like? Procurement leaders lead by example and promote procurement as a fair, transparent and accountable process. There is a huge need for debate(s) to discuss how we can find effective leaders as well as encouraging positive leadership to promote procurement reform.
SUPPLIERS

Suppliers do not often provide leadership and this may arise from their frustration and cynicism. They have been ‘beaten down’ over the years and they are not inclined to be proactive. This is a shame but perhaps it is a case of ‘chickens coming home to roost’ from many years of non-involvement in open buyer/supplier discussions.

Procurement Associations and the like need to take a broader approach and include both buyers and suppliers.

Where do suppliers fit in? It is time for suppliers to ask for change, for a new direction and involvement, to promote procurement as a way for change.

Suppliers should provide leadership and leaders to contribute to the debate. They have an important role to play and we would be foolish to leave them out.

Buyers need to bring them along with us and recognise that both sides need each other.

Suppliers equally need to be innovative and to deliver well in austere times. If they do not, then their competition will. It is that simple.

SUMMARY

Innovation is more than financial – it is about adding to what procurement is about. Innovation and value creation can also be about adding value to our own skills/roles. This conference is an ideal opportunity with all of you here to contribute to the transformation we know is needed for procurement.

What is stopping us? What can be the first step - that is the question - perhaps this Conference can consider this today.

Procurement needs involved practitioners. We need ideas and for procurement to have a ‘voice’. Procurement requires leaders so we can have input into making procurement flow better and we can have add realism to the conversation.

Austerity is not the time for negativity – but it is the time for some big and different thinking – and action. Innovation is vital and useful in today’s environment and essential when operating in the public environment. Austere times calls for a change from business as usual. We cannot continue to operate the same way. Let us hope that the public sector can lead the way.

Two final questions: Where are our Procurement Leaders? Where is the procurement leadership coming from? Where indeed? Can we afford to sit back? I think not. How long are we going to wait? Do we lose another generation of procurement practitioners before we can provide effective procurement leaders and leadership? We need to start now – where are you?

It is obvious that there is a need for innovation and better governance. We should look at how we operate especially in times of austerity. The key is be proactive and to look at procurement strategically. Austerity provides opportunity – are you ready to take up the challenge? Hoping for the best is not practical or ideal. Ideas and implementation are key. . We cannot wait for better times – we have to manage in the times that we are in now. .

Any questions? Thank you.

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Market Orientation and SMEs’ Activity in Public Sector Procurement Participation

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ABSTRACT

SMEs have found to be under-represented in awarded public sector procurement contracts. Currently, very little is known of this distortion. To investigate the influences of SMEs strategic decisions and orientations on the activity of SMEs to participate in public sector procurement we use the conceptual construct known as market orientation. The construct comprehends the gathering of information of competitors and customer needs and preferences as well as the systematic use of the information to gain competitive advantage. We find that MO has a positive effect on how active SMEs are in searching information for available calls for tenders and how actively they participate in bidding contests. This is an important finding because SMEs could benefit from expanding their customer base to the public sector, and public procurers and policy makers are looking for ways to increase the participation rate of SMEs in public procurement. A managerial implication of this study is that the impact of MO should be taken into account when designing procurement contracts, and MO should be encouraged among SMEs.

Keywords: Public Sector Procurement, Market Orientation, SMEs

1. INTRODUCTION

Despite the fact that SMEs have a vital role in national and regional economies they are generally underrepresented in public procurement markets. In consequence, the welfare potential of producing and delivering goods and services through public procurement is insufficiently exploited. The underrepresentation is undesirable since the very idea of public procurement has been in exploiting the benefits of unrestricted competition between private firms when a public sector purchases goods, services or construction projects. The underrepresentation of SMEs in public procurement market has raised much discussion among the designers of public procurement architecture viz., authorities, specialists and lawyers especially within OECD, WTO and EU and their relevant institutions. As a matter of fact, EU has reformulated the directives of public procurement to better take into account SMEs opportunities to engage in public procurement and tenders. The next step will be the implementation of the directives via national legislative action in each member country. The general drift behind the reform is based on past experiences on the performance of public procurements and on surveys of SMEs to public procurement (KMU 2004 and GHK 2010). In spite of the documented experience and surveyed perceptions of SMEs we still lack an adequate understanding of the underrepresentation of SMEs and the factors that foster the SMEs’ participation on public procurement.

Two different paths can be taken to better understand the underrepresentation of SMEs in public procurements. One path is related to market structure and the inability of public procurement designs and laws to promote equally both the participation of SMEs and that of larger enterprises. The other path leads to the abilities and aspirations of SMEs themselves: for example, does an explicit strategy and organized utilization of the information on one’s business environment increase SMEs activity towards public procurements? There is quite scant but growing literature on procurement law and competition law in the context of public procurement (Sánchez Graells 2011 and Weishaar 2013) whereas research on the strategic and behavioral aspects of the participation of SMEs in public procurements is virtually absent.

1
In this paper we take the second path to explore a set of factors influencing on SMEs activity to participate in public procurements. We focus on the influence of a definite strategic construct known as market orientation which has been studied extensively in marketing and business economics literature since the 1990s (Kohli and Jaworski 1990, Narver and Slater 1990). Market orientation comprises a firm’s strategic orientation towards generating market information, analyzing it and responding in a relevant way (see Maydeu-Olivares and Lado 2003). Strong market orientation is found to have a positive influence on various aspects in SME performance such as competing with larger firms, selecting the most productive resource combinations, and responding to customers’ (often) varying needs (Raju, Lonial & Crum 2011, Morgan, Vorhies & Mason 2009, Baker and Sinkula 2009). Strong market orientation implies also high interest in finding new opportunities and markets (Reijonen et al. 2012). We expect that market orientation also positively affects on firms’ activity both in acquiring information of public sector tender calls and in submitting bids in these tender calls.

Our approach has two novelties. First, it is the first empirical analysis of the relationship between a firm’s strategic orientation and its activity in public procurements. Therefore it provides important new knowledge of the factors influencing SMEs’ behavior and activity in participating public procurement markets. Secondly, it contributes to the literature on the role and significance of market orientation for SMEs’ overall behavior by providing evidence that the strategic orientation of a firm has an important relationship to its performance not only in ‘traditional’ private markets but also in public procurement markets.

The rest of the paper goes as follows. The section two provides a literature review which covers both the role of SMEs in public procurement and research on market orientation. The section also sets the hypotheses for the empirical analysis. In the third section we introduce the data and the methods of analysis. Section four consists of the results of our analysis and section five concludes the paper by providing a discussion of the results, the managerial implications of them and the limitations and future possibilities in this line of research.

## 2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

### 2.1 SMEs and public procurement

In most economies the public sector is an important buyer of goods and services from the private sector. In EU, for example, the public sector’s purchases from private enterprises account for one sixth of the total GDP (Arrowsmith 2009). On that account, public sector procurement serves as an arena of ample business opportunities for firms of all size-classes. However, SMEs are severely under-represented in public procurement markets. SMEs secure only approximately 60 % of the contracts above the EU thresholds, and measured by the contract value, the SMEs’ share is only 34 % which is 18 percentage points less than their contribution to the total business revenue in the economy (GHK 2010). Especially micro and small enterprises are disadvantaged in the acquisition of public sector customers, because medium-sized firms do not differ from large corporations in their ability to secure procurement contracts (GHK 2010). In addition, when contract values increase beyond 300 000 Euro, SMEs are increasingly unlikely to win large contracts (ibid.).

SMEs face numerous impediments that hinder their access to public procurement. One obvious reason could be a limited supply capacity resulting from a lack of economies of scale (Bovis 1998; Karjalainen and Kemppainen 2008). Loader (2013) divides the impediments in two categories. In the first category, there are imperfections of the public sector environment and procurement processes. These imperfections are related to things such as policy, procurement organization and culture, contract requirements and the tendering process. In the second category, there are problems stemming from capacity constraints, lack of skills and attitudes to public procurement. Evidence shows, for example, that SMEs (i) quite seldom plan and use a formal customer acquisition process (Wang et al 2007), (ii) meet difficulties in using resources in new ways (Ambrosini et al. 2009), (iii) have problems in getting financial and human resources, and (iv) lack legal and administrative resources (Karjalainen and Kemppainen 2008).

Recently, the importance of increasing the participation of SMEs in public procurement markets has been recognized by EU policy makers and specialists. The core idea in this encouraging is the identifying and sharing of good practices among the EU member countries (European Commission 2011). The Commission of the European Communities (2008) sees that a more active participation of SMEs would increase competition in the public procurement markets and, consequently, increase value for money in public sector purchases and, in addition, contribute positively to the creation of jobs, economic growth and rate of innovations. In addition, there are other obvious and important benefits of increased participation, such as improved efficiency, better access to market knowledge, more extensive creation of value added and increase in the number of innovative
solutions (Van Ham and Koppenjan 2002). Finally, it has also been argued that since SMEs are usually local by their nature, they are capable of adapting to the local circumstances and to the needs of the local contracting authorities (Fee, Erridge and Hennigan 2002). The local nature of SMEs also provides an opportunity for public purchasers to realize wider responsibility to the local economy and society (Preuss 2011).

Finally, since our purpose is to analyze how SMEs’ strategic orientation influences on their activity to participate in public procurement markets, it is worth of picking out some general features which may make public sector an attractive customer. First, public sector is typically a buyer who tends to commit to quite long-term contracts and to prompt, timely payments. This reduces the volatility of cash flows and risks related to it (ACCA 2009). Second, being a supplier to public sector may also serve as a shield towards the recessionary periods typical in the private sector economic activity (The Procurement Group 2012). Third, many SMEs who are subcontractors to larger corporations in public procurement might get greater financial rewards when contracting directly with the public sector (ACCA 2009). Finally, by increasing its performance in public procurement markets a SME may win prestigious reference contacts from the public sector (The Procurement Innovation Group 2009).

2.2 Market orientation
Market orientation (MO) has been traditionally defined as an organizational culture (Narver and Slater 1990) or as a set of activities (Kohli and Jaworski 1990). These approaches do not exclude one another as from the cultural perspective MO’s three components, namely customer orientation, competitor orientation and interfunctional coordination, comprise the market-oriented activities of acquiring, sharing and responding to market information (Narver & Slater 1990). The idea behind both definitions is that MO is about providing superior customer value that is based on market intelligence. By meeting and satisfying customer needs firms can create competitive advantage and achieve superior performance.

Prior studies have shown that MO is relevant for SMEs who have limited financial means, such as R&D, low cost leadership or talented staff, to pursue other sources of business (González-Benito, González-Benito & Muñoz-Gallego 2013). Despite these liabilities of smallness and sometimes newness, SMEs are often highly market-oriented and they can compete effectively with large organizations (Raju, Lonial & Crum 2011). MO offers them a knowledge advantage that helps them to select the most productive resource combinations available to match market conditions (Morgan, Vorhies & Mason 2009). Furthermore, it is suggested that MO may benefit small firm performance more than that of larger firms, one reason for this being that they might be better at identifying and leveraging their strengths (Raju, Lonial & Crum 2011).

It could be argued that MO affects SMEs’ ability and willingness to actively seek information about and participate in public tendering. Firstly, as MO is about generating market intelligence, it could be assumed that MO directs attention also towards information regarding public tendering. Secondly, with the help of MO, SMEs are better able to assess whether their strengths as well as the resource combinations available to them fit the needs of the public sector buyer in general and also the requirements of the tender call at hand in particular. The results of these assessments can either encourage or hinder their participation in public tendering. Thus, we hypothesize:

H1A: MO affects how actively SMEs look for public sector tender calls
H1B: MO affects how actively SMEs submit bids in public sector tender calls

Customer orientation
In addition to studying MO as whole we further examine how the different dimensions of MO, namely customer orientation, competitor orientation and interfunctional coordination, affect SMEs’ activity to look for tendering opportunities and to submit bids in public sector tender calls. Prior research has shown that the different dimensions can have different impact, for example, on product innovation (Lukas & Ferrell 2000) and firm performance (Dev et al. 2009, Reijonen et al. 2012). We suggest that their influence on the activity to take part in public tendering may also vary.

Customer element is central in MO (Kohli & Jaworski 1990). The dimension of customer orientation represents a firm’s understanding of its customers so that it can offer them superior value not only at the present but also in anticipation of the future (Narver & Slater 1990; Zhou, Brown & Dev 2009). This understanding is based on collecting and processing information about customer preferences (Lukas & Ferrell 2000). As gathering information is a prominent part of customer orientation, it could be argued that MO affects SMEs activity in searching information about public sector tender calls. Through this information, they acquire better understanding about the customer and thus, they will be in a good position to assess whether they are able to
meet the needs of the customer. Therefore, customer orientation can affect also their willingness to submit bids in the public sector tender calls.

H2A: Customer orientation affects how actively SMEs look for public sector tender calls
H2B: Customer orientation affects how actively SMEs submit bids in public sector tender calls

**Competitor orientation**
Competitor-oriented firms monitor their competitors, react to their marketing initiatives and try to understand their short-term strengths and weaknesses and long-term strategies and capabilities (Zhou, Brown & Dev 2009). In other words, competitor orientation relates to the firm’s understanding of its competitors and how they endeavor to satisfy customer needs (Narver & Slater 1990). At the same time, competitor orientation helps firms to identify their own weaknesses and strengths and also to choose the strategy how to compete (Zhou, Brown & Dev 2009). When comparing themselves against their rivals competitor-oriented firms can assess their possibilities to succeed in public tendering. This in turn affects their willingness to take part in it. Thus, we hypothesize:

H3A: Competitor orientation affects how actively SMEs look for public sector tender calls
H3B: Competitor orientation affects how actively SMEs submit bids in public sector tender calls.

**Interfunctional coordination**
Little is achieved with collecting and disseminating market intelligence about customers and competitors if it is not exploited in practice (Kohli & Jaworski 1990). Interfunctional coordination reflects firms’ coordinated efforts and utilization of resources to create superior value to customers (Narver & Slater 1990). In a way it represents the essence of MO; that is the commitment to respond to customer needs in order to maximize their satisfaction (Baker & Sinkula 2009). This responsiveness is shown, for example, in selecting the target markets and designing services and products (Kohli & Jaworski 1990). When reflecting its abilities and resources interfunctional coordination can affect whether a firm sees public sector as an attractive customer and thus, whether it is active in taking part in public tendering.

H4A: Interfunctional coordination affects how actively SMEs look for public sector tender calls
H4B: Interfunctional coordination affects how actively SMEs submit bids in public sector tender calls

### 3. QUESTIONNAIRE DEVELOPMENT, DATA AND METHODS

#### 3.1 Questionnaire development
To test our hypotheses we collected data from SMEs by using a questionnaire method. In addition to measuring SMEs’ activity in public sector procurement and SMEs market orientation, we gathered information on several background factors. From these, firm size, firm age, and the main industry were used as control variables in our analysis. The questionnaire was sent to firms in North Karelia, Finland, in September 2012. Contact information was provided by the local regional development company, JOSEK Ltd (Joensuu Regional Development Company). The enterprises or for-profit organizations which located in North Karelia and employed up to 249 persons were selected for the study. An online questionnaire was sent to 3305 recipients from whom 240 responded (7.2 percent being the response rate). From this sample, 191 responses were eligible for our study.

Prior research has used different measures of market orientation. One of the best known measures is the 20-item market orientation scale (MARKOR) developed by Kohli et al. (1993). MARKOR focuses on the measurement of activities relating to the generation of market intelligence, its dissemination within the organization and responsiveness to it. Deng and Dutt (1994) adopted Narver’s and Slater’s (1990) cultural view on market orientation and established a measure that comprises four components: customer orientation, competitor orientation, interfunctional coordination and profit emphasis. Gray et al. (1998) subsequently developed what they call “a better measure of market orientation” in which the ideas of Narver and Slater (1990), Jaworski and Kohli (1993) and Deng and Dutt (1994) are integrated. The results of Gray et al.’s (1998) study show that some of the variables measuring intelligence dissemination (Jaworski and Kohli 1993) can be combined with the measures of interfunctional coordination (Narver and Slater 1990).

In the current study we examine market orientation through the following three elements: customer orientation, competitor orientation and interfunctional coordination (Narver & Slater 1990). However, as suggested by Gray et al. (1998), the scale measuring interfunctional coordination includes variables relating to intelligence dissemination. The items we used to measure market orientation and its elements are reported in Table 1.
Table 1. Measure items of market orientation in the questionnaire (Reijonen et al. 2012)

<table>
<thead>
<tr>
<th>Measure items</th>
<th>Source</th>
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<tbody>
<tr>
<td><strong>Customer orientation</strong></td>
<td></td>
</tr>
<tr>
<td>(1) We have a strong commitment to our customers</td>
<td>Gray et al. (1998); Deng and Dart (1994); Narver and Slater (1990)</td>
</tr>
<tr>
<td>(2) We are always looking at ways to create customer value in our products</td>
<td>Gray et al. (1998); Deng and Dart (1994); Narver and Slater (1990)</td>
</tr>
<tr>
<td>(3) We encourage customer comments and complaints because they help us do a</td>
<td>Gray et al. (1998); Deng and Dart (1994); Narver and Slater (1990)</td>
</tr>
<tr>
<td>better job</td>
<td></td>
</tr>
<tr>
<td>(4) Our business objectives are driven by customer satisfaction.</td>
<td>Farrell et al. (2008); Narver and Slater (1990)</td>
</tr>
<tr>
<td>(5) We measure customer satisfaction on a regular basis</td>
<td>Narver and Slater (1990)</td>
</tr>
<tr>
<td><strong>Competitor orientation</strong></td>
<td></td>
</tr>
<tr>
<td>(6) After-sales service is an important part of our business strategy</td>
<td></td>
</tr>
<tr>
<td>(7) We regularly monitor our competitors’ marketing efforts</td>
<td>Gray et al. (1998); Deng and Dart (1994)</td>
</tr>
<tr>
<td>(8) We frequently collect marketing data on our competitors to help direct</td>
<td>Gray et al. (1998); Deng and Dart (1994)</td>
</tr>
<tr>
<td>our marketing plans</td>
<td></td>
</tr>
<tr>
<td>(9) Our people are instructed to monitor and report on competitor activity</td>
<td>Gray et al. (1998); Deng and Dart (1994)</td>
</tr>
<tr>
<td>(10) We respond rapidly to competitors’ actions</td>
<td>Gray et al. (1998); Deng and Dart (1994); Narver and Slater (1990)</td>
</tr>
<tr>
<td>(11) Our top managers often discuss competitors’ actions</td>
<td>Gray et al. (1998); Deng and Dart (1994); Narver and Slater (1990)</td>
</tr>
<tr>
<td>(12) We target customers and customer groups where we have, or can develop,</td>
<td>Farrel et al. (2008); Deng and Dart (1994); Narver and Slater (1990)</td>
</tr>
<tr>
<td>competitive advantage</td>
<td></td>
</tr>
<tr>
<td><strong>Interfunctional coordination</strong></td>
<td></td>
</tr>
<tr>
<td>(13) Market information is shared inside our organization</td>
<td>Gray et al. (1998); Deng and Dart (1994)</td>
</tr>
<tr>
<td>(14) Persons in charge of different activities in our organization</td>
<td>Gray et al. (1998); Deng and Dart (1994)</td>
</tr>
<tr>
<td>are involved in preparing business plans/strategies</td>
<td></td>
</tr>
<tr>
<td>(15) We do a good job integrating the activities inside our organization</td>
<td>Gray et al. (1998); Deng and Dart (1994)</td>
</tr>
<tr>
<td>(16) We regularly have inter-organizational meetings to discuss</td>
<td>Gray et al. (1998); Jaworski and Kohli (1993)</td>
</tr>
<tr>
<td>market trends and developments</td>
<td></td>
</tr>
<tr>
<td>(17) We regularly discuss customer needs in our organization</td>
<td>Gray et al. (1998); Jaworski and Kohli (1993)</td>
</tr>
</tbody>
</table>

In measuring firms’ activity in participating in public sector procurement we used two dimensions, the activity in seeking open tendering opportunities (referred to as SEEK_OPP as a variable) and the activity in submitting bids (referred to as SUB_BID as a variable). The following question involved the activity in seeking: “Does your firm look for public sector tender calls?” The alternative answers were “Never”, “Irregularly”, “Regularly”, which were coded as 1, 2 and 3, respectively. As for the activity in submitting bids the following question was presented: “How many times have you submitted a bid to public sector tender calls?” The respondent was then asked to choose from the following categories: “Not at all”, “From 1 to 5 times”, “From 6 to 10 times”, “From 11 to 20 times”, “From 21 to 30 times”, “From 31 to 40 times”, “From 41 to 50 times”, “More than 50 times”, which were coded from 1 to 8, respectively.

3.2 Descriptive statistics: Respondents and the variables in the analyses

Table 2 shows the distribution of the respondents’ occupational positions. In all 78.5 percent of the respondents are full-time entrepreneurs and owners, 7.9 percent are part-time entrepreneurs and owners, but only 2.6 percent are hired CEOs. Only 11.0 percent of respondents are experts, clerical workers or workers. It is therefore reasonable to assume that the majority of respondents were well-acquainted about their firms’ operations and strategic orientations.
Table 2. Respondents’ background information

<table>
<thead>
<tr>
<th>Respondent’s position</th>
<th>(%)</th>
<th>Sales turnover (in euros)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time entrepreneur, owner</td>
<td>78.5</td>
<td>Less than 100 000</td>
<td>34.6</td>
</tr>
<tr>
<td>Part-time entrepreneur, owner</td>
<td>7.9</td>
<td>100 000 – 199 999</td>
<td>15.7</td>
</tr>
<tr>
<td>CEO</td>
<td>2.6</td>
<td>200 000 – 399 999</td>
<td>13.1</td>
</tr>
<tr>
<td>Expert</td>
<td>2.6</td>
<td>400 000 – 999 999</td>
<td>14.1</td>
</tr>
<tr>
<td>Clerical worker</td>
<td>6.8</td>
<td>1 000 000 – 1 999 999</td>
<td>11.5</td>
</tr>
<tr>
<td>Worker</td>
<td>1.6</td>
<td>2 000 000 – 19 999 999</td>
<td>9.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>More than 20 million</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Missing</td>
<td>0.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Main spatial operating area</th>
<th>(%)</th>
<th>Main customer type</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>26.7</td>
<td>Other firms</td>
<td>44.5</td>
</tr>
<tr>
<td>Provincial</td>
<td>36.6</td>
<td>Public sector</td>
<td>15.7</td>
</tr>
<tr>
<td>National</td>
<td>27.2</td>
<td>Consumers</td>
<td>39.3</td>
</tr>
<tr>
<td>International</td>
<td>9.4</td>
<td>Missing</td>
<td>0.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of employees</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sole entrepreneur (full- and part-time)</td>
<td>33.5</td>
</tr>
<tr>
<td>2 – 4</td>
<td>30.9</td>
</tr>
<tr>
<td>5 – 9</td>
<td>16.2</td>
</tr>
<tr>
<td>10 – 14</td>
<td>6.3</td>
</tr>
<tr>
<td>15 – 19</td>
<td>2.6</td>
</tr>
<tr>
<td>20 – 49</td>
<td>6.8</td>
</tr>
<tr>
<td>50 or more</td>
<td>1.0</td>
</tr>
<tr>
<td>Missing</td>
<td>2.6</td>
</tr>
</tbody>
</table>

Almost all firms in the sample are small and micro enterprises: more than a half of the responding firms report less than 400 000 euros in the annual sales turnover. Concerning the number of employees it appears that 83.2 percent of the firms are micro-size (less than 10 employees) and 15.7 percent of them are small size (10 – 49 employees). A typical firm’s spatial operating area is provincial and its main customers are other firms. No more than 15.7 percent of the firms report that a public sector organization is their main customer.

Descriptive statistics of the variables entered in the analysis are shown in tables 3 and 4. Table 3 shows that most firms (44 percent) seek open tenders irregularly and less than 30 percent regularly; 26.2 percent of the firms never seek open tenders. However, 41.9 percent of the firms have never submitted a bid and 30.9 percent have submitted 1 – 5 times and 8.4 percentage 6 – 10 times.

Table 3. Activity in public procurement

<table>
<thead>
<tr>
<th>Seeks open public tendering opportunities</th>
<th>(%)</th>
<th>Has submitted a bid in a public tender call</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>26.2</td>
<td>Never</td>
<td>41.9</td>
</tr>
<tr>
<td>Irregularly</td>
<td>44.0</td>
<td>1 – 5 times</td>
<td>30.9</td>
</tr>
<tr>
<td>Regularly</td>
<td>29.8</td>
<td>6 – 10 times</td>
<td>8.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11 – 20 times</td>
<td>4.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 – 30 times</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>31 – 40 times</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>41 – 50 times</td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>More than 50 times</td>
<td>6.3</td>
</tr>
</tbody>
</table>

The firm size is measured as the number of employees in a firm (zero as a minimum meaning a part-time sole entrepreneur). The largest firm has 75 employees and the mean size is 5.9 employees. The firm age is measured in years; the youngest firms are one year old, the oldest 113 years old, and the average age is 18.3 years. We use a five-class categorization of the firms’ industries – the largest class (except ‘others’) being production industries (23.0 percent) followed by knowledge-based service industries (19.4 percent), trade and related industries (16.8 percent) and, finally, human health and social work activities (9.9 percent). Table 4 shows also
correlations between the variables (including MO and its components as well as the descriptive statistics of them).

3.3 Methods
The data analysis was performed in two steps. First, the principal component extraction with Varimax rotation was carried out to obtain the measures for market orientation and its separate elements. Second, multinomial and ordered logistic regressions were used to analyze SMEs' activity in participating public procurement markets. The dependent variables in the regressions are either SEEK_OPP or SUB_BID. Predictors are either a one-dimensional measure for market orientation (MOR) or the three separate elements of MO. Firm size, firm age and firm industry are included as control variables (e.g. Soininen, et al. 2012a; Clausen and Korneliussen 2012).
Table 4. Descriptive statistics and correlations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Descriptive statistics</th>
<th>Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEEK OPP (1)</td>
<td>2.037</td>
<td>.750</td>
</tr>
<tr>
<td>SUB BID (2)</td>
<td>2.424</td>
<td>1.974</td>
</tr>
<tr>
<td>IND 1 (3)</td>
<td>.230</td>
<td>.422</td>
</tr>
<tr>
<td>IND 2 (4)</td>
<td>.168</td>
<td>.374</td>
</tr>
<tr>
<td>IND 3 (5)</td>
<td>.194</td>
<td>.396</td>
</tr>
<tr>
<td>IND 4 (6)</td>
<td>.099</td>
<td>.300</td>
</tr>
<tr>
<td>IND 5 (7)</td>
<td>.309</td>
<td>.463</td>
</tr>
<tr>
<td>SIZE PRS (8)</td>
<td>5.884</td>
<td>9.723</td>
</tr>
<tr>
<td>FIRM AGE (9)</td>
<td>18.267</td>
<td>15.23</td>
</tr>
<tr>
<td>CUSTOR (10)</td>
<td>.000</td>
<td>1</td>
</tr>
<tr>
<td>COMPOR (11)</td>
<td>.000</td>
<td>1</td>
</tr>
<tr>
<td>INTFC (12)</td>
<td>.000</td>
<td>1</td>
</tr>
<tr>
<td>MOR (13)</td>
<td>.000</td>
<td>1</td>
</tr>
</tbody>
</table>

Notes:  
IND 1: Manufacturing, electricity, gas, steam and air conditioning supply, water supply; sewerage, waste management and remediation activities, construction.  
IND 2: Wholesale and retail trade, repair of motor vehicles and motorcycles, transportation and storage.  
IND 3: Information and communication, real estate activities, professional, scientific and technical services, administrative and support service activities, education, arts, entertainment and recreation.  
IND 4: Human health and social work activities.  
IND 5: Others (including accommodation and food services, agriculture, forestry and fishing).
4. RESULTS

4.1 Principal component analysis

The components extracted in the principal component analysis are reported in Tables 5 and 6. The analysis used the item bank introduced in Table 1. Varimax with Kaiser normalization was used in the rotation. In Table 5, market orientation (referred to as MOR as a variable) as a single component has a highly acceptable value for Cronbach’s Alpha (0.891). Thus, the measure can be considered to be reliable, and it explains 46.2% of the variance in the survey responses. Original items 1, 3, 4, and 5 (in Table 1) were dropped out because of low factor loadings.

Table 5. Principal component solution for market orientation.

<table>
<thead>
<tr>
<th>Market orientation</th>
<th>Alpha</th>
<th>Initial eigenvalue</th>
<th>Percentage of variance explained</th>
<th>Factor loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>We are always looking at new ways to create customer value in our products</td>
<td>0.493</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>After-sales service is an important part of our customer strategy</td>
<td>0.480</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We regularly monitor our competitors’ marketing efforts</td>
<td>0.766</td>
<td></td>
<td></td>
<td>0.790</td>
</tr>
<tr>
<td>We frequently collect marketing data on our competitors to help direct our marketing plans</td>
<td>0.790</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our people are instructed to monitor and report on competitor activity</td>
<td>0.690</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We respond rapidly to competitors’ actions</td>
<td>0.774</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our top managers often discuss competitors’ actions</td>
<td>0.772</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We target customers and customer groups where we have, or can develop, competitive advantage</td>
<td>0.626</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market information is shared inside our organization</td>
<td>0.770</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Persons in charge or different activities in our organization are involved in preparing business plans/activities</td>
<td>0.684</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We do a good job integrating the activities inside our organization</td>
<td>0.596</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We regularly discuss customer need in our organization</td>
<td>0.616</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: N = 191; Rotation: Varimax; Normalization: Kaiser; Bartlett’s test of sphericity: $\chi^2 = 1055.751$ (p-value < 0.001); Kaiser-Meyer-Olkin measure of sampling adequacy: 0.890.

Table 6 shows the principal components for the separate dimensions of market orientation, namely competitor orientation (referred to as COMPOR as a variable), customer orientation (referred to as CUSTOR as a variable), and interfunctional coordination (referred to as INTFC as a variable). The alphas are all highly acceptable ranging from 0.786 to 0.889 suggesting of the reliability of the measuring scales. One item (item 4 in Table 1) was dropped from the analysis due to its low loading. Each component explains approximately 20% of the variance in the survey responses the total explanatory percentage being 63%.
Table 6. Principal component solution for the components of market orientation.

<table>
<thead>
<tr>
<th>Component</th>
<th>Alpha</th>
<th>Initial eigenvalue</th>
<th>Percentage of variance explained</th>
<th>Factor loading</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Customer orientation</strong></td>
<td>0.786</td>
<td>1.449</td>
<td>0.192</td>
<td>0.719</td>
</tr>
<tr>
<td>We have a strong commitment to our customers</td>
<td>0.719</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We are always looking at new ways to create customer value in our products</td>
<td>0.663</td>
<td></td>
<td></td>
<td>0.793</td>
</tr>
<tr>
<td>We encourage customer comments and complaints because they help us do a better job</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We measure customer satisfaction on a regular basis</td>
<td>0.809</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>After-sales service is an important part of our customer strategy</td>
<td>0.526</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Competitor orientation</strong></td>
<td>0.889</td>
<td>6.103</td>
<td>0.232</td>
<td>0.838</td>
</tr>
<tr>
<td>We regularly monitor our competitors’ marketing efforts</td>
<td>0.838</td>
<td></td>
<td></td>
<td>0.895</td>
</tr>
<tr>
<td>We frequently collect marketing data on our competitors to help direct our marketing plans</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our people are instructed to monitor and report on competitor activity</td>
<td>0.751</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We respond rapidly to competitors’ actions</td>
<td>0.724</td>
<td></td>
<td></td>
<td>0.706</td>
</tr>
<tr>
<td>Our top managers often discuss competitors’ actions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interfunctional coordination</strong></td>
<td>0.852</td>
<td>2.470</td>
<td>0.202</td>
<td>0.625</td>
</tr>
<tr>
<td>Market information is shared inside our organization</td>
<td>0.625</td>
<td></td>
<td></td>
<td>0.721</td>
</tr>
<tr>
<td>Persons in charge or different activities in our organization are involved in preparing business plans/activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We do a good job integrating the activities inside our organization</td>
<td>0.786</td>
<td></td>
<td></td>
<td>0.798</td>
</tr>
<tr>
<td>We regularly have interorganizational meetings to discuss market trends and developments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We regularly discuss customer needs in our organization</td>
<td>0.703</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: N = 191; Rotation: Varimax; Normalization: Kaiser; Bartlett’s test of sphericity: $\chi^2 = 1392.792$ (p-value < 0.001); Kaiser-Meyer-Olkin measure of sampling adequacy: 0.888; cumulative rotation sum of squared loading: 62.6

4.2 Regressions

The impact of market orientation and its components on the SMEs’ activeness in public procurement was analyzed with four separate regression models. The dependent variable in models 1 and 2 is $SEEK\_OPP$ which measures the activity in finding out public tendering opportunities. In models 3 and 4, the dependent variable is $SUB\_BID$ measuring the activity in submitting bids to the public sector’s calls for bids. The variables of interest in the regression models are the measures for market orientation extracted with principal component analysis. We use logarithms of the firm size and firm age and industry dummies as control variables. The regression results are reported in Table 7 for all models.

Models 1 and 2 are analyzed with multinomial logistic regression. We use the response “never” (= 1) as the baseline value. Model 1 indicates that the market oriented firms are more likely to exhibit either irregular or regular activity in finding public tendering opportunities. In consequence, we cannot reject H1A. The control variables show that larger firm size and the companies in the human health care and social work industry are more likely to show regular activity.

Model 2 studies how the individual components of market orientation are related to the activity in seeking public tenders. Although all three components exhibit a positive sign, only interfunctional coordination is statistically significant in both irregular and regular activity. As a result, we can reject H2A and H3A, but not H4A.

Models 3 and 4 are analyzed with ordered logistic regression. They measure how market orientation is connected with the activity in submitting bids to the public sector’s bidding contests. Model 3 indicates that market orientation plays a role in activity as the estimate is positive and marginally significant (p-value < 0.1). Thus, we cannot reject H1B.

Model 4 shows that interfunctional coordination is the component that is positively linked with bidding activity, whereas other components have a positive sign but are not statistically significant. Therefore, we can reject H2B and H3B, but not H4B. From control variables, the firm size and firm age have a positive correlation with the bidding activity.
In summary, we find evidence that market orientation and its components have a positive relationship with the SMEs’ activity in public procurement. After controlling for the firm size, age and industry, we find that the firms that have adopted market orientation are more active in seeking tendering opportunities and submitting bids in tender calls of the public sector. Our further analysis shows, that while all three elements of market orientation have a positive sign, interfunctional coordination is the element that has a statistically significant positive connection with the activity.
Table 7. Regression estimates for multinomial logistic regression and ordered logistic regression.

<table>
<thead>
<tr>
<th>Model</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Multinomial logistic regression</td>
<td>Multinomial logistic regression</td>
<td>Ordered logistic regression</td>
<td>Ordered logistic regression</td>
</tr>
<tr>
<td></td>
<td>SEEK OPP = 2</td>
<td>SEEK OPP = 3</td>
<td>SEEK OPP = 2</td>
<td>SEEK OPP = 3</td>
</tr>
<tr>
<td></td>
<td>SUB BID</td>
<td>SUB BID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependent variable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IND_1</td>
<td>.765</td>
<td>.832</td>
<td>.767</td>
<td>.889</td>
</tr>
<tr>
<td></td>
<td>(.544)</td>
<td>(.637)</td>
<td>(.558)</td>
<td>(.662)</td>
</tr>
<tr>
<td>IND_2</td>
<td>.661</td>
<td>1.112</td>
<td>.602</td>
<td>1.105</td>
</tr>
<tr>
<td></td>
<td>(.617)</td>
<td>(.697)</td>
<td>(.631)</td>
<td>(.717)</td>
</tr>
<tr>
<td>IND_3</td>
<td>.206</td>
<td>.195</td>
<td>.120</td>
<td>.118</td>
</tr>
<tr>
<td></td>
<td>(.507)</td>
<td>(.649)</td>
<td>(.519)</td>
<td>(.663)</td>
</tr>
<tr>
<td>IND_4</td>
<td>1.003</td>
<td>2.070**</td>
<td>.797</td>
<td>1.814**</td>
</tr>
<tr>
<td></td>
<td>(.788)</td>
<td>(.846)</td>
<td>(.797)</td>
<td>(.860)</td>
</tr>
<tr>
<td>Ln(SIZE PRS)</td>
<td>.215</td>
<td>1.086***</td>
<td>.306</td>
<td>1.140***</td>
</tr>
<tr>
<td></td>
<td>(.250)</td>
<td>(.319)</td>
<td>(.292)</td>
<td>(.334)</td>
</tr>
<tr>
<td>Ln(FIRM AGE)</td>
<td>.251</td>
<td>.027</td>
<td>.169</td>
<td>.025</td>
</tr>
<tr>
<td></td>
<td>(.284)</td>
<td>(.297)</td>
<td>(.266)</td>
<td>(.315)</td>
</tr>
<tr>
<td>CUSTOR</td>
<td>-</td>
<td>-</td>
<td>.172</td>
<td>.336</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>(.190)</td>
<td>(.236)</td>
</tr>
<tr>
<td>COMPOR</td>
<td>-</td>
<td>-</td>
<td>.148</td>
<td>.134</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>(.210)</td>
<td>(.243)</td>
</tr>
<tr>
<td>INTFC</td>
<td>-</td>
<td>-</td>
<td>.434**</td>
<td>.721***</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>(.197)</td>
<td>(.245)</td>
</tr>
<tr>
<td>MOR</td>
<td>.421**</td>
<td>.615**</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(.207)</td>
<td>(.243)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Observations</td>
<td>185</td>
<td>182</td>
<td>185</td>
<td>182</td>
</tr>
<tr>
<td>$\chi^2$</td>
<td>42.86***</td>
<td>44.17***</td>
<td>45.66***</td>
<td>46.22***</td>
</tr>
<tr>
<td>Pseudo-$R^2$</td>
<td>.108</td>
<td>.114</td>
<td>.081</td>
<td>.084</td>
</tr>
</tbody>
</table>

Notes: SEEK OPP = 1 is the baseline value in multinomial logistic regression. IND_5 is the reference category for the industry dummy variables. * p-value < 0.1; ** p-value < 0.05; *** p-value < 0.01.
5. DISCUSSION
5.1 Conclusion
This study examines how a firm’s activity to participate in public procurement markets is influenced by its strategic orientation towards gathering market information and using it in an organized way. This strategic orientation is defined and operationalized in the relevant literature with the construct of market orientation. This refers activities to acquire, share and respond to market information while its different dimensions refer to customer orientation, competitor orientation and firm’s interfunctional coordination in gathering and utilizing market information (Narver & Slater 1990). How this strategic orientation is related to SME participation in public procurement has not been previously reported in the literature. Therefore, this paper is an important contribution to the literature of public procurement, and it also provides further evidence on the importance of market orientation in SMEs’ performance.

The results show that after controlling for firm size, firm age and industry, the firms that have adopted market orientation are more active in both seeking tendering opportunities and submitting bids in the public sector’s calls for tenders. A closer look into the different dimensions of market orientation shows that while customer orientation, competitor orientation and interfunctional coordination all have a positive sign, only the last one is statistically significant. This finding seems to suggest that while it is important for SMEs to know the public sector customer and its preferences as well as the competitors’ means to meet those preferences, what it comes down to is the assessment of the firm whether its own abilities and resources are adequate to satisfy the customer’s expressed needs. The value adding integration of people, resources and activities seems to have a big impact on the SME activity with regards to public tendering.

In addition to the new knowledge concerning the role of market orientation in SMEs activity in participating public procurement markets, the results have a bearing on the general literature on the importance of market orientation and its three dimensions on the performance of SMEs. First and foremost, our results suggest that the applicability of the theoretical approach of market orientation goes beyond the traditional boundaries of private markets, also to markets constructed by public authorities.

In sum, this study shows that market orientation, and especially interfunctional coordination as one of its dimensions, has a clear positive connection with SMEs activity in finding information about business opportunities in public procurement and, more importantly, submitting bids in calls for tenders. Thus, encouraging the adoption of market orientation within a firm could increase chances of obtaining public sector customers.

5.2 Managerial implications
Researchers and policy makers share a concern of SMEs’ low participation rate in public procurement. For them this study emphasizes the importance of market orientation in the strategic management of SMEs regarding public procurement. To this end, SMEs would greatly benefit from gathering information about potential customers and disseminating it within the boundaries of the firm. Furthermore, the public sector procurement authorities could support this by providing feedback to its suppliers to enable them further improve their products and services.

As interfunctional coordination seems to play an important role, those SMEs that are interested in taking part in public tendering should pay special attention to integrating different people and activities in the process. In this they should not only focus on what is inside their own firm. To overcome their limitations SMEs could actively search for network partners with whom they could cooperate and integrate their resources. Also authorities could encourage and facilitate this kind of cooperation in public procurement.

5.3 Limitations and future research
As all research, this study has some limitations. Firstly, the survey was carried out in a single geographic area. Thus, different results could be obtained from other regions or countries. Secondly, most firms in the study interacted with a centralized contracting authority. As a result, interacting with many contracting authorities might provide different answers. Third, the use of electronic procurement was required by the contracting authority in the study for most respondents. Therefore, traditional forms of procurement might provide different results.

REFERENCES


The effect of collaboration procurement strategy and procurement competence on public procurement innovation and effectiveness

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Abstract: The main goal of the present study is to investigate how collaborative relationships, procurement strategy, and procurement competence influence the innovation and effectiveness of public procurement. Furthermore it is investigated what is the impact of innovation on public procurement effectiveness. Collaboration and co-operation have become strategic issues for the effectiveness of public service procurement. Furthermore collaboration has an important role in innovation generation. Additionally organization strategy and human resources competences play important roles on organization’s innovativeness capability. The empirical data used in this study is drawn from a dataset collected using a structured online questionnaire. The questionnaire was send to public sector’s experts and managers responsible with the procurement of public services in the social and health care domain in Finland. The results of the study show that strategic procurement has a strong influence on procurement effectiveness. Additionally collaborative relationships and procurement competence have influence on procurement innovation. Moreover, procurement innovation influences positively the procurement effectiveness, even if their relation is not very strong. The study has managerial implications, acting as a guideline for the public managers from the public procurement domain. The study shows what are the most important factors which must be addressed when the aim is to enhance the effectiveness of public procurement and to promote the innovations.

Introduction

1.1. Background of the study

Public procurement is an important function of every government which has a great impact on the economy of every country. Moreover, public procurement is used as a strategic tool for achieving economic and social objectives [1]. In European Union public sectors spend between 45-65% of their budgets on public procurement, which represents an average of 16% of their Gross National Product [2]. Public managers should find solutions to ensure that taxpayer funds are spend in the most efficiently manner, providing the best services to the public that is served [3], [4].

Although new solutions to improve the public procurement process have been searched continuously, public procurement efficiency still remains a big challenge for public sector. Mainly the challenges occur because the state and the local governments have faced a continuously fiscal pressure during the last years [5]. The managers attempted to control costs through work-force reduction, hiring freezes, or widespread cutbacks within their organization. These actions may create the illusion of efficiency, but the real change should be in processes improving [4]. New innovative solutions that are based on collaborative relationships with suppliers should be found continuously [6]. Additionally, the procurement function should be managed strategically, looking for the long-term objectives. All these management actions require high procurement competences for public managers [7].
During the last years new European directives [8], regulations [9], [10] and research recommendations [11], [12] have encouraged practitioners to adopt new ways of organizing the public procurement. Traditionally public procurement is based on competition, where the contracts are awarded to those that offer the lowest price. Currently research and practice have proven that collaboration is a better approach in public procurement [13], [14]. Collaboration allows finding better innovative solutions in public procurement, by addressing the challenges from a multitude of perspective, with a wide range of competencies of people from different domains [15]. The challenges that occur in nowadays society, which are reflected especially in the service public procurement, as well, are very complex. Among the challenges that occur in this domain, with implication in public procurement, can be mentioned here: the increasing number of old population, the limitation of resources (human resources, as well) [16], or the adoption of sustainable production and sustainable procurement [7]. These are among the most important challenges.

New innovative solutions and new ways of organizing public procurement have been adopted in the last years, but procurement effectiveness and procurement process related challenges and are still reported and mentioned in research and practice [15]. Research related to innovative public procurement [17], effective public procurement [18], or the adoption of green procurement [7] has emerged during the last years. However, there is little or no research which investigates what are the most important factors that affect the innovativeness and effectiveness of public procurement.

1.2. Objectives and benefits of the study

The objective of this study is to investigate which issues must be emphasized by public managers when the aim is towards a more innovative and effective procurement. The study approaches the most important factors that affect the innovativeness and effectiveness of public procurement. Additionally, it investigates what is the effect of innovative procurement on procurement effectiveness. More specifically, three research questions are addressed in this study:

1. What is the effect of collaborative relationships, procurement competence and procurement strategy on public procurement innovation?
2. What is the effect of collaborative relationships, procurement competence and procurement strategy on procurement efficiency?
3. What is the impact of public procurement innovation on procurement effectiveness?

The empirical data used in this study was drawn through a dataset collected using a structured online questionnaire. Public procurement managers and experts from the operation level in public procurement from public organizations in Finland were approached. They were asked about their perception on how public procurement process is organized in their organization and about perception on the factors that affect the procurement innovation and procurement effectiveness. The results of the study have implications on the management of public procurement, allowing public managers to identify what are the most important factors that must be addressed in order to increase the innovativeness and effectiveness of public procurement.

1.3. Outline of the study

Drawing on the procurement innovation and effectiveness of public procurement literature, the paper identifies and outlines the factors that may influence the procurement innovation, as well as procurement effectiveness. Based on the theoretical background, a series of hypotheses are developed. The hypotheses describe the moderating effects of three factors (collaborative relationships, procurement competence and strategic procurement) on procurement innovation, as well as on procurement effectiveness. Thereafter another hypothesis is developed, which describes the impact of innovative procurement on procurement effectiveness. This is followed by the research methods, where the case study and the sample used are described first. Under the same section the analysis method and the research method are presented in detail. Then the results of the study are presented. Results focus on testing the research model with partial least squares structural equation modeling. Finally, the discussions and the conclusions are outlined, where the managerial implications, limitation and future research are presented, as well.

Theoretical background and hypotheses

Two main concepts are investigated in this study: procurement innovation and procurement effectiveness. Before starting the investigation there is a need to define these concepts. Based on definitions, the main factors involved in the concepts will be identified. Definitions of “innovation” from different disciplines are found in literature:
economics, business, management, entrepreneurship, science, or technology [19]. There couldn’t be found a specific definition for procurement innovation. Nonetheless a multidisciplinary definition of innovation is available, that could be applied to any domain: *Innovation is the multi-stage process whereby organizations transform ideas into new products, services or processes in order to advance competition and differentiate themselves successfully in their market* [19] (p.1334).

The definition clearly underlines that innovation is a “multi-stage process” that must be well managed. As the definition suggests, the “ideas” are the first element involved in innovation. To be able to get innovative ideas, collaboration with consumers and suppliers is a very important factor. In innovative procurement the relationships with consumers and suppliers provide public managers with important knowledge that could be the engine of innovative ideas [20]. The second element present in the definition of innovation is the “new/improved product/service/process”. In order to be able to create something new, or to improve something that already exists, requires expertise and competence in that domain. Therefore, in the case of public procurement, procurement competence is an important factor of innovation 21. The third element of definition underlines the aim of innovation: the success through advancement, competition and differentiation. This is clearly a strategic aim, suggesting that strategic view is an important factor of innovation. Therefore for procurement innovation, strategic procurement is an important factor that must be considered [22]. There can be concluded, that according to the definition of innovation, three important factors are involved in the concept of procurement innovation: collaborative relationships, procurement competence and strategic procurement.

When investigating the definition of procurement effectiveness, no specific definition of effectiveness in procurement was found. Definitions from multiple areas (organization, strategic planning, leadership, education) underline the element of achieving the objectives: “the degree to which objectives are achieved and the extent to which targeted problems are solved In contrast to efficiency effectiveness is determined without reference to costs and hereas efficiency means doing the thing right effectiveness means doing the right thing” [23].

The definition of effectiveness clearly suggests that strategic planning is an important element of effectiveness. Therefore, in procurement effectiveness analysis, strategic procurement is an important factor that must be considered [24]. Additionally, in the scientific literature there are found argumentations, that procurement competence and collaborative relationships are also important factors that affect procurement effectiveness [24]. Based on the argumentations found in the literature review, in this study the effect of those three factors (collaborative relationships, procurement competence and procurement strategy) will be tested for both variables: procurement innovation, as well as procurement effectiveness. Moreover, has been argued that procurement innovation and procurement effectiveness have effect on each other [6]. This relationship will be investigated in the present study, as well. Based on the theoretical background the conceptual model and the hypothesis will be developed, further.

### 2.1. The relation of collaborative relationships with procurement innovation and procurement effectiveness

When the evaluation of procurement effectiveness is done, the following criterion are examined: the negotiated contracts have to meet the procurement needs, procured services have to meet the quality requirements, procurement did not exceed the given targeted costs and the procured service meets well the given specification [25]. Although the evaluation criterion are well known and specific attention has given to procurement competence, public procurement effectiveness has been emphasized as a big challenge in the last years. In the social and health care domain, the complex and interconnected problems related to public services make public procurement even more challenging [16]. The need of collaboration with suppliers, and with people from different sectors of activity, was never greater than now in the public procurement [26]. New innovative solutions that respond to challenges can be easier found when people with different expertise join their competences together [7].

The collaborative relationships with suppliers must be properly managed. First of all, a good information share system, as well as the feedback system between procurement organization and service suppliers have to be considered [27]. Furthermore, maintaining and developing good relationships with suppliers play a crucial role in procurement effectiveness [28]. Additionally, trust development between suppliers and procurement organization is very important, in order to develop strong relationships with suppliers [29].

In public procurement the innovative solutions are generally found in the early stage of procurement process, through an intensive collaboration with suppliers [30], [31]. Workshops with key suppliers can be organized in the early stage of procurement process to be able to find innovative procurement solutions [32]. Furthermore, collaboration is seen as an important factor when the aim is toward a more effective procurement [4]. Based on all these argumentations, the following hypotheses are posited:
ood collaborati e relationshi s  ith su liers and customers ha e a ositi e effect on ublic rocurement inno ations

ood collaborati e relationshi s  ith su liers and customers ha e a ositi e effect on ublic rocurement effecti eness

2.2 The relation of strategic procurement with procurement innovation and procurement effectiveness

Academics, practitioners and policy makers unanimously agree that public procurement has to be developed strategically in order to increase its effectiveness. Additionally public procurement has to become a strategic tool, when the aim is to a more sustainable procurement and to create value for all stakeholders involved in procurement process [33]. Strategic procurement means stepwise approaches towards long-term objectives [7]. It is argued, that strategic procurement plays an important role in value creation for customers, as well as in developing the value network with service suppliers [34]. Moreover, the organization’s success and procurement effectiveness can be achieved through strategic procurement [35].

Currently in public procurement the decisions are taken with a short-term reactive and tactical perspective, to comply with procurement law and to adapt to the competences of procurement managers, as well [7]. Long-term and clear objectives that are focused on innovative opportunities have to be established for a more sustainable and effective procurement [36]. Innovative solutions must be found continuously to be able to create value through public service procurement which assures an effective procurement. Therefore, the following hypotheses are stated:

Strategic de elo ment of ublic rocurement has a ositi e effect on ublic rocurement inno ation

Strategic de elo ment of ublic rocurement has a ositi e effect on ublic rocurement effecti eness

2.3. The relation of procurement competence with procurement innovation and procurement effectiveness

Procurement is not just a simple activity of purchasing items or services; it is a multifaceted process that includes many other process management functions, like business strategy, risk management, information technology and legal compliance. The coordination of all these activities requires strong skills and competences to be able to approach organizational needs and to achieve the procurement goals [4]. Procurement competence is a very important skill that procurement managers should own to assure an effective procurement. Inappropriate planning, inability to identify the priorities and goals, or under-spending of budgets are among the problems which induce to ineffective procurement 37. When recruiting new procurement personnel, their skills have to be consistent with the requirements found in the documentation regarding personnel skills. Furthermore, procurement staff competence has to be evaluated systematically and the staff requires continuous education, to update their professional skills 37.

Currently there is a lack of competence among public procurers. This also affects the innovativeness of public procurement [38], [39]. Procurers with a broader competence which are able to identify the long-term strategic goals use much easier the procurement function as a support and driver for innovations and value creation [7]. Accordingly, it is hypothesized that:

Procurement com etence of ublic rocurers influences ositi ely the inno ation in ublic rocurement

Procurement com etence of ublic rocurers influences ositi ely the ublic rocurement effecti eness

2.4. The relation of procurement innovation and procurement effectiveness

Earlier it was investigated how different factors (collaboration, strategy and competence) affect procurement innovation, as well procurement effectiveness. Now the aim is to search in the scientific literature argumentations about the relation between procurement innovation and procurement effectiveness. Innovation can have a great impact on the procurement effectiveness. Procurement innovations are achieved through the organization’s ability to create procurement entities which include elements of creativity and know how [6]. The way how procurement
criteria are chosen, or how the goals of procurement are presented, may increase considerably the innovativeness in public procurement. For example among the aims of organizations, one could focus on suppliers’ involvement in the improvement of service procurement description. New innovative ideas and innovations can be achieved using this as a procurement strategy. Suppliers which achieve this goal can be rewarded, or contrary, they may get some sanctions in case of failure[40]. This way of getting new innovations in public procurement has been proven to have a positive effect on procurement effectiveness continuously[6]. Therefore, according to these argumentations found in the scientific literature, the following hypothesis is posed:

7 Innovations in public procurement have a positive effect on public procurement effectiveness

In the next chapter, which contains the empirical part of the study, all the hypotheses posed above will be tested. First the sample and analysis method are described, followed by the conceptual model and the results of analysis.

Methods

3.1. Sample
Public procurement of health and social services has emerged in recent years in Finland. From public expenses, health and social services covered approximately 57 percent in 2011. At the annual level, the health and social service procurement is worth of 2 billion Euros and it covers more than 90 percent of public service procurement[41]. Service procurement has been seen as one way to guarantee the availability of services and reform the structure of health and social care.

The empirical evidence was gathered with a web survey. The target organizations were Finnish municipalities and public organizations responsible for providing health and social services. The organizations were at first contacted with telephone in order to reach a person that has experience or is responsible for service procurement. Altogether 216 persons were contacted in advance. The number of responses received was 58 after three rounds of reminders. This results a response rate of 26.7%.

3.2. Analysis method
Because the effective sample size was rather small, the selected analysis method was partial least squares structural (PLS) equation modeling, which is an appropriate analysis method for small samples[42]. After reviewing articles that applied PLS modeling, Reinartz, Haenlein and Henseler[43] suggested that PLS is an emerging methodological choice in quantitative research and is suitable for small samples and for models with latent variables having several indicators. PLS makes no parametric assumptions and is focused on the significance of the relationships between the dependent and independent variables instead of analyzing the overall model fit as in covariance-based structural equation modeling.

3.3. Measurement and research model
The research model with central concepts and the hypotheses is presented in figure 1. The concepts of collaborative relationships, strategic procurement, procurement competence, procurement innovation and procurement effectiveness were assumed to be measured with multi-item scales. Most of these measurement items included in the survey were derived from the previous literature and were modified to target the research objective of this study.

![Figure 1: The conceptual model](image)

The PLS method allows for the estimation of the confirmatory factor analysis and the structural relations simultaneously. In the evaluation of the measurement model, PLS estimates the internal consistency for each block
of indicators and evaluates the measurement reliability in terms of composite reliability and average variance extracted [44]. Table 1 contains descriptive statistics of the measurement items and the results of confirmatory factor analysis in terms of factors loadings and reliability coefficients.

### Table 1: Result of the confirmatory factor analysis

<table>
<thead>
<tr>
<th>Latent variable / Resource</th>
<th>Mean</th>
<th>SD</th>
<th>Item loading</th>
<th>CR</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>COLLABORATIVE RELATIONS IPS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information sharing and feedback with suppliers is spontaneous.[27]</td>
<td>5.127</td>
<td>.963</td>
<td>.871</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our organization has good relationships with suppliers.[28]</td>
<td>4.946</td>
<td>1.197</td>
<td>.849</td>
<td></td>
<td></td>
</tr>
<tr>
<td>We pursue trust development between suppliers.[29]</td>
<td>5.071</td>
<td>1.373</td>
<td>.736</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STRATEGIC PROCUREMENT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service procurement is part of organization's cont. development.[35]</td>
<td>4.259</td>
<td>1.358</td>
<td>.780</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service procurement contributes to the organization's success.[35]</td>
<td>4.983</td>
<td>1.207</td>
<td>.886</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service procurement adds value to end-customers.[34]</td>
<td>4.621</td>
<td>1.412</td>
<td>.911</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service proc. has important role in value network development.[34]</td>
<td>4.897</td>
<td>1.307</td>
<td>.903</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROCUREMENT COMPETENCE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The procurement staff skills are evaluated systematically.[37]</td>
<td>2.561</td>
<td>1.389</td>
<td>.797</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procurement capability of personnel is plotted and documented.[37]</td>
<td>2.421</td>
<td>1.451</td>
<td>.712</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procurement capability influence the effectiveness of procurement.[37]</td>
<td>3.054</td>
<td>1.949</td>
<td>.904</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continues education is required for procurement staff.[37]</td>
<td>3.589</td>
<td>1.876</td>
<td>.904</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROCUREMENT INNOVATION</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suppliers are involved in early stage of procurement for innovations.[35]</td>
<td>3.357</td>
<td>1.612</td>
<td>.905</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supplier innovativeness can be related in the cost of service.[29]</td>
<td>3.333</td>
<td>1.327</td>
<td>.933</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workshops with key suppliers are organized to find innovative solutions.[32]</td>
<td>2.737</td>
<td>1.458</td>
<td>.900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROCUREMENT EFFECTIVENESS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procured services meet well the given specifications.[25]</td>
<td>5.155</td>
<td>.988</td>
<td>.676</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procurement does not exceed the given target costs.[25]</td>
<td>4.544</td>
<td>1.351</td>
<td>.823</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procured services meet the quality requirements.[25]</td>
<td>4.825</td>
<td>1.020</td>
<td>.865</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negotiated contracts meet well the different procurement needs.[25]</td>
<td>4.789</td>
<td>1.191</td>
<td>.882</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The loadings produced with confirmatory factor analysis were all high (> .7) and statistically significant (p<.001), suggesting that the selected items measure the underlying constructs properly. The composite reliability (CR) coefficients were all higher than the general limit of .7 suggested in the literature [45]. The average variance extracted (AVE) was also used as an indicator of measurement reliability, and it should exceed .5 [46]. Table 2 includes the correlation between latent variables, where the diagonal represents the square root of the AVE. The discriminate validity of the measurement can be confirmed by computing the square roots of the AVE coefficient and comparing them with the latent variable correlations. The square root of AVE should produce higher values than the correlations, indicating that more variance is shared with the latent construct and its indicators than with other components that represent different blocks of indicators [47].

### Table 2: Correlations of the latent variables and the square root of the AVE scores on the diagonal

<table>
<thead>
<tr>
<th>Collaborative relationships</th>
<th>Strategic procurement</th>
<th>Procurement competence</th>
<th>Procurement innovation</th>
<th>Procurement effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaborative relationships</td>
<td>.21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic procurement</td>
<td>.412</td>
<td>.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procurement competence</td>
<td>.183</td>
<td>.442</td>
<td>.445</td>
<td>.91</td>
</tr>
<tr>
<td>Procurement innovation</td>
<td>.421</td>
<td>.195</td>
<td>.445</td>
<td>.91</td>
</tr>
<tr>
<td>Procurement effectiveness</td>
<td>.318</td>
<td>.512</td>
<td>.193</td>
<td>.326</td>
</tr>
</tbody>
</table>

Overall, when assessing the outer model (i.e., the measurement), it can be concluded that the measurement model meets the established criteria and suggests that further analysis can be conducted.
Results of the modeling

Table 3 gathers the results of the structural model with path coefficients and their significance. It also includes the R square of the dependent variables and summarizes the results of the hypotheses testing. The significance of the path coefficients was concluded based on t-statistics that were calculated with a bootstrapping method of 200 samples [48]. R squared is used as a measure that indicates how well the hypothesized model fits, and it is computed for each dependent variable.

Table  Results of the PLS path modeling

<table>
<thead>
<tr>
<th>Independent</th>
<th>Dependent</th>
<th>Path coefficient</th>
<th>p</th>
<th>Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaborative</td>
<td>Procurement innovation</td>
<td>0.410</td>
<td>**</td>
<td>H1: accepted</td>
</tr>
<tr>
<td>relationships</td>
<td>Procurement effectiveness</td>
<td>0.007</td>
<td>ns</td>
<td>H2: rejected</td>
</tr>
<tr>
<td>Strategic procurement</td>
<td>Procurement innovation</td>
<td>-0.172</td>
<td>ns</td>
<td>H3: rejected</td>
</tr>
<tr>
<td>Strategic procurement</td>
<td>Procurement effectiveness</td>
<td>0.528</td>
<td>***</td>
<td>H4: accepted</td>
</tr>
<tr>
<td>Procurement competence</td>
<td>Procurement innovation</td>
<td>0.447</td>
<td>**</td>
<td>H5: accepted</td>
</tr>
<tr>
<td>Procurement competence</td>
<td>Procurement effectiveness</td>
<td>-0.175</td>
<td>ns</td>
<td>H6: rejected</td>
</tr>
<tr>
<td>Procurement innovation</td>
<td>Procurement effectiveness</td>
<td>0.298</td>
<td>*</td>
<td>H7: accepted</td>
</tr>
</tbody>
</table>

** p < .001, *p < .01, ns = not significant

The R square for procurement innovation was .338 and for procurement effectiveness it was .336, thus a fair share of variance of the dependent concepts was explained by the modeling. Considering the research model and hypotheses, the first two discussed the role of collaborative relationships on procurement innovation (H1) and effectiveness. From these only the coefficient from collaborative relationships to procurement innovation was significant and positive as expected. This means that the more collaborative the relationship between service providers and purchasing organization leads to higher innovativeness in procurement. Considering strategic procurement, only the hypothesis H4 is accepted. A strategic orientation in procurement has a positive influence on procurement effectiveness. Hypotheses H5 and H6 discussed the influence of procurement competence. From these, H5 is accepted, thus procurement competence has a positive relationship with procurement innovation. The final hypothesis H7 is accepted procurement innovation facilitates procurement effectiveness.

Discussion and conclusions

The aim of this study was to investigate what factors affect the innovations and effectiveness of public procurement and what is the relation between procurement innovations and procurement effectiveness. Based on the literature review, three factors were identified as having influence on public procurement innovations and effectiveness: collaborative relationships, procurement strategy and procurement competence. All these three factors were considered in the analysis of this study.

As the results of this study show, strategic procurement has the strongest effect on the effectiveness of procurement. Furthermore, the strategic procurement is the only important factor that affects procurement effectiveness. Collaborative relationships and procurement competence don’t seem to have any significant effect on procurement effectiveness. On the other hand, collaborative relationships and procurement competence have important effect on procurement innovation, while strategic procurement doesn’t have any effect on procurement innovation. Moreover, the study indicates that procurement innovation affect positively procurement effectiveness, even if the relation between them is not very strong.

As stated earlier, strategic procurement showed the strongest positive influence on procurement effectiveness. This is in line with the previous research which emphasizes the strategic role of procurement when the aim is to a more effective public procurement [33]. This means that in order to enhance the effectiveness of procurement, much more attention should be given to procurement strategy. This implies long-term objectives [7] which focus on creating value to end customers and enhancing the value network of all stakeholders involved in procurement process [34]. This way the success of procurement can be achieved [35]. Even if in the recent years strategic procurement has been emphasized as an important procurement function, too little attention has given in practice to it. Currently, procurement specifications focus mainly on criteria based on the lowest cost. In the future procurement criteria should focus on long-term objectives, especially on the impact the public services should produce on customers and tax payers [49].
Contrary to studies found in the literature review, the results of this study suggest that collaborative relationships and procurement competence don’t have significant effect on procurement effectiveness. According to Sciele and McCue [4], procurers need strong procurement skills to be able to coordinate all the procurement activities and to achieve and to achieve the goals of the procurement. This suggests that procurement competence is strongly related to procurement strategy competence. The results of this study can be interpreted so, that procurement competence, as a standalone factor, has not much influence on procurement effectiveness, but just in connection with the strategic planning of procurement (strategic procurement), which has a much stronger effect on procurement effectiveness.

Similarly, this study suggests that collaborative relationships, as a standalone factor, has no significant influence on procurement effectiveness, but just in connection with strategic procurement. If collaborative relationship management is part of procurement strategic planning, can be assured an effective procurement, as Carr and Smeber argue [28]. However, more research is needed to investigate if in other contexts, the results will be the same. In Finland innovation and collaboration are usually parts of strategic planning in the most organizations [49]. New research is needed in countries were innovation don’t play an important role in strategic planning.

The second investigation made in this study was on the effect of collaborative relationships, strategic procurement and procurement performance on procurement innovation. As stated earlier, this study shows that collaborative relationships and procurement competence have positive effect on innovation, while strategic procurement doesn’t have any significant effect on it. As Seuring and Muller suggest [36], strategic procurement should focus on innovative opportunities in public procurement. However, no other evidence was found in the literature, regarding the effect of strategic procurement on procurement innovation. More studies are required to replicate the results of the present study.

This study also showed the positive effect procurement innovation has on procurement effectiveness, even though the relation is not very strong. Innovations are known as unique and intelligent solutions to different kind of challenges [49]. In this study innovations were broadly approached as a general solution to enhance the effectiveness of public procurement. However, procurement innovations involve different changes in product, processes, or services. These are namely different types of innovations. Further, the aim of innovation is either to reduce cost, or to improve the effectiveness [50]. More study is required to investigate what kinds of innovations have a stronger effect on procurement effectiveness.

5.1. Theoretical implications

Even though in this study it was hypothesized that collaborative relationships and procurement competence have direct implications in increasing procurement effectiveness (based on some argumentations found in literature review) [28], [37] this study strength the definition of effectiveness [23] , where it is suggested that only strategic objectives are important for the effectiveness of procurement.

Another important finding which has theoretical implication is related to the definition of innovation. Based on the multidisciplinary definition of innovation found in the scientific literature [19], (which suggests that the main factors that are involved in innovations are related to collaboration, competence and strategy), it can be argued that the results of this study didn’t found any statistical significance between procurement strategy and innovation. It can be concluded, that in the case of public procurement, the only factors that have strong influence on innovations are the collaborative relationships and procurement competence. However, replication of this study is required in order to validate the findings of this study.

5.2. Managerial implications

The present study has managerial implications, as well. First of all, as a general implication can be specified that based on the results of this study, public managers can understand which issues must be emphasized when the aim is get more innovations in public procurement and make procurement process more effective. The main lesson learned here is that the most important factor that affects the effectiveness of public procurement is the strategic planning of procurement. Understanding the importance of strategic procurement and its role in enhancing the effectiveness of procurement, may have important implications in the organization of the whole procurement process.

The second important managerial implication of this study is related to procurement innovations. The study shows that collaborative relationships and procurement competence have crucial roles in procurement innovations. Understanding the importance of developing and maintaining good relationships with suppliers and customers, as well as developing trusted relationships with all the stakeholders involved in public procurement process, more
innovations can be acquired in the public procurement domain. Based on this study, the public managers can understand the emerging need to move to a more collaborative procurement. The time of procurement based on competition has enriched its limits. In a world where the public challenges are increasing continuously, collaboration has to take place of competition. No one organization has sufficient expertise to solve complex challenges encountered in the modern society [26]. New intelligent solutions, which include information from many domains, are required continuously. New innovations can be achieved through a wide and intensive collaboration, which includes not only experts, but customers and tax payers, as well.

It was also found in this study that procurement competence has an important effect on procurement innovation. A managerial implication of the findings of this study is that educating and training public purchasers may play an important role in increasing innovations in public procurement. The procurement management competence should be a priority when recruiting new procurers, as well as maintaining and updating their competence through a continuous education. Furthermore, the procurers must be aware of the role innovations play in procurement effectiveness. They must accept that the procurement process can be organized in different and new ways, which can provide greater effectiveness of the hole procurement process. Even if the effect of innovations on the effectiveness of procurement cannot be evaluated beforehand, performance measurement must be periodically done in order to find which the most effective innovations are, or which are more costly [15].

5.3. Limitations and further research

As all quantitative research, the present study has some limitations related to this issue, too. The results of the empirical analysis of the survey data are indicative due to the small amount of available data. Challenge faced by this type of study, is the motivation of the personnel that operates in the public domain. However, the validation of the measurement was rather convincing, as the central concepts were measured with indicators used in previous research. The validation of the research model could benefit from further research with higher statistical power. If considering the area of the research more widely, not only at the national level, the issues of procurement competence and collaborative relationships and their effect on procurement effectiveness should be further investigate. Additionally, as in Finland innovation and collaboration are usually parts of strategic planning in the most organizations [49], new research is needed in countries where innovation don’t play an important role in strategic planning. Future research might include other samples from other countries or regions, to test if strategy has/doesn’t have effect on innovation. Additionally, must be tested if competence and collaboration have/don’t have effect on effectiveness.

Moreover, as it was stated earlier that no other evidence was found in the literature, regarding the effect of strategic procurement on procurement innovation. More studies are required to replicate the results of the present study. Furthermore, this study indicates that innovations have a positive effect on procurement effectiveness, but the effect is not very strong. More study is required to investigate what kinds of innovations have a stronger effect on procurement effectiveness.

References


THE EFFECTIVENESS OF SIMPLE HOMOGENEOUS COMMODITY PROCUREMENT UNDER RIGID GOVERMENTAL REGULATION: THE CASE OF GRANULATED SUGAR PROCUREMENT IN RUSSIA

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National Research University Higher School of Economics

In the 2000s the Russian government considered electronic auctions (e-auctions) as the best way to procure goods for public needs. In this paper we confirm this proposition using an empirical dataset of contracts for the procurement of granulated sugar in Russia in 2011. Our data shows that unit prices are higher in the case of long-term contracts. This result can be explained by the rigidity of public procurement regulations in Russia. Under these conditions suppliers can participate in public procurement tenders for long-term contracts only if their price includes a “risk premium” covering additional expenses of the supplier in case of an unfavorable turn in the market. Our analysis shows that sugar prices in Russian public procurement are lower for contracts with higher volume. The influence of competition measured by the number of suppliers participating in the procurement procedure has a quadratic form: the effect of a new participant is lower when number of competitors is higher and vice versa. Our analysis also shows that there are essential distinctions in the influence of the same factors on contract prices for competitive procedures and void auctions.

JEL Classification: H57, P35. **Key words:** public procurement, e-auctions, procurement effectiveness, Russia, procurement procedures, granulated sugar.

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Introduction

Public procurement accounts for a considerable part of the budget of most countries. The choice of optimal public procurement methods is a matter of particular importance, as more effective procurement saves a significant amount of public funds.

Both researchers and politicians share the prevailing opinion that electronic auctions (e-auctions) could become such a procedure. In particular, Ageshin (2001) states that due to greater transparency and the low cost of obtaining information, this procurement method brings about near perfect competition and, consequently, ensures the procurement of better goods and services at lower prices.

However, from the point of view of institutional economy and the theory of contracts, the choice of suppliers through e-auctions for complex or package procurements may generate the effect of “negative selection,” as in the absence of filters based on business reputation and insufficiently competent qualification assessment or unscrupulous executors offering knock-down prices for the sake of gaining a contract would end up as the auction winners. Nevertheless, in cases of simple and homogeneous products, the qualitative characteristics of which can be easily set out in the tender documentation and verified at the point of delivery, e-auctions can be considered the most effective procurement method. This is precisely the case described in this paper.

The purpose of this survey is to analyze the factors influencing the price effectiveness of the procurement of a simple homogeneous product, using the example of granulated sugar procurement in Russia. In this work, price effectiveness is measured using three indicators. In our opinion, a more effective auction results in lower prices, greater price reductions and a larger difference between regional retail and contract price (if the contract price is lower than the regional price).

In addition, we establish that e-auctions ensure better price effectiveness in comparison with other procurement methods. The availability of statistics on regional retail prices will also allow us to compare the prices of the contracts for the supply of granulated sugar with retail prices in considered regions.

The article is structured in the following way: section 1 offers an overview of previous research on the subject, section 2 formulates the hypotheses to be tested, section 3 describes the market of public procurement of granulated sugar and the available data, section 4 presents the

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1 According to the Nelson-Darby-Karni classification, they may be referred to the category of “experience” and “credence” goods. See Nelson (1970), Darby & Karni (1973), and Tirole (1988).
2 The Nelson-Darby-Karni classification refers such products to the category of “search” goods.
testing methods of the hypotheses and their results, and section 5 contains the main conclusions and economic policy recommendations.

1. Literature Survey

There are two aspects in examining the placement of contracts. The first involves effectiveness analysis of various procurement procedures in terms of procurement and transaction costs for the buyer. The second analyses the errors that may occur during the placement of a contract both due to corruption and collusion and as the result of external factors such as political pressure.

There is no unequivocal answer to the question which is more effective: public procurement via e-auctions or negotiations with individual suppliers. Vellez (2011) shows that auctions in the medical technology market in Italy do not necessarily result in a greater price reduction than negotiations. However, Lalive and Schmutzler (2011) demonstrate that the prices under contracts concluded through auctions in the German railway construction market were lower. Such a difference may be connected with the specific characteristics of the markets under survey. In this context, it would be interesting to check whether auctions would lead to a reduction in procurement prices of granulated sugar in Russia.

MacDonald, Handy and Plato (2002) compare the prices in the private sector with the prices in auctions held by the United States Department of Agriculture (USDA) and conclude that the typical wholesale price of comparable goods exceeds the price of contract. In addition, they discovered a nonlinear relation between the number of auction participants and the contract price: the marginal effect of an additional supplier joining the bid is low if the number of participants is large and high if the number of participants is small, but in both cases this effect is significant.

In a separate group of studies on e-auctions, this method is considered to be more transparent, open and, consequently, ensures greater competition, which ultimately leads to a price reduction. Soudry (2004) has demonstrated that British e-auctions ensure better results than the first price auctions for products easily describable in quantitative terms. He also notes, however, that this type of auction is more sensitive to collusion, especially with recurrent interactions between the buyer and the suppliers. Singer, Roubik and Beffermann (2009) make a quantitative evaluation of the consequences of the transition to an e-procurement system in Chile. This transition resulted in a 0.28%–0.38% cut in administrative outlays and a 2.65% reduction in procurement prices. Pavel and Šišková-Beblavá (2013) show that e-auctions lead to an increase
in competition among the bidders and, as a consequence, to lower prices. The authors explain this effect by the relatively easy participation in such auctions and their greater transparency.

However, Vaidya, Sajeev and Callender (2006) point out that the transition to e-procurement does not always have favourable consequences, but involves considerable financial and time expenditure. The transition to more transparent procurement methods can be explained by political considerations. For example, Moszoro and Spiller (2012) show that if there is a potential risk of accusations of corruption, public officials may prefer using strictly formalised and economically less effective procurement procedures. Chong, Staropoli and Yvrande-Billon (2009) demonstrate that the choice of auctions as the predominant method of contracting as compared to negotiations is connected, inter alia, with political motives.

An important factor that should be taken into account when evaluating the effectiveness of auctions, including electronic ones, is the possibility of corruption and collusion. Li and Zheng (2009) note that their conclusion regarding less aggressive competition at an auction following an increase in the number of bidders could change if the possibility of collusion is included in the model. A number of surveys (Chever & Moore (2012), Porter & Zona (1993, 1997)) show the presence of collusion in contract markets. Podkolzina and Morozov (2012) demonstrate the presence of collusion between suppliers in the road construction markets in one Russian region as a result of which competition was actually brought to naught despite nominal participation of several bidders in the procurement procedure.

The active reform process of the public procurement sector in Russia has sparked the interest of the academic community. Yakovlev, Demidova and Balaeva (2012) use the case of a major state-funded organisation to demonstrate that problems with the fulfilment of contractual obligations occur more frequently under contracts concluded through auctions, especially large contracts. Balsevich, Pivovarova and Podkolzina (2012) demonstrate, using information on procurement in ten Russian regions, that the prices of gasoline under contracts are lower if there is a greater level of information transparency, even without a considerable increase in competition.

This paper in some of its methodological aspects builds on the previous Russian studies. At the same time, its novelty lies in the analysis of the price effectiveness of e-auctions on the basis of national Russian data on the procurement of a simple, homogeneous and staple commodity.
2. Hypotheses

This work analyses the influence of the procurement method on its effectiveness. It also tests a number of auxiliary hypotheses:

**Hypothesis 1.** Using valid e-auctions results in a greater price reductions compared to other procurement methods.

**Hypothesis 2.** An increase in the number of auction participants leads to more effective procurement. The effect may be nonlinear.

**Hypothesis 3.** For larger contracts the prices per kg (of sugar) are lower.

**Hypothesis 4.** For longer terms contracts the prices per kg (of sugar) are higher.

As far as the first hypothesis is concerned, in single-source procurements and procurements based on the results of void auctions no considerable price reduction is to be expected. Requests for quotations, theoretically, should lead to smaller price reductions than valid auctions, as quotations are intended for the procurement of smaller volumes of goods due to the specifics of the Russian legislation. E-auctions also open access to participation in procurements for more suppliers.

The second hypothesis follows previous studies (Pavel & Sičáková-Beblavá (2013), Gomez-Lobo & Szymanski (2001)). The assumption that with a relatively larger number of bidders the marginal effect of appearance of a new competitor would be lower than in a situation with a small number of competitors also is logical. As mentioned above, this effect was seen in the US food procurement market (MacDonald, Handy & Plato (2002)).

An increase in the contract volume, hypothesis 3, should lead to a reduction of the unit price of the procured goods. This is what happens in normal markets. It is sufficient to compare the retail and wholesale prices of any product, including sugar, to see that this is so. Chever, Saussier and Yvrande-Billon (2012) demonstrate that this pattern should persist, inter alia, in the market of contracts.

According to the Russian law, the price of a contract cannot be changed in the process of its execution (except contracts on fulfillment of certain jobs), therefore, in the event of an increase of free market prices the supplier is liable for losses. To compensate for such risks, suppliers will agree to conclude long-term contracts only if the prices are higher (Chever, Saussier & Yvrande-Billon (2012)), which leads us to the formulation of the fourth hypothesis.

The four hypotheses concern the impact of various factors on price effectiveness in public procurement. We also take into account the fact that the same factors can have a different influence on prices for contracts placed through different procurement procedures. We test this
hypothesis using a test similar to the Chow test, which compares coefficients for the same factors in the models estimated separately for different groups of contracts.

3. Data Description

3.1 General Characteristics of the Sugar Market in the Russian Federation

Granulated sugar production and consumption have a strong seasonal pattern. Production of sugar beet is generally from September to November, and the production of raw sugar from March to July. Consumption usually peaks in July. Domestic prices depend on supplies of cheaper imported sugar.

During the past several years, the retail price of granulated sugar in the Russian market varied from 21.3 rub/kg in April–May 2007 to 44.3 rub/kg in February–March 2011. During 2011, the price dropped by nearly 30% (see Fig. 1) owing to a record-breaking harvest of sugar beet. The average retail mark-up on wholesale prices in Russia is 25–30%. A batch of sugar exceeding 20 tonnes is generally considered a wholesale shipment.

Figure 1. Dynamics of Average Wholesale and Retail Prices of Sugar during the Period from December 2010 to December 2011

Source: Rosstat, Average weekly retail prices of some goods and services; Sugar Monitoring ISCO-I

Retail prices of granulated sugar vary quite significantly across the regions of Russia. The lowest levels are registered in the federal districts where the largest sugar manufacturing

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1 The authors express their acknowledgements to Nina Yershova whose materials were used for writing this section.
companies are situated. In the Far Eastern District, which is the farthest from the places of sugar production, sugar prices in 2011 were 60% higher.

The sugar market is highly concentrated. The share of the three largest manufacturing companies is nearly 50%. Most of the national demand for sugar in Russia comes from retail consumers (approximately 50%), the food industry (about 40%), as well as hotels and public catering enterprises (7%). Public procurement accounts for 0.5% of the overall sugar sales in the Russian market.

3.2 Sampling Specifics

This work uses data on simple contracts for the procurement of sugar concluded in the period from 1 January 2011 to 31 December 2011 provided by the Unified Register of Federal and Municipal Contracts. This data contains all contracts concluded in the Russian Federation during that period where granulated sugar is the only supply item, and represents a continuous sample.

Data on 2,975 contracts were taken from the Register, but not all entries contained complete information on the stages of the contract placement and fulfillment. In particular, in some cases the information on the amount ordered, the starting price, the number of auction participants was missing.

After excluding files with data gaps we were left with 2,720 contracts (over 90% of the initial sample) for an overall volume of 11,300 tonnes at approximately 450 million rubles.

Following the analysis of price reductions achieved in the process of auctions, single-source contracts and contracts concluded through void auctions were also removed from the sample. The final sample for assessment was 2,323 contracts for 5,100 tonnes at 173 million rubles.

3.3 Public Procurement Effectiveness Characteristics

We will consider the following public procurement effectiveness characteristics: price per kilo, the price reduction during the auction compared to the starting (maximum) price, and deviation of the contract price from the average retail price in the region, to which the buyer belongs. The main descriptive characteristics are presented in Appendix 1. To exclude the impact of general market fluctuations, all prices were standardized on the basis of the average price of granulated sugar in Russia at the moment of summing up of the procurement procedure results. The average proportion of the price of sugar under contracts to the average retail price across Russia was approximately 0.9.

To analyze the effectiveness of the procurement process, we reviewed the differences between four types of contracts: single-source contracts, requests for quotations, e-auctions, and void e-auctions (when there was only one participant). As a rule, there is no price reduction for
single-source procurement or contracts based on a void e-auctions. For requests for quotations, the price decreased by 13% on average, and for valid e-auctions by 9%.

At first glance, the group of single-source contracts and contracts placed through void e-auction are similar, because in both cases the order is placed without bidding. However in single-source contracts the buyer decides to restrict competition while initially void e-auctions supposed to be competitive procedures. It may be a legitimate question about the appropriateness of allocating a separate group to requests for quotations with one only participant. However, preliminary analysis shows that there is no significant difference between requests for quotations with one, and more than one participant.

The comparison of the price of one kilogram of sugar under a contract with the weekly average retail price of sugar in the region of the buyer’s location at the moment of the contract placement shows that in 83% of all cases the contract price of one kilogram of sugar is lower than the average in the relevant region of Russia.

3.4 Other Characteristics of Contracts

A considerable part of the sample (97%) consists of relatively small contracts (less than 20 000 kg). Nevertheless, they account for only 37% of the total procurement volume. At the same time, we can see from Table P1 in the appendix that the bulk of the sample consists of small contracts (up to 100 000 rubles)\(^1\). On average, the decrease of the contract price per kilogram decline together with the size of the contract, the average contract price per kilogram grows as well.

Contracts placed by different methods differ both in price and in volume (see Table P2). Prices are lower and the price decrease and its deviation from the regional average is greater for contracts placed through requests for quotations. Sugar prices under single-source contracts have the least deviation from the regional average. In addition, although such contracts are relatively few in quantitative terms, they account for a considerable share of the total procurement volumes both in kind and in cost.

The average contractual period is approximately 125 days (see Table P3). Contracts with supply terms exceeding 200 days are on average more expensive than shorter-term contracts but the volumes of supply under the former are larger. At the same time, the size of the price decrease diminishes as the contract period becomes longer and the contract price per kilogram grows.

Single-source contracts significantly differ from contracts awarded by other methods in terms of volume, price, and length (see Table 1). This suggests the heterogeneity of the market

\(^1\) According to Federal Law 94-FL, procurements to the sum less than 100 000 rubles in 2011 could be made without an auction (against an invoice of a single supplier).
and that the choice of procurement method could be based not only on the effectiveness comparison for procedures, but on other considerations. Unfortunately, the available data do not allow us to provide an analysis of this group of contracts to identify buyer incentives. Taking this into account we exclude from the further analysis single-source contracts.

Table 1. Characteristics of contracts.

<table>
<thead>
<tr>
<th>Type of procurement</th>
<th>Contract price (rubles)</th>
<th>Contract volume (kg)</th>
<th>Starting (maximum) sugar price (rubles/kg)</th>
<th>Contract sugar price (rubles/kg)</th>
<th>Term of delivery (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-source</td>
<td>3 126 378</td>
<td>69 721</td>
<td>44,28</td>
<td>43,36</td>
<td>238</td>
</tr>
<tr>
<td>Void e-auction</td>
<td>65 904,31</td>
<td>1 734</td>
<td>37,87</td>
<td>37,84</td>
<td>151</td>
</tr>
<tr>
<td>E-auction</td>
<td>92 141,26</td>
<td>2 615</td>
<td>36,52</td>
<td>32,77</td>
<td>142</td>
</tr>
<tr>
<td>Request for quotation</td>
<td>63 851,12</td>
<td>1 931</td>
<td>39,04</td>
<td>33,61</td>
<td>104</td>
</tr>
</tbody>
</table>

In addition, we exclude from the analysis contracts with a price higher than 500 000 rubles, because procedures may be used only for contracts with lower price according to the law. Furthermore, as can be seen from the descriptive statistics (see Appendix 1) contracts are not homogeneous in terms of volume and price. There are contracts of small volumes (18-20kg) and a very large (up to 350t). The exclusion of the largest contracts helps to mitigate this heterogeneity.

4. Modeling the Effectiveness of Contract Placement

4.1 Choice of Models

This work analyses contract placement effectiveness indicators which are continuous variables, and using the least-squares method we evaluate the impact of various factors on the characteristics of the contracts. Because of the possible heteroscedasticity we use robust estimates for the covariance matrix of coefficients.

The following variables will be regarded as dependent variables:

- the contract price standardized on the basis of the average price in Russia at the moment of the contract placement;
- the decrease of the price of one kilogram of sugar in the process of the contract placement (as portion of the standardized starting (maximum) contract price;
• the deviation of the contract price from the average retail price in the region at the moment of the contract placement (as portion of the standardized regional retail price).

All models wherever possible use the following regressors: the contract volume (in kilograms or as a dummy variable for the contract value), scheduled contract execution period (in days), the number of participants in the procurement procedure, the average regional price of one kilogram of sugar at the moment of the contract placement standardized on the basis of the average price of sugar in Russia at the same moment. We include control variables in all models in the form of sets of dummy variables coupled with the contract placement month.

We check whether the influence of the same factors on the price performance of the contract is the same for different procurement methods. We add dummy variables to the models for procurement methods (e-auction is the base category) and their cross-products with all other covariates. Then we check them for joint significance. In fact, this test is an analogue of the Chow test. In the case of significant differences in the impact of factors for different types of procedures we estimate models separately for every procurement method. We also include the number of participants as covariates.

4.2 Hypotheses Testing Results

After removing from consideration contracts worth more than 500,000 rubles and single-source contracts, there are 2,609 observations in the data set, of which 1,460 contracts were placed by a request for quotations, 839 by the e-auction and 310 by void e-auction. Firstly, we verify whether all the data can be included in one model. To do this, we use the previously described procedure: including dummy variables and their cross-products with other covariates in the model to test the hypothesis that there are significant differences in the coefficients of all regressors for e-auctions and other procurement methods. Test results are shown in Table 2. Hypotheses about the same influence of the factors included in the models are rejected at any reasonable level of significance. Consequently, it is necessary to evaluate independent models for each of the procurement methods. We also include the number of participants in the models for e-auctions and requests for quotation, and we assume a quadratic dependence on this regressor, which is consistent with the assumption of a decreasing effect on the growth of the level of competition, confirmed previous studies (Pavel & Šičáková-Beblavá (2013), Gomez - Lobo & Szymanski (2001)).

Table 2 also shows the coefficients for the dummy variables for the differentiation of procurement method (the void e-auctions or requests for quotations) from e-auctions. To avoid the problem of multicollinearity and to improve the effectiveness of estimates we test hypotheses about the joint significance of coefficient groups and exclude them from the model in case of insignificance. According to Table 2 there is a significant difference in the price characteristics
for contracts placed using different procurement methods, compared with e-auctions the sugar price is higher for requests for quotations and void e-auctions.

Table 2. The results of the Chow test analogue. a)

<table>
<thead>
<tr>
<th>Model</th>
<th>Contract price of one kilogram of sugar</th>
<th>Price reduction</th>
<th>Price deviation from regional price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E-auction and void e-auction</td>
<td>E-auction and request for quotation</td>
<td>E-auction and request for quotation</td>
</tr>
<tr>
<td></td>
<td>Test</td>
<td>11.72***</td>
<td>6.60***</td>
</tr>
<tr>
<td></td>
<td>Dummy coefficient b)</td>
<td>-0.453***</td>
<td>0.062***</td>
</tr>
<tr>
<td></td>
<td>Test</td>
<td>12.77***</td>
<td>7.39***</td>
</tr>
<tr>
<td></td>
<td>Dummy coefficient b)</td>
<td>-0.469***</td>
<td>0.051*</td>
</tr>
</tbody>
</table>

a) *** null hypothesis rejected at 0.01 significance level, ** null hypothesis rejected at 0.05 significance level, * null hypothesis rejected at 0.1 significance level  

b) Dummy for procurement procedure type

Let us consider the factors influencing the contract price of one kilogram of sugar. The results of assessment of various specifications of relevant models are presented in Table 3. For e-auctions and requests for quotations, increases in the contract volume lead to lower prices (though this effect disappears in the model with a dummy variable for belonging to different groups of value instead of volume in kilograms). For void e-auctions volume has no significant influence on the price. The duration of the contract is significant in five of the six estimated models, and for e-auctions the growth of contract the price increases, while for contracts placed by void e-auctions the price decreases. This may be due to the absence of competition in e-auctions, but additional research is necessary to verify this hypothesis. At the same time, for requests for quotations the coefficient of the corresponding regressor is significant only at a significance level of 0.1, and only in the specification of the model with the contract volume as a covariate.

The number of participants in the procurement procedure has a significant impact on the price. Results do not allow the rejection of the hypothesis of non-linearity of this effect for requests for quotations in both versions of the model specification (with the amount of the
contract in physical and monetary terms) and for e-auctions in the model with the contract volume in terms of money. The retail regional sugar price has a positive effect on the procurement sugar price in all the models.

<table>
<thead>
<tr>
<th>Regressors</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E-auction</td>
<td>Void e-auction</td>
<td>Request for quotation</td>
<td>E-auction</td>
<td>Void e-auction</td>
<td>Request for quotation</td>
</tr>
<tr>
<td>Contract volume (kg)</td>
<td>-1,15e-05***</td>
<td>1,60e-06</td>
<td>-8,11e-06***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2,72e-06)</td>
<td>(5,07e-06)</td>
<td>(1,56e-06)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of participants</td>
<td>-0,025***</td>
<td>-0,035***</td>
<td>-0,021*</td>
<td>-0,037***</td>
<td>(0,009)</td>
<td>(0,012)</td>
</tr>
<tr>
<td></td>
<td>(0,010)</td>
<td>(0,009)</td>
<td>(0,012)</td>
<td>(0,009)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Squared number of participants</td>
<td>0,003***</td>
<td>0,003***</td>
<td>0,002</td>
<td>0,002**</td>
<td>(0,001)</td>
<td>(0,001)</td>
</tr>
<tr>
<td></td>
<td>(0,001)</td>
<td>(0,001)</td>
<td>(0,001)</td>
<td>(0,001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contract duration</td>
<td>2,49 e-04***</td>
<td>-2,82 e-04**</td>
<td>7,99e-05*</td>
<td>2,37 e-04***</td>
<td>-2,784 e-04**</td>
<td>5,63e-05</td>
</tr>
<tr>
<td></td>
<td>(6,39e-05)</td>
<td>(1,197 e-04)</td>
<td>(4,46e-05)</td>
<td>(6,56e-05)</td>
<td>(1,17 e-04)</td>
<td>(4,54e-05)</td>
</tr>
<tr>
<td>Standardized average regional</td>
<td>0,412***</td>
<td>0,969***</td>
<td>0,446***</td>
<td>0,385***</td>
<td>0,960***</td>
<td>0,439***</td>
</tr>
<tr>
<td>price</td>
<td>(0,052)</td>
<td>(0,143)</td>
<td>(0,036)</td>
<td>(0,055)</td>
<td>(0,1382375)</td>
<td>(0,036)</td>
</tr>
<tr>
<td>Dummies for a month</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Contract value from 100 to 500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>thousands rubles^4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0,007</td>
<td>0,017</td>
<td>-0,003</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0,020)</td>
<td>(0,023)</td>
<td>(0,009)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0,474***</td>
<td>-0,156</td>
<td>0,532***</td>
<td>0,489***</td>
<td>-0,011</td>
<td>0,534***</td>
</tr>
<tr>
<td></td>
<td>(0,052)</td>
<td>(0,137)</td>
<td>(0,037)</td>
<td>(0,056)</td>
<td>(0,130)</td>
<td>(0,038)</td>
</tr>
<tr>
<td>Number of observations</td>
<td>839</td>
<td>310</td>
<td>1 460</td>
<td>839</td>
<td>310</td>
<td>1 460</td>
</tr>
<tr>
<td>R^2</td>
<td>0,469</td>
<td>0,774</td>
<td>0,211</td>
<td>0,454</td>
<td>0,776</td>
<td>0,200</td>
</tr>
</tbody>
</table>

a) * significant at 0,01; ** significant at 0,05; *** significant at 0,1
b) the robust standard errors of the coefficients are in brackets
c) dummy variable

Table 4 presents the results of the modeling of the contract price reduction compared to the starting (maximum) price. The volume of the contract has a significant influence on price reduction. In the models with dummy variables for contract value, the influence of the contract value is significant only in the models for requests for quotations. For e-auctions there is a significant positive influence of contract volume. For requests for quotations there is a negative influence. Contract duration also has a significant impact on the size of the price reduction, for requests for quotations an increase in duration leads to a bigger price reduction, for e-auctions, it lowers the price decrease. The number of bidders has a significant influence on the magnitude of
the price reduction, and in this case, the hypothesis of non-linear relationship between the size of the price reduction and the number of bidders cannot be rejected.

In regions with higher average retail prices, the price reduction is greater for e-auctions. This can be explained by the fact that in regions with higher retail prices, participation in public procurement can be more attractive for suppliers. However, for requests for quotations the average retail price has no significant influence on the price reduction.

Table 4. Factors influencing the contract price decrease of one kilo of sugar (as %) (exclusive of single-source contracts and void auction contracts)\(^\text{a, b}\)

<table>
<thead>
<tr>
<th>Regressors</th>
<th>(1) E-auction</th>
<th>(2) Request for quotation</th>
<th>(3) E-auction</th>
<th>(4) Request for quotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract volume (kg)</td>
<td>8.58e-06***</td>
<td>-4.13e-06***</td>
<td>0.049***</td>
<td>0.045***</td>
</tr>
<tr>
<td></td>
<td>(2.62e-06)</td>
<td>(1.04e-06)</td>
<td>(0.008)</td>
<td>(0.006)</td>
</tr>
<tr>
<td>Number of participants</td>
<td>0.052***</td>
<td>0.045***</td>
<td>0.049***</td>
<td>0.045***</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.006)</td>
<td>(0.008)</td>
<td>(0.006)</td>
</tr>
<tr>
<td>Squared number of participants</td>
<td>-0.003***</td>
<td>-0.003***</td>
<td>-0.003***</td>
<td>-2.65 e-04***</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Contract duration</td>
<td>-1.94 e-04***</td>
<td>6.74e-05**</td>
<td>-1.86 e-04**</td>
<td>6.57e-05**</td>
</tr>
<tr>
<td></td>
<td>(5.30e-05)</td>
<td>(3.07e-05)</td>
<td>(5.36e-05)</td>
<td>(3.10e-05)</td>
</tr>
<tr>
<td>Standardized average regional price</td>
<td>0.227***</td>
<td>0.010</td>
<td>0.244***</td>
<td>0.013</td>
</tr>
<tr>
<td></td>
<td>(0.031)</td>
<td>(0.020)</td>
<td>(0.030)</td>
<td>(0.020)</td>
</tr>
<tr>
<td>Dummies for month</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Contract value from 100 to 500 thousands rubles(^\text{c})</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.014</td>
<td>0.001</td>
<td>-0.023***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.014)</td>
<td>(0.005)</td>
<td>(0.005)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-0.243***</td>
<td>0.042*</td>
<td>-0.251***</td>
<td>0.035</td>
</tr>
<tr>
<td></td>
<td>(0.032)</td>
<td>(0.024)</td>
<td>(0.032)</td>
<td>(0.025)</td>
</tr>
<tr>
<td>Number of observations</td>
<td>839</td>
<td>1 460</td>
<td>839</td>
<td>1 460</td>
</tr>
<tr>
<td>R2</td>
<td>0.364</td>
<td>0.276</td>
<td>0.350</td>
<td>0.278</td>
</tr>
</tbody>
</table>

a) * significant at 0.01; ** significant at 0.05; *** significant at 0.1
b) the robust standard errors of the coefficients in brackets
c) dummy variable

The results of the modeling of the difference between the contract price and the average retail price in the region are presented in Table 5. The contract volume in this case influences the price difference only for e-auctions and requests for quotations and the value of contract does not have an impact on the price deviation. Higher contract volume leads to an increase of the price difference. For long-term contracts, prices are closer to the average regional price if the contract was placed through e-auctions or requests for quotations. The number of participants in the procurement procedure has a non-linear influence on the size of the deviation from the average regional prices only for requests for quotations. For e-auctions the number of participants in the procedure is significant and its square only for the volume of contract. For models with contract value as a regressor, only the number of participants is significant.
The influence of the average retail regional price on the contract price is important for e-auctions and requests for quotations, and in both cases, the procurement price is lower in comparison with regional price and is greater in regions with higher retail prices.

### Table 5. Factors influencing the difference between the average regional price and the contract price of one kilo of sugar (as %)\(^{(a)}\)

<table>
<thead>
<tr>
<th>Regressors</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-auction</td>
<td>0.022</td>
<td>0.034</td>
<td>0.019</td>
<td>0.036</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Void e-auction</td>
<td>0.010</td>
<td>0.009</td>
<td>0.011</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Request for quotation</td>
<td>-0.002</td>
<td>-0.002</td>
<td>-0.002</td>
<td>-0.002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contract volume (kg)</td>
<td>-2.29</td>
<td>2.592</td>
<td>-2.17</td>
<td>2.565</td>
<td>-5.53</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(6.16)</td>
<td>(4.19)</td>
<td>(6.25)</td>
<td>(1.13)</td>
<td>(4.26)</td>
<td></td>
</tr>
<tr>
<td>Number of participants</td>
<td>0.415</td>
<td>0.049</td>
<td>0.355</td>
<td>0.440</td>
<td>0.058</td>
<td>0.361</td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.13)</td>
<td>(0.03)</td>
<td>(0.04)</td>
<td>(0.12)</td>
<td>(0.03)</td>
</tr>
<tr>
<td>Squared number of participants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contract duration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standardized average regional price</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dummies for month</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of observations</td>
<td>839</td>
<td>310</td>
<td>1460</td>
<td>839</td>
<td>310</td>
<td>1460</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R(^2)</td>
<td>0.309</td>
<td>0.556</td>
<td>0.297</td>
<td>0.567</td>
<td>0.163</td>
<td></td>
</tr>
</tbody>
</table>

\(^{(a)}\) * significant at 0.01; ** significant at 0.05; *** significant at 0.1
\(^{(b)}\) the robust standard errors of the coefficients in brackets
\(^{(c)}\) dummy variable

#### 5. Conclusion

Our analysis reveals significant differences in the nature of the influence of the same factors on the contract price in competitive procedures and void e-auctions. Moreover, the contract price of sugar is lower in e-auctions than in requests for quotations, but higher in e-auctions compared to void e-auctions. Therefore, our first hypothesis has not been rejected and the price difference between contracts placed using e-auctions and requests for quotations may
be interpreted as a sign of the effectiveness of e-auctions. However, features of void e-auctions
as non-competitive procedures should be subject to further investigation.

The assumption about the positive influence of competition during procurement has been
sustained. The influence of the increase in the number of participants is more significant for less
competitive procedures. This conforms to the finding of MacDonald (2002).

The third hypothesis did not find reliable proof for void e-auctions, but cannot be rejected
for e-auctions and requests for quotations. For contracts placed through e-auctions and requests
for quotations, the growth of the contract volume leads to a lower contract price of sugar, a
higher difference between initial and contract prices and a deviation of the contract price from
the regional retail sugar price.

Results for the fourth hypothesis of the impact on his long-term contract price
characteristics are ambiguous. There is an increase of the contract price for long-term contracts,
the price reduction is smaller for long-term contracts and contract prices are closer to regional
prices for long-term contracts. For the requests for quotations the results are similar, but it is
significant only in the models with contract volume as a regressor. On the other hand, an
increase of the duration of the contract reduces the contract price and makes the difference
between contract and regional prices higher. This result contradicts our initial proposition and
requires additional analysis. In addition, the analysis reveals a number of specific features of the
public procurement of sugar in Russia. One is its size and price non-homogeneity. The analysed
contracts included both small shipments (18–20kg) and very large ones (up to 350t).
Considerable differences in the price of one kilo of sugar were found over time and across
regions, which may be a manifestation of the price fluctuations characteristic of this market.

Requests for quotations were the most common procurement method (53% of all
concluded contracts). The largest contract price decrease as compared to the starting price was
also registered for these contracts. Contracts from a single source represent the largest contracts
in the sample (the average contract volume totaled 69,7 tonnes), and in terms of value they
accounted for almost 57% of the total sugar procurement volume despite making up only 3% of
the number of contracts. These findings show that effective regulations contain numerous
exceptions allowing the largest shipments to evade competitive procurement.

It has also been established that the average prices under contracts were approximately
10% lower than the average regional retail prices during the same period. However, considering
that the average wholesale prices in the sugar market are about 25% lower than the retail prices,
the prices under contracts are generally above wholesale prices. Therefore, the effectiveness of
the placement of contracts based on price differences with the regional average is achievable
only for contracts of small volumes.
Regulators, therefore, ought to consider the costs of procurement procedures and how to reduce them. A good example of this sort of analysis is the report prepared by PricewaterhouseCoopers for the European Commission in 2011 (PwC, 2011). It would also be expedient to monitor important markets using indicators which detect potential collusions.

In conclusion, we would like to note that our findings and recommendations are based on data for the procurement of only one product which restricts possible generalisations.
REFERENCES


### Appendix 1. Main Characteristics of the Sample

#### Table P1. Characteristics of different value groups of contracts

<table>
<thead>
<tr>
<th>Contract value</th>
<th>Number of contracts</th>
<th>Share of contracts (%)</th>
<th>Average standardized contract price of one kilo of sugar</th>
<th>Average standardized starting (maximum) contract price of one kilo of sugar</th>
<th>Average decrease of the standardized price*</th>
<th>Average difference of the contract price from standardized average regional price**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to RUR 100 000</td>
<td>2 229</td>
<td>81,95</td>
<td>0,900</td>
<td>1,015</td>
<td>0,102</td>
<td>0,076</td>
</tr>
<tr>
<td>From RUR 100 000 to 250 000</td>
<td>346</td>
<td>12,72</td>
<td>0,904</td>
<td>1,024</td>
<td>0,111</td>
<td>0,104</td>
</tr>
<tr>
<td>RUR 250 000 and more</td>
<td>145</td>
<td>5,33</td>
<td>0,955</td>
<td>1,033</td>
<td>0,072</td>
<td>0,062</td>
</tr>
<tr>
<td>All contracts</td>
<td>2 720</td>
<td>100</td>
<td>0,903</td>
<td>1,017</td>
<td>0,101</td>
<td>0,132</td>
</tr>
</tbody>
</table>

*As a proportion of the standardized starting (maximum) contract price.
**As a proportion of the standardized average regional price.

#### Table P2. Characteristics of contracts placed by different methods

<table>
<thead>
<tr>
<th>Procurement method</th>
<th>Number of contracts</th>
<th>Share of contracts (%)</th>
<th>Total procurement volume (t)</th>
<th>Total procurement volume (million rubles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single source</td>
<td>81</td>
<td>2,98</td>
<td>5 647</td>
<td>253,8</td>
</tr>
<tr>
<td>Void auction</td>
<td>316</td>
<td>11,62</td>
<td>548</td>
<td>20,8</td>
</tr>
<tr>
<td>Auction</td>
<td>863</td>
<td>31,73</td>
<td>2 257</td>
<td>79,9</td>
</tr>
<tr>
<td>Request for quotations</td>
<td>1 460</td>
<td>53,68</td>
<td>2 820</td>
<td>93,2</td>
</tr>
<tr>
<td>All contracts</td>
<td>2 720</td>
<td>100</td>
<td>11 272</td>
<td>447,8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Procurement method</th>
<th>Average standardized price (kg)</th>
<th>Average drop in the standardized price*</th>
<th>Average price deviation from the standardized average regional price**</th>
<th>Median number of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single source</td>
<td>1,015</td>
<td>0,009</td>
<td>0,002</td>
<td>1</td>
</tr>
<tr>
<td>Void auction</td>
<td>0,920</td>
<td>0,001</td>
<td>0,043</td>
<td>1</td>
</tr>
<tr>
<td>Auction</td>
<td>0,915</td>
<td>0,095</td>
<td>0,067</td>
<td>3</td>
</tr>
<tr>
<td>Request for quotations</td>
<td>0,887</td>
<td>0,132</td>
<td>0,098</td>
<td>3</td>
</tr>
<tr>
<td>All contracts</td>
<td>0,9034131</td>
<td>0,101</td>
<td>0,079</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Procurement method</th>
<th>Average contract size (kg)</th>
<th>Average contract value (million rubles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single source</td>
<td>69 721</td>
<td>3 126 378</td>
</tr>
<tr>
<td>Void auction</td>
<td>1 734</td>
<td>65 904,31</td>
</tr>
<tr>
<td>Auction</td>
<td>2 615</td>
<td>92 141,26</td>
</tr>
<tr>
<td>Request for quotations</td>
<td>1 931</td>
<td>63 851,12</td>
</tr>
<tr>
<td>All contracts</td>
<td>4 144</td>
<td>164 265,80</td>
</tr>
</tbody>
</table>

* As a proportion of the standardized starting (maximum) contract price.
** As a proportion of the standardized average regional price. Positive value means that the contract price is lower than the average regional price.

Table P3. Characteristics of contracts of different terms

<table>
<thead>
<tr>
<th>Term of delivery</th>
<th>Number of contracts</th>
<th>Share of contracts (%)</th>
<th>Total procurement volume (t)</th>
<th>Total procurement volume (million rubles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 100 days</td>
<td>1 336</td>
<td>49,12</td>
<td>2 562</td>
<td>88,4</td>
</tr>
<tr>
<td>From 100 to 200 days</td>
<td>974</td>
<td>35,81</td>
<td>1 705</td>
<td>57,7</td>
</tr>
<tr>
<td>Over 200 days</td>
<td>410</td>
<td>15,07</td>
<td>7 004</td>
<td>301,6</td>
</tr>
<tr>
<td>All contracts</td>
<td>2 720</td>
<td>100</td>
<td>11 272</td>
<td>447,8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Term of delivery</th>
<th>Average standardized price (kg)</th>
<th>Average drop in the standardized price*</th>
<th>Average price deviation from the standardized average regional price **</th>
<th>Median number of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 100 days</td>
<td>0,890</td>
<td>0,122</td>
<td>0,080</td>
<td>3</td>
</tr>
<tr>
<td>From 100 to 200 days</td>
<td>0,907</td>
<td>0,087</td>
<td>0,087</td>
<td>3</td>
</tr>
<tr>
<td>Over 200 days</td>
<td>0,942</td>
<td>0,070</td>
<td>0,055</td>
<td>2</td>
</tr>
<tr>
<td>All contracts</td>
<td>0,903</td>
<td>0,101</td>
<td>0,079</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Term of delivery</th>
<th>Average contract size (kg)</th>
<th>Average contract value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 100 days</td>
<td>1 918</td>
<td>65 977,22</td>
</tr>
<tr>
<td>From 100 to 200 days</td>
<td>1 751</td>
<td>59 287,94</td>
</tr>
<tr>
<td>Over 200 days</td>
<td>17 084</td>
<td>733 929,10</td>
</tr>
<tr>
<td>All contracts</td>
<td>4 144</td>
<td>164 265,80</td>
</tr>
</tbody>
</table>

* As a proportion of the standardized starting (maximum) contract price.
** As a proportion of the standardized average regional price. Positive value means that the contract price is lower than the average regional price.
Introduction

Small and medium-sizes enterprises (SME) are stressed as highly important in the European Union for growth and innovation. The European Commission has adopted the "Small Business Act" which reflects the Commissions political will to recognize SME’s importance as both key players at local level for wellbeing of communities and their importance as employers (2008a). Public procurement is one of the areas which has been targeted with the intention to increase SME’s participation in public procurement (2008b).

Many of the obstacles to SME's access to public procurement have been identified by several government authorities. While some countries apply set-asides and quotas to ease access for SME's, eg Canada, USA, India and South Africa, the European Union instead use recommendations and guidelines (2008b), such as dividing contracts into smaller lots, evaluating best value for money rather than lowest price, and decreasing the administrative burden in submitting bids.

The purpose of this paper is to investigate some measures to increase SME participation and what implications these have for both SME's and larger firms. This is investigated using a unique dataset consisting of a representative sample of all procurements conducted in Sweden during 2007-2008. Does, for example, quality measures and weights matter for SME's chances of winning? And how does the total value and contract time affect the number of bids submitted by SME's?

I find that introducing evaluation of the economically most advantageous bid (instead of the lowest bid) increases SME participation but does even more so for large firms. Although, there is a negative effect on SMEs probability to win by introducing evaluation of quality, making the recommendation merely for show, not having any positive effects for SMEs in public procurement. Also, having more than ten part contracts increases bidding by SME's, but large firms tend to participate less when there are many contracts lots. Dividing the procurement into just a few contracts on the other hand decreases participation across all firms sizes, but more for large firms. The more complicated regulations for procuring above the threshold also decreases participation of SME's, but increases large firms participation.

The paper introduces small and medium-sized enterprises in public procurement in section two, discussing the theoretical predictions of what the estimations might show. Then I will address previous research in section three, and continue with description of the data collected in section four. Section five concerns the methodology to use and the results are presented in section six. I will then discuss the results and conclude the study in section seven and eight, respectively.

SMEs in Public Procurement

Facilitating SME's access to public procurement has recently drawn more interest. Among the first to discuss the problem of low SME participation in public procurements was a report published by the Swedish Institute for Growth Policy Studies (ITPS) which concluded, i.a. that the procurement procedure is complicated and that contracts are too large for SMEs (Tervahauta & Zackrisson 2004).
Using the EU’s definition, firm sizes can be categorized by number of employees in the following manner:

1. Proprietorships and micro firms (0-9 employees),
2. Small firms (10-49 employees),
3. Medium-sized firms (50-249 employees)
4. Large firms (>249 employees)

For the European Union, SME’s make up 99 percent of the number of enterprises and account for 52 percent of the total turnover. In contrast, they secured 33 percent of the value of public procurements during 2006-2008, making them underrepresented in the procurement sector compared to their economic role in the EU. The total value of public procurements account for around 17 percent of the EU GDP (Review of SBA 2011).

Up until the Review of SBA in 2011, only eight member states including Sweden have adopted the EU’s best practices. In both the European and the Swedish legislation, it is firmly pointed out that all firms must have the same opportunities to compete on equal terms (Directive 2004/18/EC; LOU 2007). All bidders in a procurement should thus possess the same opportunities in participating and bidding.

Although, there might be distortions due to different reasons. Large corporations might have relatively more resources in creating and submitting bids, as opposed to smaller companies where submitting a bid is a much larger investment. While the larger firms tend to have a section solely employed to monitor the market, constructing and submitting bids to all possible procurements, creating economies of scale in creating bids, small firms may experience constraints in administrative capacity for creating and submitting bids.

On the basis of this regulation and given a falling SME participation in procurements in Sweden the Swedish Competition Authority (KKV) issued guidelines on how to facilitate participation for SMEs (KKV 2009b). These were, in general, the same as in the ITPS report from 2004. This consist of general advices such as gathering market information pre-advertising, rapidly answering questions about ongoing procurements, and advertising up-coming procurements as soon as possible. Adding to this, it also states more specific guidelines such as avoiding too large and extensive contracts, avoiding short bidding windows and to avoid short time frames between the conclusion of the procurement and the start of delivery. The part in avoiding too large and extensive contracts is of special interest in this study.

When public services and goods are procured, the amount and value procured is often high. Due to both costs associated with procuring and the amount of goods or services needed to satisfy the demand in a municipality or government authority, the procurements can often cover very large amount of a good or service and also cover a large geographic area. Therefore this could hinder SMEs, both because of capacity constraints and due to their limited geographic footprint, in submitting a bid. Procuring large contracts are in the short run often beneficial for the procurer, mainly because of the administrative costs associated with each procurement. In the long run this suppresses competition and might raise prices due to the exclusion of SMEs from different markets (Tervahauta & Zackrisson 2004).

The European Commission has also addressed the problem of obstacles for SMEs participation in public procurement and issued a document with guidelines and caveats when conducting public procurement (EU Commission 2008). In this document the Commission address the problem of too large contracts which excludes SMEs not only by quantity but also by quality. By procuring large diverse contracts consisting of heterogeneous goods and services this effectively excludes specialized SMEs that might only be able to supply in one of the demanded areas. The best practices also include alleviating the administrative burden and evaluating not the lowest price but the economically most advantageous bid (EU Commission 2008). Although, it is important to consider here that a reason for making it complicated to submit a bid can prevent fraudulent bids when quality is hard to observe.

The problem concerning the administrative burden can be substantial for SMEs. While large enterprises have units that only handle bidding in public procurements, in a small firm this might be administered by a single employee who also administers other tasks. Therefore the relative cost to produce a bid and submit may be higher for the smaller company compared to the larger. The cost of bidding is also embedded in the bid since the possible revenue
from the procurement must cover all the firm costs, so high bid-production costs should further raises the total cost of procuring.

Evaluating the bids with the economically most advantageous bid instead of the lowest price also increases SME participation according to the EU Commission (2008). This is due to the SME sector being a source for innovation and R&D activities, and by evaluating not only the cost of buying the products but also possible gains from better suited or more advanced products the SMEs could increase their possibility of winning and thus the participation rate would increase\(^6\).

Some countries use preferential treatment for small-scale businesses, among them India, USA Canada and South Africa. The US federal law of Acquisition defines that two discriminatory measures are allowed to promote SME participation, set-asides and direct discriminatory price adjustment (Federal Acquisition Regulation 2005, Subchapter D, Part 19).

**Innovation**

Schumpeter (1947) introduced the concept of creative destruction in which entrepreneurs develop new products and processes that make the existing obsolete, and argued that large firms have an advantage in innovation. Up until today, few definitive conclusions have been reached, but small firms are also seen as agents of change and development (De Jong & Vermuelen 2006; McAdam et al. 2010; Spencer et al. 2008).

Many argue today that SMEs are a large source of innovation. The European Commission have in recent years highlighted major initiatives to foster innovation through public procurement, for example the Aho-report (2006) and the Barcelona Strategy (2003). Public procurement has the potential to spur innovation through government demand of a specific function, where the design of the function is not defined but up to the innovative firms to develop (Rothwell and Zegveld 1981; Geroski (1990); Edler and Georgiou 2007; Aschhoff and Sofka 2009). Since the government guarantees a certain amount of sales, the market risk is lower for developing new products or services in public procurement.

A recent study by Aschhoff and Sofka (2009) have concluded that public procurement has an impacts of innovation success in firms similar to that of a spillover effects of knowledge infrastructure in universities. It has the possibility to spur firm's innovation performance for smaller firms in regional areas under economic stress and in distributive and technological areas. Public procurement is also found to have the most immediate impact on innovation in small firms, comparing against three other sources of innovation; regulation, domestic university and public R&D subsidies.

Herrera and Sánchez-González (2012) show that small and large, but not medium-sized, firms increased their economic returns when getting economic R&D subsidies compared to firms that did not get these. They also show that small firms, when acquiring subsidies, act in a different way than larger firms. Small firms use the subsidies to extend their knowledge base towards innovation that gives short term effects, but fail to give long term advantages. Also, R&D subsidies were most effective in stimulating R&D intensity in small and medium-sized firms, possibly due to the financial constraints that they face when taking on innovation activities, as opposed to large firms.

Although there is today no possibility to conclude who innovates more, large or small firms, studies have shown that there are major differences between different industries. Also, small and medium sized firms have been shown to behave in similar ways, using patents to develop new products and using search for flexibility as a driver for new processes. Innovation in larger firms is more focused on market expansion strategies, and Vaona and Pianta (2006) argue that since these are the specific mechanisms that can be identified in European industries, this could be an explanation behind the evidence that larger firms perform better in product and process innovation. In summary, the common understanding of the relation between firm size and innovation is that it relies heavily on the institutional setting and what industry the firms operate in.

**Previous Research**

Public Procurement has since Myerson’s (1981) paper on optimal auction design attracted a large body of research. Manelli and Vincent (1995) develop Myerson's theory to address the problem of auctions in procurement where the quality of the product is unknown ex ante and cannot be verified by a court ex post.

\(^6\) Economic theory is though unclear about the effects of evaluating quality on SME participation and winning. Besanko et al (2009) argue that larger firms are actually the driving force of R&D.
The Swedish Agency for Economic and Regional Growth (Tillväxtverket) conducted a survey in 2011 which concluded that only around 12 percent of small and micro enterprises had participated in a public procurement during the last 12 months. This could be compared to medium-sized enterprises where participation rates are 43 percent (Tillväxtverket 2011).

The survey from The Swedish Agency for Economic and Regional Growth investigates three explanations for not participating in public procurement. Among small, and microenterprises 16 percent find it too complicated to submit a bid, 14 percent state that it is too time-consuming and 12 percent think that the contracts procured are too large. Among medium-sized enterprises less than 3 percent suggest non-participation is due to too large contracts, while 10 percent find it too complicated to submit a bid and 12 percent think it is too time-consuming to create a bid (Tillväxtverket 2011). Concluding, small and micro enterprises experience problems with too large contracts, while the other two reasons are relevant for all sizes of SMEs.

A report conducted by GHK under the European Policy Evaluation Consortium (EPEC) tried to evaluate the participation of SMEs in Public Procurement above the threshold in EU (GHK 2010). They accessed the TED database for procurements and contracts awarded during the years 2006 to 2008, collecting around 40 000 contracts in total. They examine the data and estimate a logit model, finding that the value of contract has a negative relation with SME’s probability to win, while evaluating quality actually decreases the possibility of SMEs winning. They also find that multiple contracts increase the SMEs probability of winning. Quality measures is often regarded as a way of improving SMEs probability to win, and thus this finding opposes the common understanding. Although, as they discuss in the paper, there could exist some selection bias based on what procurements that evaluate quality. Therefore these may be large complex products and services that are difficult to supply for SMEs.

Morand (2003) follow up on traditional procurement models developed by Myerson (1981) and Lafonte and Tirole (1987 & 1993) to develop a theoretical model concerning the case for discriminatory measures towards SMEs. By developing mechanism-design problems with different bidders and procurements, he concluded that set-asides are not optimal and that preferential treatment for SMEs must be done using complex non-linear rules.

In conclusion, not much has been done regarding the participation of SMEs in public procurement. Although, both the European Commission and the Swedish Competition Authority have published guidelines to increase participation, based on survey data from SMEs. It is thus interesting to investigate the difference in settings when different number of SMEs participate and win procurements.

**Methodology**

The focus in this paper is on SMEs frequency of participation in public procurement but also their probability of winning, given participation. Participation is estimated with a count model on contract level data where the explanatory variable, \( y \), is the number of micro, small or medium sized firms submitting a bid, which is dependent on the specification of the procurement. The second stage, probability of winning, \( y \), will also be estimated using contract-level data, with the dependent variable taking on four different categories for different types of winners. Due to discrete choices in the explanatory variable a multinomial logit model will be used.

I will estimate the marginal effects of the participation and probability to win using means of the variables. But, since the marginal effects of the count data model and logit model can only be estimated using fixed values of the other variables, I will also in both stages estimate a linear probability model and compare the results. This will provide us with linear marginal effects which the negative binomial regression model and multinomial logit model will not do due to their non-linearity. Although, the non-linear models have the possibility to be interpreted in log-odds ratios instead (Buis 2010).

**Count data model**

To model SME participation, I use count data modeling. To estimate this I will use the Poisson regression model or the negative binomial regression model. A restriction of the Poisson distribution is that the mean and the variance have to be the same to acquire efficient standard errors (Gujarati 2011). If this is not the case, variance in count data is often larger than the mean, there will be overdispersion and standard errors will be downward biased. Thus the Z-values will be inflated, overestimating the coefficient’s statistical significance. The probability distribution for the Poisson model is:

\[
P[Y = y_i | x] = \frac{e^{\lambda x y_i}}{y_i!} = \frac{e^{-\lambda} \lambda^{y_i}}{y_i!}, y_i = 0, 1, 2, ... (1)
\]
And since this is nonlinear in parameters, this will be estimated using maximum likelihood (Gujarati 2011). The likelihood function for the Poisson model is:

$$L(\beta|y, X) = \prod_{i=1}^{N} P(y_i|\mu_i) = \prod_{i=1}^{N} \frac{\exp(-\mu_i)\mu_i^{y_i}}{y_i!}$$

(2)

where $\mu_i = E(y_i|\mathbf{x}_i) = \exp(\mathbf{x}_i\beta)$

If the mean and variance are not the same we can instead use the negative binomial model (Gujarati 2011). For the negative binomial distribution the variance is instead:

$$\sigma^2 = \mu + \frac{\mu^2}{r} ; \mu > 0, r > 0$$

(3)

where $\mu$ is the mean and $r$ is the number of successes in the model. The negative binomial model is also estimated using maximum likelihood method.

Consequently, a test should first be performed to see if the variance is equal to the mean in the data, and the results of this will be basis for choosing of estimation method. Continuing I will present the implementation of the count data model in estimating the participation of SME’s in public procurement.

**Frequency of SME participation**

As noted before, the reason for the procurement agent wanting to facilitate participation for SMEs is to benefit from the increase in competition from having heterogeneous bidders with diverse goods or services to choose from. The policies for facilitating SME participation that will be investigated in this paper are part contracts, evaluation of the economically most advantageous bid and multiple winners. The first two are common in the literature on how to facilitate SME bidding (Konkurrensverket 2009a & 2009b, EU Commission 2008, ITPS 2004, Tillväxtverket 2011), while the last one is addressed more seldom.

The explanatory variable will be the number of SMEs bidding for the contract. To further explore the participation of small firms I will estimate 3 models, where the first one estimates the number of firms participating with less than 10 employees (proprietorships and micro firms), the second one estimates the number of firms participating with less than 50 employees (small firms or less), and the last one estimates the number of participating firms with 250 employees or less (medium-sized firms and lower). This model will be estimated on contract level, estimating how many SMEs that are present in all bidding situations. The characteristics of the model are:

$$\lambda_t = e^{\mathbf{X}\beta} = (\beta_1 + \beta_2\text{Part}) + \beta_3\ln(\text{Value}) + \beta_4\text{Qual} + \beta_5\text{Thres} + \beta_6\text{MW} + \beta_7\mathbf{X} + \epsilon_t$$

(7)

Where $\text{Part}$ is a vector of intervals of contracts in the procurement categorized 2-4, 5-10 and more than 11 contracts. $\text{Value}$ is the value of the contract. $\text{Qual}$ is a dummy variable which is one(1) if the contract has some evaluation of quality. $\text{Thres}$ indicates if the procurement is above the threshold or not. $\text{MW}$ is another dummy variable for multiple winners, and $\mathbf{X}$ is a vector of control dummy variables of procured good or service and buyer. I will also include interaction variables where there could be effects that increase or decrease when different characteristics are combined. Thus the estimation will be explored further by adding multiplicative variables on part procurements and value, and threshold and value.

The value of the whole procurement should ceteris paribus be negatively correlated with SME participation, due to the positive relation between a larger contract value and higher costs of bidding and the difficulty to be able to deliver larger contracts. Since the data for separate contracts is not available, I will divide the value of the procurement by the number of contracts to acquire a value for the part procurements. This can, on average, be assumed to be a correct measure of the contract value.

One of the major variable to be tested here is part procurements. The effect of splitting the procurement into lots should facilitate SME bidding and this is also what is repeatedly recommended to encourage more SMEs to bid (Konkurrensverket 2009a & 2009b, EU Commission 2008, ITPS 2004, Tillväxtverket 2011). The use of part
procurements will be divided into different categories, containing 2-4 contracts, 5-10 contracts and 11 contracts or more. Doing this will provide a better approximation of how having few or many part contracts affect the probability of receiving SME bids.

The evaluation of quality is often stated as a way of rewarding innovation and product development (Konkurrensverket 2009a & 2009b, EU Commission 2008, ITPS 2004, Tillväxtverket 2011). And since SMEs are often referred to as engines of innovation and R&D, SMEs should be interested in participating to a further extent if the procurement has some element of quality in the evaluation process, often referred to as evaluation of the economically most advantageous bid, as opposed to evaluation of the lowest bid. This has not been proven and currently there is not any clear research supporting or disproving this theory.

**Multinomial logit model**

For the second part of the paper, the multinomial logit model will be used. In a non-linear multiple choice model such as the multinomial logit model, the explanatory variables are used to estimate the predicted probability of choosing the different outcomes. Behind the choice model is a notion of utility maximization by the individual making the choice. Assume that the \( i \)th individual chooses alternative \( j \) to maximize utility \( U^j \), then

\[
p_{ij} = P[y_i = j] = P[u_{ij} + \xi_j > u_{ih} + \xi_h \quad \text{for all } h \neq j]
\]

where \( u_{ij} = x^\prime \beta_j \)  

And to estimate these parameters, the joint distribution of \( \xi_{ij} \) has to specified. Assume that all individuals choose independently, so that \( \xi_{ij} \) and \( \xi_{jh} \) are independent for all \( i \neq i' \) and all \( j, h = 1, ..., m \). The log-likelihood can then be defined as (Heij et al 2004)

\[
\log(L) = \sum_{i=1}^{n} \sum_{j=1}^{m} y_{ij} \log(p_{ij}) = \sum_{i=1}^{n} \log(p_{0i})
\]

And the probability can thus be written as

\[
p_{ij} = \frac{e^{x_i^\prime \beta_j}}{\sum_{i=1}^{n} e^{x_i^\prime \beta_i}}
\]

Modelling SME’s success in public procurement I suggest there are two approaches that have to be taken into account. First there is the procuring agent’s aim to choose the best bid to fulfil the contract, thereby evaluating the bids and selecting the bid which is associated with the maximum utility for the agent. The other approach is that of the firm bidding, where the probability of winning the procurement is the variable of interest. This is of course conditional on deciding to place a bid in the procurement, which will only be done if the firm has some notion of actually having a chance to win the procurement. Otherwise they will not participate in the bidding.

Therefore I will use the logit model to estimate the probability of winning the procurement as a small company, also dependent on the characteristics of the procurement and the bidding firm.

In this study it is relevant to estimate the interaction effects between firm size and the variables of interest. Although, in a nonlinear model such as the logit model, the interaction effects are often misinterpreted and wrongly estimated. To solve this problem I will use the procedure suggested by Ai and Norton (2003) and graph how the interaction effects differ both in magnitude and significance in relation to the dependent probability variable. The drawback of this estimation is that only one interaction effect can be estimated at a time, but due to the more precise estimation it should not affect the results for the different interaction effects considerably.

Using non-linear models has some limitations regarding the common interpretation of marginal effects which have been highlighted by Ai and Norton (2003) and Greene (2010). Buis (2010) solves this problem by interpreting the log-odds instead of the marginal effects, since these are linear in a non-linear model and since the effects are presented on a multiplicative scale. Since I want to use interaction variables in this non-linear model, I will use Buis
(2010) approach in interpreting the coefficient in log-odds ratios. Moving on, the application of the multinomial logit model will be presented before introducing the data.

**SME success in winning**

The probability of winning for an SME should be driven by many of the same factors that affect the probability of SMEs bidding in the procurement, as argued before. Concerning the fact that it is the procurement agent that decides on who will win the contract, there is an underlying utility maximization equation that the agent maximizes by choosing the best option or bid on the basis of the information available. The characteristics of the procurement are included in the estimation because it influences how good a bid the possible supplier can submit. E.g. if the procurement is divided into smaller lots, does this increase the probability that a SME will have the best bid?

For this estimation I will, just as the participation estimation, use contract-level data. The estimation will include nearly the same variables as before: \textit{Part, Value, Qual, Thres} and the vector of controls for good or service (\(X\)). The difference is that this time I will not include procurements with multiple winners, since this might change the bidding behaviour of the firms. Taking into account that there will be more than one winner in the procurement, it is possible that bidders might adjust their bids with a higher mark-up if they believe that they have a good chance of winning. Therefore I will exclude these observations from the data.

Using a multinomial logit model where the outcomes are compared to each other, one of the outcomes must be the default. I choose to set won by medium-sized firms as the default outcome both because it is one of the outcomes in the middle, and that I believe that micro and small firms behave more similar than medium and large firms. Therefore it should facilitate comparison between different firm sizes.

**Description of the data**

The data I will use was collected from a weighted random selection of government authorities, municipalities and counties. First, we use two different groups of procurers, one consisting of government authorities and one of municipalities and counties. Twenty authorities were randomly selected by weighting the authorities by number of employees, and twenty municipalities and counties were randomly selected by using number of inhabitants as weight parameter.

A sample of twenty procurements were then randomly selected from a gross list of all procurements conducted during 2007 and 2008 from each entity when applicable (some entities had not conducted twenty or more procurements during this time period). In total 652 procurements were gathered, and the whole dataset consists of 1610 part procurements. 531 of the procurements did not have any part contracts.

The dataset has a total of 11 236 bids, Table 1 shows how these are divided among proprietors, micro, small, medium and large enterprises.

<table>
<thead>
<tr>
<th>Enterprise</th>
<th>No. of bids</th>
<th>Percent of bids</th>
<th>Winning bids</th>
<th>Percent of winning bids</th>
<th>Winning probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proprietors</td>
<td>0-1</td>
<td>2 912</td>
<td>25.92</td>
<td>579</td>
<td>20.35</td>
</tr>
<tr>
<td>Micro</td>
<td>2-9</td>
<td>2 206</td>
<td>19.63</td>
<td>443</td>
<td>15.57</td>
</tr>
<tr>
<td>Small</td>
<td>10-49</td>
<td>2 342</td>
<td>20.84</td>
<td>787</td>
<td>27.65</td>
</tr>
<tr>
<td>Medium</td>
<td>50-249</td>
<td>1 310</td>
<td>11.66</td>
<td>462</td>
<td>16.23</td>
</tr>
<tr>
<td>Large</td>
<td>&gt;250</td>
<td>2 466</td>
<td>21.95</td>
<td>575</td>
<td>20.20</td>
</tr>
<tr>
<td>Total</td>
<td>--</td>
<td>11 236</td>
<td>100</td>
<td>2 846</td>
<td>100</td>
</tr>
</tbody>
</table>

From these statistics we can note that SMEs account for more than three quarters of the total amount of bids in the dataset. Reducing the category to include only small firms and below they still account for more than 60 % of all bids in the dataset. Therefore Sweden might actually be a good example of how to design procurements that attract bids from small firms and enables small firms to actually win contracts. One thing to think about here is that the
categorization of firm sizes are quite large, so since as stated before 99 percent of all Swedish firms are SMEs, the remaining 1 percent that are not SMEs account for more than 1/5 of all bids.

One of the focal points in the study is the effect of part procurements. For a total of 652 procurements, over 80 percent, 534, only allow bidding on the procurement as one intact contract. The remaining 131 procurements are divided into a diverse number of contracts shown in Figure 1.

When dividing a procurement into lots, we can see that it is very common to divide into 2-5 parts, while it is very uncommon to have 10 or more contracts. For estimation purposes it is thus reasonable to divide the number of part procurements into a few categories.
Results

**SME Participation**

The results reported for the count data models are all exponentiated (in odds ratios form), so all values will be non-negative7. I estimate 4 different models for each firm category (micro, small, medium-sized, large and all firms). In the appendix I present all the results from the different models, but here I restrict the presentation to the fourth model for each category, since this shows the best fit (probably due to the inclusion of CPV controls).

Table 2: Main results from all participation regressions

<table>
<thead>
<tr>
<th></th>
<th>Micro firms</th>
<th>Small firms</th>
<th>Medium-sized firms</th>
<th>All firms</th>
<th>Large firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-4 part procurements</td>
<td>0.892</td>
<td>0.800*</td>
<td>0.609***</td>
<td>0.776***</td>
<td>0.601***</td>
</tr>
<tr>
<td></td>
<td>(0.114)</td>
<td>(0.0915)</td>
<td>(0.0936)</td>
<td>(0.0633)</td>
<td>(0.0938)</td>
</tr>
<tr>
<td>5-10 part procurements</td>
<td>0.892</td>
<td>0.824</td>
<td>1.224</td>
<td>0.892</td>
<td>0.738**</td>
</tr>
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<td>(0.112)</td>
<td>(0.0980)</td>
<td>(0.175)</td>
<td>(0.0704)</td>
<td>(0.114)</td>
</tr>
<tr>
<td>&gt;10 part procurements</td>
<td>1.294**</td>
<td>1.602***</td>
<td>1.040</td>
<td>1.199**</td>
<td>0.852</td>
</tr>
<tr>
<td></td>
<td>(0.146)</td>
<td>(0.0950)</td>
<td>(0.150)</td>
<td>(0.0856)</td>
<td>(0.122)</td>
</tr>
<tr>
<td>ln(Value in 100000 SEK)</td>
<td>0.990</td>
<td>1.097***</td>
<td>1.225***</td>
<td>1.078***</td>
<td>1.188***</td>
</tr>
<tr>
<td></td>
<td>(0.0248)</td>
<td>(0.0222)</td>
<td>(0.0340)</td>
<td>(0.0163)</td>
<td>(0.0334)</td>
</tr>
<tr>
<td>Threshold</td>
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<td>0.934</td>
<td>0.871</td>
<td>0.878**</td>
<td>1.281**</td>
</tr>
<tr>
<td></td>
<td>(0.0623)</td>
<td>(0.0878)</td>
<td>(0.110)</td>
<td>(0.0561)</td>
<td>(0.158)</td>
</tr>
<tr>
<td>Evaluation of quality</td>
<td>1.465***</td>
<td>1.052</td>
<td>1.802***</td>
<td>1.357**</td>
<td>2.252***</td>
</tr>
<tr>
<td></td>
<td>(0.118)</td>
<td>(0.0734)</td>
<td>(0.183)</td>
<td>(0.0688)</td>
<td>(0.229)</td>
</tr>
<tr>
<td>Multiple winners</td>
<td>3.801***</td>
<td>2.409***</td>
<td>2.625***</td>
<td>2.631***</td>
<td>1.975***</td>
</tr>
<tr>
<td></td>
<td>(0.353)</td>
<td>(0.185)</td>
<td>(0.284)</td>
<td>(0.160)</td>
<td>(0.236)</td>
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<td>Constant</td>
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<td>1.22e-09</td>
<td>0</td>
<td>1.873</td>
<td>0.416</td>
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<tr>
<td></td>
<td>(1.457)</td>
<td>(1.91e-05)</td>
<td>(1.22e-06)</td>
<td>(1.338)</td>
<td>(0.423)</td>
</tr>
<tr>
<td>Alpha</td>
<td>0.501***</td>
<td>0.156***</td>
<td>0.321***</td>
<td>0.271**</td>
<td>0.642***</td>
</tr>
<tr>
<td></td>
<td>(0.0435)</td>
<td>(0.0312)</td>
<td>(0.0649)</td>
<td>(0.0169)</td>
<td>(0.0767)</td>
</tr>
<tr>
<td>CPV controls</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Observations</td>
<td>1.332</td>
<td>1.332</td>
<td>1.332</td>
<td>1.332</td>
<td>1.332</td>
</tr>
<tr>
<td>chi2</td>
<td>1230</td>
<td>702.4</td>
<td>662.1</td>
<td>1596</td>
<td>769.0</td>
</tr>
<tr>
<td>p</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pseudo R2</td>
<td>0.225</td>
<td>0.159</td>
<td>0.206</td>
<td>0.205</td>
<td>0.202</td>
</tr>
</tbody>
</table>

The models acquire significance, shown by the likelihood-ratio and p-values. The likelihood-ratio increases strongly with the inclusion of CPV controls in the estimation. The alpha coefficient is the measure for overdispersion and is also significantly different from zero in all the models, even in model 1 (test not shown here). This signals that there exists overdispersion, so the Poisson model would have overestimated significances. One must be careful not to interpret a lot into the pseudo R² value developed by McFadden (1974), but it is still interesting to include in the presentation and shows an increasing explanatory value throughout the different models, taking the largest leap when including CPV controls. Interesting is that it is also very similar across all categories of dependent variables.

Interpreting these incidence rate ratio coefficients, we must first be aware of the transformation of the value of the procurement. The value variable has been decreased by the mean8 due to ease of interpretation. The mean value of the variable value is thus 0, and one unit increase in the variable means an increase of 100 000 Swedish Krona (SEK). Although not significant, I can demonstrate that this increase of one unit in the value variable gives (=1-0.99) 1% less bids from micro firms for that contract. In relation, small firms facing the same increase in value would increase their bids by 9.7%, and medium sized enterprises increase their bidding by 22.5%. In line with predictions and logic, medium firms increase their participation even more than micro and small firms. Also, large

---

7 Incidence-rate ratios shows the multiplicative effect of the coefficient on the outcome. As such, a value of above one(1) has a positive effect on the outcome and a value between zero(0) and one has a negative effect on the number of bids for the contract.

8 Divided by the mean of the variable (=21.8 million SEK)
firms unsurprisingly increase their participation when value increases, although medium sized firms actually increase their participation more.

Looking at part procurements, dividing procurements into 2–4 part does not have any significant effect on micro firms participation, but significantly decreases all other types of firms participation by at least 20%. Medium-sized and large firms decrease their participation by nearly 40% in this case, which is a relatively large decrease. As an example we can compare two contracts where one is a sole procurement and the other one is one of 2–4 contracts in a procurement. So the sole procurement would in this case acquire say 10 bids from medium sized firms, while the part procurement only gets around 6 bids.

Having 5 to 10 part procurements seems to have no effect except for large firms who decrease their participation by around 25%. Interesting is also to note that all SMEs increase their bidding when there are more than 10 part contracts, while the larger firm always bid less when the procurement is divided into part contracts.

Moving on to the two other variables of main interest, including some evaluation of quality increases all firms sizes participation, even though the coefficient for small firms does not acquire significance. Only observing the significant effects, larger firms increase their participation relatively more than the smaller firms, with large firms bidding twice as much as they would have were there no quality measure. Apparently, this increases overall participation, but more so for larger firms.

Multiple winners is the one measure that makes micro firms participate relatively more than all other firms, even though the increase is high for all firm types. Having multiple winners increase the total amount of bids by more than 100%, and almost increases the participation of micro firms by three times as much as it would have been otherwise. This is the most dramatic increase, and interesting to observe for this variable is that large firms increase their participation by far less than the other firms.

There is also some threshold effect in place. Procuring above the threshold increases the bidding from large firms by 28%, but has no significant effect on small or medium sized firms. There is also a large decrease in the participation of micro firms for procurements above the threshold, suggesting that the more complicated regulations that take place above the threshold obstructs micro firms from participating in these.

**SME winning**

Running the multinomial logit regression for probability of winning, medium-sized firms are set as the default outcome. Results are reported in table 3. Note that this table is not in incidence-rate ratios, as table 2 was, but in log odds compared to the default category.

### Table 3: Estimation of probability of winning

<table>
<thead>
<tr>
<th>Multinomial logit</th>
<th>Micro</th>
<th>Small</th>
<th>(default) Medium</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>2–4 part procurements</td>
<td>1.053**</td>
<td>1.254**</td>
<td>0.863*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.502)</td>
<td>(0.521)</td>
<td>(0.514)</td>
<td></td>
</tr>
<tr>
<td>5–10 part procurements</td>
<td>0.400</td>
<td>0.158</td>
<td>-0.262</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.381)</td>
<td>(0.405)</td>
<td>(0.438)</td>
<td></td>
</tr>
<tr>
<td>&gt;10 part procurements</td>
<td>1.431***</td>
<td>1.789***</td>
<td>0.260</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.446)</td>
<td>(0.467)</td>
<td>(0.453)</td>
<td></td>
</tr>
<tr>
<td>ln(Value)</td>
<td>-0.279***</td>
<td>-0.225***</td>
<td>-0.130</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0805)</td>
<td>(0.0856)</td>
<td>(0.0814)</td>
<td></td>
</tr>
<tr>
<td>Threshold</td>
<td>-0.229</td>
<td>0.00895</td>
<td>0.631*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.325)</td>
<td>(0.351)</td>
<td>(0.338)</td>
<td></td>
</tr>
<tr>
<td>Evaluation of quality</td>
<td>-0.191</td>
<td>-0.958***</td>
<td>0.339</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.261)</td>
<td>(0.272)</td>
<td>(0.288)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>4.549</td>
<td>3.887</td>
<td>22.34</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(35,905)</td>
<td>(35,630)</td>
<td>(30,213)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>1,007</td>
<td>1,007</td>
<td>1,007</td>
<td>1,007</td>
</tr>
<tr>
<td>CPV controls</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Log-Likelihood</td>
<td>-1022</td>
<td>-1022</td>
<td>-1022</td>
<td>-1022</td>
</tr>
<tr>
<td>Pseudo R²</td>
<td>0.233</td>
<td>0.233</td>
<td>0.233</td>
<td>0.233</td>
</tr>
<tr>
<td>Chi²</td>
<td>622.5</td>
<td>622.5</td>
<td>622.5</td>
<td>622.5</td>
</tr>
</tbody>
</table>
Merely observing the number of significant variables in table 3, medium-sized firms obviously behave relatively more similar to large firms than to micro and small firms. There are more significant differences between the default outcome and micro and small firms, than between the default and large firms. The model in table 3 achieves the strongest support when testing the fit between this model and other with fewer variables (see table 10 in the appendix).

There is a significant difference across all firm sizes when observing the dummy for 2-4 part procurements. The coefficients indicate that large firms tend to win more than medium-sized firms when there are few part contracts, and micro and small firms tend to win even more. Furthermore, there are no significant differences in winning probabilities when having 5-10 part contracts, but having more than 10 part contracts significantly increases the winning probabilities of micro and small firms. Again, small firms achieve the higher probability to win comparing micro and small firms to medium-sized firms. For large firms there is neither a significant increase or decrease in the probability to win when the procurement has more than 5 part contracts.

Value has a rather clear impact on smaller firms, where an increase in value decreases the probability for micro and small firms to place a winning bid. The magnitude for these two outcomes when comparing to medium-sized firms is also very similar. Large firms do not show any significantly different effects in probability to win for increases in value, compared to the default. This indicates that medium and large firms tend to have similar probabilities to win that do not change relative to each other when value changes.

Contrary to the rest of the coefficients, the effect of threshold is significantly different from the default for large firms only. The estimated coefficient shows that large firms have in increasing probability to win above the threshold compared to SMEs. Large firms have as such a higher probability of winning above the threshold.

Finally, I also perform a logit regression on a higher level where I pool the SME bids and estimate the above variables on a binary outcome, if a SME won the contract or not. This is showed in table 9 in the appendix, and concludes that contracts above the threshold are harder for SMEs to win and that evaluation of quality also decrease SME winning probabilities. Similar to the above estimation in table 3, SMEs probability to win increases by including many part contracts.

Concluding remarks

This paper addresses the issue of SME participation and success in public procurement. SMEs often refer their relatively low participation in public procurement compared to their overall role in the economy due to cost of bidding and complicated legislation.

The result from this study shows that SME participation can increase by dividing the procurement into many part contracts, while having a few can significantly decrease participation for both SMEs and large firms. Introducing multiple winners unsurprisingly increases number of SME bids, even more than the increase in bids from large firms.

One of the most addressed recommendations to increase SME participation is introducing some quality measure in the evaluation of bids, often through the notion that SMEs are more innovative and therefore can win by quality, while they cannot compete with large firms in a lowest price evaluation. The results from this study shows that SME participation does indeed increase, but participation by large firms increase even more. And although there is an increase in SME bidding, the probability for small firms to actually win the contract decreases, while I find a positive but insignificant effect for large firms. Therefore the conclusion is that evaluation of quality merely has a window-dressing effect, providing a higher SME participation but actually a decrease in SMEs probability to win.

Other conclusions are that the more complicated legislation above the threshold decreases SME participation, while it increases large firms participation and their probability to win. Also, value has a positive effect on participation for all sizes of firms, while it has a significant negative effect for micro and small firms on their probability of winning procurement contracts.
### Appendix

<table>
<thead>
<tr>
<th>Negative binomial regression</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2-4 part procurements</strong></td>
<td>2.002***</td>
<td>2.194***</td>
<td>1.212</td>
<td>0.892</td>
</tr>
<tr>
<td></td>
<td>(0.289)</td>
<td>(0.315)</td>
<td>(0.156)</td>
<td>(0.114)</td>
</tr>
<tr>
<td><strong>5-10 part procurements</strong></td>
<td>2.394***</td>
<td>2.290***</td>
<td>1.188</td>
<td>0.892</td>
</tr>
<tr>
<td></td>
<td>(0.325)</td>
<td>(0.306)</td>
<td>(0.150)</td>
<td>(0.112)</td>
</tr>
<tr>
<td><strong>&gt;10 part procurements</strong></td>
<td>3.718***</td>
<td>3.798***</td>
<td>1.665***</td>
<td>1.294***</td>
</tr>
<tr>
<td></td>
<td>(0.341)</td>
<td>(0.346)</td>
<td>(0.161)</td>
<td>(0.146)</td>
</tr>
<tr>
<td><strong>ln(Value) (demeaned)</strong></td>
<td>1.347***</td>
<td>1.273***</td>
<td>1.101***</td>
<td>0.990***</td>
</tr>
<tr>
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<td>(0.0275)</td>
<td>(0.0284)</td>
<td>(0.0241)</td>
<td>(0.0248)</td>
</tr>
<tr>
<td><strong>Threshold</strong></td>
<td>0.225***</td>
<td>0.232***</td>
<td>0.317***</td>
<td>0.612***</td>
</tr>
<tr>
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<td>(0.0186)</td>
<td>(0.0191)</td>
<td>(0.0243)</td>
<td>(0.0623)</td>
</tr>
<tr>
<td><strong>Evaluation of quality</strong></td>
<td>1.645***</td>
<td>1.537***</td>
<td>1.465***</td>
<td>1.185***</td>
</tr>
<tr>
<td></td>
<td>(0.145)</td>
<td>(0.123)</td>
<td>(0.118)</td>
<td>(0.185)</td>
</tr>
<tr>
<td><strong>Multiple winners</strong></td>
<td>4.915***</td>
<td>3.801***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.447)</td>
<td>(0.353)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Constant                    | 0.026***| 0.0424***| 0.284***| 1.148   |
|                             | (0.00795)| (0.0132)| (0.0866)| (1.457) |
| **Alpha**                   | 1.345***| 1.284***| 0.864***| 0.501***|
|                             | (0.0789)| (0.0709)| (0.0595)| (0.0435)|
| **CPV controls**            | N       | N       | N       | Y       |
| **Observations**            | 1.335   | 1.335   | 1.335   | 1.332   |
| **chi2**                    | 587.8   | 618.8   | 901.3   | 1230    |
| **p**                       | 0       | 0       | 0       | 0       |
| **Pseudo R2**               | 0.107   | 0.113   | 0.165   | 0.225   |

Coefficients in incidence rate ratios; se Eform in parentheses; *** p<0.01, ** p<0.05, * p<0.1

<table>
<thead>
<tr>
<th>Negative binomial regression</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2-4 part procurements</strong></td>
<td>1.443***</td>
<td>1.445***</td>
<td>1.129</td>
<td>0.800***</td>
</tr>
<tr>
<td></td>
<td>(0.167)</td>
<td>(0.168)</td>
<td>(0.128)</td>
<td>(0.0915)</td>
</tr>
<tr>
<td><strong>5-10 part procurements</strong></td>
<td>1.195</td>
<td>1.192</td>
<td>0.851</td>
<td>0.824</td>
</tr>
<tr>
<td></td>
<td>(0.138)</td>
<td>(0.138)</td>
<td>(0.0991)</td>
<td>(0.0980)</td>
</tr>
<tr>
<td><strong>&gt;10 part procurements</strong></td>
<td>2.916***</td>
<td>2.917***</td>
<td>1.965***</td>
<td>1.602***</td>
</tr>
<tr>
<td></td>
<td>(0.231)</td>
<td>(0.231)</td>
<td>(0.165)</td>
<td>(0.155)</td>
</tr>
<tr>
<td><strong>ln(Value) (demeaned)</strong></td>
<td>1.195***</td>
<td>1.192***</td>
<td>1.120***</td>
<td>1.097***</td>
</tr>
<tr>
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<td>(0.0194)</td>
<td>(0.0214)</td>
<td>(0.0204)</td>
<td>(0.0222)</td>
</tr>
<tr>
<td><strong>Threshold</strong></td>
<td>0.633***</td>
<td>0.634***</td>
<td>0.753***</td>
<td>0.934</td>
</tr>
<tr>
<td></td>
<td>(0.0419)</td>
<td>(0.0420)</td>
<td>(0.0494)</td>
<td>(0.0876)</td>
</tr>
<tr>
<td><strong>Evaluation of quality</strong></td>
<td>1.017</td>
<td>0.924</td>
<td>1.052</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0721)</td>
<td>(0.0631)</td>
<td>(0.0734)</td>
<td></td>
</tr>
<tr>
<td><strong>Multiple winners</strong></td>
<td>2.300***</td>
<td>2.409***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.171)</td>
<td>(0.185)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Coefficients in incidence rate ratios; se Eform in parentheses; *** p<0.01, ** p<0.05, * p<0.1
### Table 6: Results participation medium-sized firms

<table>
<thead>
<tr>
<th>Negative binomial regression</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-4 part procurements</td>
<td>1.085</td>
<td>1.127</td>
<td>0.835</td>
<td>0.609***</td>
</tr>
<tr>
<td></td>
<td>(0.181)</td>
<td>(0.182)</td>
<td>(0.129)</td>
<td>(0.0936)</td>
</tr>
<tr>
<td>5-10 part procurements</td>
<td>1.892***</td>
<td>1.772***</td>
<td>1.252</td>
<td>1.224</td>
</tr>
<tr>
<td></td>
<td>(0.275)</td>
<td>(0.252)</td>
<td>(0.174)</td>
<td>(0.175)</td>
</tr>
<tr>
<td>&gt;10 part procurements</td>
<td>1.733***</td>
<td>1.628***</td>
<td>0.931</td>
<td>1.040</td>
</tr>
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<td>(0.190)</td>
<td>(0.178)</td>
<td>(0.116)</td>
<td>(0.150)</td>
</tr>
<tr>
<td>ln(Value) (de-meaned)</td>
<td>1.462***</td>
<td>1.375***</td>
<td>1.272***</td>
<td>1.225***</td>
</tr>
<tr>
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<td>(0.0354)</td>
<td>(0.0345)</td>
<td>(0.0319)</td>
<td>(0.0340)</td>
</tr>
<tr>
<td>Threshold</td>
<td>0.493***</td>
<td>0.494***</td>
<td>0.538***</td>
<td>0.871</td>
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<tr>
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<td>(0.0460)</td>
<td>(0.0454)</td>
<td>(0.0480)</td>
<td>(0.110)</td>
</tr>
<tr>
<td>Evaluation of quality</td>
<td>1.964***</td>
<td>1.836***</td>
<td>1.802***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.203)</td>
<td>(0.184)</td>
<td>(0.183)</td>
<td></td>
</tr>
<tr>
<td>Multiple winners</td>
<td>3.014***</td>
<td>2.625***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.320)</td>
<td>(0.284)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.00276***</td>
<td>0.00449***</td>
<td>0.00131***</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>(0.00103)</td>
<td>(0.00167)</td>
<td>(0.000484)</td>
<td>(1.22e-06)</td>
</tr>
<tr>
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Coefficients in incidence rate ratios; se/Eform in parentheses; ***p<0.01, **p<0.05, *p<0.1

### Table 7: Results participation All Firms

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<th>Model 4</th>
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Coefficients in incidence rate ratios; se/Eform in parentheses; ***p<0.01, **p<0.05, *p<0.1
### Table 8: Results participation large firms

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Coefficients in incidence rate ratios; se fitted in parentheses; *** p<0.01, ** p<0.05, * p<0.1

### Table 9: Probability of SME wins

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Observations | 930 |
CPV controls | X |
Log-Likelihood | -372.8 |
Pseudo R² | 0.224 |
Chi² | 214.8 |
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References


Federal Acquisition Regulation (2005) Issued by the General Services Administration, Department of Defense, National Aeronautics and Space Administration, Volume 1, March.


The role of small and medium-sized enterprises in a sustainable public procurement system

Anna Gorczynska, PhD

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Faculty of Law and Administration
University of Lodz, Poland

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1. The role of SMEs in the EU market

In a period of economic crisis, the promotion of small and medium-sized enterprises seems to be an important issue as they constitute almost 99 per cent of European enterprises and play a key role in economic growth.

The Commission gives the following definition of small and medium-sized enterprises in Recommendation 2003/361/EC: (1) microenterprises — under 10 employees, a turnover of under EUR 2 million, an annual balance sheet total of under EUR 2 million; (2) small enterprises — under 50 employees, a turnover of under EUR 10 million, an annual balance sheet total of under EUR 10 million; (3) medium-sized enterprises — under 250 employees, a turnover of under 50 million, an annual balance sheet total of under EUR 43 million.

The European Union still faces challenging economic conditions with an intensifying sovereign debt crisis in the euro zone, the spectre of double-dip recession looming in several countries, and faltering growth in the better performing ones. In this context, however, in 2012 SMEs retain their position as the backbone of the European economy: there are over 20.7 million such enterprises, which amount to more than 98 per cent of total businesses. It is estimated that in 2012 SMEs account for 67 per cent of total employment in the European enterprises and 58 per cent of gross value added (GVA). The total SME employment of 87 million (29.6 per cent of total employment in European companies) plays a substantial role in the European economy. For comparison, in Poland the total number of small and medium-sized enterprises is estimated at 1.4 million, which corresponds to 99.8 per cent of the total number of companies in Poland. Polish SME employment amounts to 5.6 million (68.2 per cent of total employment in the private sector) and produces 51.5 per cent of gross value added.

In November 2013 European Commission published an Annual Report on European SMEs, A recovery on the Horizon? 2013 is likely to mark a turning point for the EU SMEs. After five years of an uncertain economic environment, 2013 is expected to be the first year since 2008 with a combined increase in aggregated employment and value-added of EU’s SMEs. The total employment in the EU SMEs is expected to increase by 0.3% and value-added by 1% as compared to 2011. Preliminary forecasts expect the positive developments further accelerating in 2014.

However, the difficult economic environment continues to pose severe challenges to the sector of small and medium-sized enterprises in all Member States of the European Union. The risk of decreased gross domestic product aggravates the economic situation of SMEs. Therefore the question arises whether it would be possible to promote small and medium-sized enterprises by the public procurement system.

Thus, reasons should be presented for the special need for increasing SME participation in the public financing system. As mentioned above, SMEs are predominant in the market and justification for their wider participation in tendering could be motivated not only by their crucial role in the economy, but also by their capacity for innovation, organizational simplicity, flexibility and ability to quickly respond to the needs of the market. Secondly, the activity of SMEs in the procurement market would be profitable for those companies, leading to their higher revenues and economic growth.

The public procurement system in the European Union is of dual nature, meaning that contracts above a particular threshold are regulated by the EU legal system. The thresholds are regulated in both directives on public procurement, but they have been amended several times in relation to the Government Procurement Agreement (GPA). The thresholds are recalculated by the Commission every two years and the calculation is based on the average daily value of the Euro, expressed in Special Drawing Rights (SDRs). Since 1st January 2014 the current thresholds are as follows: EUR 134,000 for public supply and service contracts awarded by central government authorities; EUR 207,000 for public supply and service contracts awarded by contracting authorities which are not central government authorities; certain products in the field of defence awarded by the central government thresholds.
authorities, certain services in the field of R&D, telecommunications, hotels and catering, transport by rail and waterway, provision of personnel, vocational training, investigation and security, certain legal and social services, certain sanitary, recreational, cultural and sports services; EUR 414,000 for supplies and services in the utilities sector; EUR 5,186,000 in the case of public works contracts in both classic and utilities sectors. Contracts under the threshold remain outside the legal system of the EU and fall under the scope of national legislation.[8] The Member States are therefore able to implement measures to promote SMEs in their national public procurement systems. However, even in the case of under-the-threshold contracts, the Member States have to take into consideration the basic rules of the Common Market which must be observed for all types of contracts. Some controversy arises regarding the implementation of legal measures favouring SMEs in above-the-threshold contracts. Thus, the problem of the legality of privileged treatment of SMEs such as, e.g., set-asides or other special preferences for contracts covered by EU directives has to be analysed.

On 15th January 2014, the European Parliament adopted a package of three new public procurement directives, which after 24 months form the date of publication in the Official Journal of the European Union shall replace the Public Sector Directive (Directive 2004/18/EC) and the Utilities Directive (Directive 2004/17/EC). The new Directives represent an intention of far-reaching reform of the regime by focusing on the strategic use of the procurement rules, shifting to full e-procurement and introducing new procedures. The new Directives are also aiming at facilitating access to contracts for small and medium-sized companies, supporting strategic use of public procurement for environmental and social policy goals, and providing more clarity on the application of the rules.

According to the Commission analysis of the SME market an estimated 60 per cent of above-the-threshold contracts were won by SMEs. In terms of the value of the contracts, this corresponds to a 33 per cent market share.[9] However, both European and national reports list barriers in the access of SMEs to the EU market. [10-14] The most significant ones are the following:

- contracts too large for the capacity and financial standing of companies,
- lack of sufficient sources of information about participation possibilities for SMEs,
- excessive financial requirements concerning guarantees and security related to participation in the award procedure and execution of contracts,
- insufficient time to prepare documents for the tendering procedure,
- excessive requirements, such as certificates,
- high cost of obtaining such certificates as well as substantial financial burden including a tender security deposit, and providing security for the execution of the contract upon the request of the contractor,
- strict requirements for technical standards of the object of the contract,
- delayed payments from the contracting authority,
- sub-contracting instead of contracting, which limits the influence of SMEs on the execution of the object of the contract as well as their remuneration,
- unclear and ambiguous award criteria.

During public consultations with SMEs, they pointed out that in order to facilitate SME access to public procurement, a change in the procurement culture of the contracting authorities is needed rather than legislative changes in the public procurement directives.[8]

1.2 The principles of the Common Market and SMEs

In the public procurement system, the most important regulations refer to non-discrimination and equal treatment of all enterprises. [15] These rules, along with the fundamental freedoms of the Common Market, are the pillars of the EU legal system. These principles, derived from the Article 18 Treaty on the Functioning of the European Union, are also stated in the preamble and the text of the procurement directives. Article 2 of Directive 2004/18/EC and Article 10 of Directive 2004/17/EC provide that: “contracting authorities shall treat economic operators equally and non-discriminatory and shall act in the transparent way.”

The equal treatment principle means that all enterprises should be treated equally and all direct and indirect forms of discrimination are prohibited. [15-18] Examples of different forms of discrimination are found in various judgements of the Court of Justice of the European Union (CJEU), which abolishes all forms of discrimination based on nationality and equivalent measures. [19] Derogations from the fundamental freedoms are enumerated in the Article 36 of the Treaty on the Functioning of the European Union and refer to public interest exceptions such as, among others, public morality, public security, and public health. The use of derogations is subjected to a number of conditions. No exceptions are given for the preferential treatment of small and medium-sized enterprises. The provisions of the primary law of the EU have been interpreted and supplemented by the judgments of the Court of Justice of the European Union. Even if the Treaty derogations are not applied, the CJEU has recognized that a measure does not infringe the principles of the Common Market if it can be justified on the basis
The test examines whether national measures can be applied provisionally and temporarily, particularly in the form of effective fiscal supervision, health care, fair trade, and consumer protection. This is a non-exhaustive list which the CJEU may extend if it considers it appropriate with a view to a particular public interest. However, the principle of overriding national interest should be interpreted narrowly. Such measures are also subject to the proportionality principle, which requires that any restriction on trade should be suitable to promote the objective sought and it should also be necessary to achieve that objective. The Court of Justice of the European Union addressed the issue of mandatory requirements by analysis of the situation of SMEs which were excluded from large-scale procurement contracts, but this fact did not allow the Member State to adopt restrictions on the freedom to provide services by introducing national or regional preferences or special treatment of enterprises. [21]

The CJEU introduced criteria for the justification of non-discriminatory restrictions with reference to an overriding public interest in the so-called “Gebhard test.”[22] The test examines whether national measures can be applied based on an overriding public interest ground. The four conditions to be met are: (1) the measures should be applied in a non-discriminatory manner, (2) they must be justified by imperative requirements of public interest, (3) they should ensure the attainment of the objective which they pursue, and (4) they must not go beyond what is necessary to achieve this objective. Once all criteria of the Gebhard test of proportionality are met, the measures can be treated as an overriding public interest and justified. However, it seems that national regulations favouring SMEs as set-asides do not fulfill all conditions of the Gebhard test and may not be treated as an overriding public interest ground. [23]

Thus, it must be stated that the TFEU free movement rules shall be applied to the industrial policy of the EU and, in that sense, also to all regulations addressed to enterprises. With reference to the role of the State in the national economy, a distinction is made here between government as purchaser and government as regulator. The government in the role of a purchaser usually tries to promote industrial policies, while in its regulatory capacity the government is mainly interested in using the procurement policy as a tool (instrumentalization). However, the question still remains how the national discretion to implement horizontal policies is affected by the public procurement directives. The general principle, reflected in some CJEU rulings, that economic objectives cannot form the basis for justifying measures hindering access to the market, should be criticized.

Another important aspect of legitimate forms of support for small and medium-sized enterprises arises in the context of state aid for the presented types of economic activity. The CJEU considered this issue in the context of an Italian legal regulation which reserved 30% of supply contracts for enterprises established in the Mezzogiorno region,[24-25] It was argued that such state aid was permissible under TFEU exemptions from the general prohibition of state aid in the EU. The derogations of Article 105(3)(a) offer the possibility to authorize state aid by region. [26] Thus, as long as it was possible, the Member States overused their competences to introduce some non-discriminatory measures which were necessary to meet the mandatory requirements, particularly in the form of effective fiscal supervision, health care, fair trade, and consumer protection. This is a non-exhaustive list which the CJEU may extend if it considers it appropriate with a view to a particular public interest. However, the principle of overriding national interest should be interpreted narrowly. Such measures are also subject to the proportionality principle, which requires that any restriction on trade should be suitable to promote the objective sought and it should also be necessary to achieve that objective. The Court of Justice of the European Union addressed the issue of mandatory requirements by analysis of the situation of SMEs which were excluded from large-scale procurement contracts, but this fact did not allow the Member State to adopt restrictions on the freedom to provide services by introducing national or regional preferences or special treatment of enterprises. [21]

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The idea of free and unlimited competition is concretized by the best value for money principle in all tendering procedures. The contracting authorities are obliged to consider almost exclusively the economic aspects of bids and exemptions are interpreted strictly. The above remarks refer to an ideal form of the free market, but nowadays reality seems to be far more complicated. The Member States are often tempted to use public procurement as a tool for their protectionist policies. In the past, numerous preferences for national products or services or for particular regions or national enterprises were directly introduced to national legal systems, but, finally, following interventions of the Commission and then the Court of Justice of the EU, preferential treatment was abolished. [28-32] Thus, as long as it was possible, the Member States overused their competences to introduce some non-economic goals to the public procurement system. Some of those aspects were lately implemented in the legal public procurement system, such as environmental protection or special preferences for the disabled. In this evolution of the strict interpretation of the economic principle of public procurement as its main and only aim, one can see the result of a European-wide debate on the possibility and limits of instrumentalisation of public procurement.[33]
In general, some types of non-economic objectives are legal and compliant with the TFEU fundamental freedoms. Thus, one could formulate an open question whether the legal system of public procurement in Europe is effective. The Member States in their national regulations for under-the-threshold contracts are not bounded by European legislation, but they should apply all the basic rules of the Treaty. [3] An alternative view is presented by S. Arowsmith and P. Kunzlik, who stated that: “equal treatment in the procurement directives is different from the equal treatment derived from the Treaty” [25]. In this context, the question arises whether it would be possible to legalize those preferences which are used as a tool to combat unemployment and reduce economic fluctuations in the domestic market. The acceptance of some forms of promotion for domestic companies does not automatically mean hindering access to the domestic market. This can even constitute the legalization of a common practice and a form of removing obstacles to better access to public contracts for SMEs. A legal system which is inflexible and introduces excessively detailed regulation is ineffective and likely to be violated. In such a situation, the exigencies of economic life necessitate amendments to the legal system. Enforcement of legal regulations is often difficult for a variety of reasons, but one of the most important seems to be incompatibility with practice. Legal regulations without penalties attached are also ineffective, so it is of high importance to introduce rules with a possibility of imposing penalties, especially fines. As we have learnt from the lesson of competition law, the legal system started to be effective when Regulation No. 1/2003 and Regulation No. 139/2004 came into force, introducing the involvement of national institutions and severe financial fines.[34]

3. Soft legal regulations and SMEs

The role of SMEs in the public procurement system is not addressed in European legislation. The European Commission has published only guidelines referring to the promotion of small and medium-sized enterprises, in which the importance of better access to public contracts is pointed out. [35] In 2008 the European Commission adopted the Small Business Act for Europe, [36] which reflects the Commission’s political will to recognize the central role of SMEs in the EU economy. The act aims to improve the overall approach to entrepreneurship and to promote the growth of SMEs by helping them tackle the problems hampering their development. The new approach of the Commission to SMEs was presented in November 2011. The document presents a list of initiatives already taken and proposed for the future. In the updated Small Business Act, new legislative initiatives are to be adopted, for example: a directive on e-invoicing, an optional cash accounting scheme, or the requirement for public authorities to pay within 30 days as a security guarantee for SMEs. It is also suggested that the administrative burden for SMEs accessing public procurement should be reduced and SMEs should have better opportunities for joint binding. The Commission will even seek, wherever possible, to exempt microenterprises from EU-legislation or introduce a special regime in order to minimize the regulatory burden on them.

In helping SMEs benefit from the Single Market, the Member States are especially invited to fully implement the “European Code of Best Practices Facilitating Access by SMEs to Public Procurement Contracts,”[11] which was issued in 2008. The Code is meant to assist public authorities in developing strategies and programmes facilitating SMEs’ access to public procurement. The idea of the code was to create in the Member States a more SME-friendly public procurement policy, which still needs to remain in conformity with the European Union principles. The Code points out that contracts can be divided into lots for better accessibility for SMEs. The splitting of a contract into lots must not lead to the avoidance of application of EU directives and the value of separate lots has to added up to determine the level of EU legal requirements. Also the Communication of the Commission of 13 April 2011 titled “The Single Market Act: Twelve levers to boost growth and confidence”[37] mentioned the importance of SMEs for the development of the Common Market. It was also stated that a revised and modernized public procurement legislative framework would make the award of public contracts more flexible and enable the contracts to be put to better use in support of other polices.

In 2011, proposals for new public procurement directives were adopted. [38] They were intended to reinforce the “Europe 2020 strategy for smart, sustainable and inclusive growth.” [39] It was pointed out that public procurement plays a key role in the Europe 2020 strategy as one of the market-based instruments that promote the main goals of the strategy by improving the business environment and conditions for innovative business and encourage a wider use of green procurement. The current, new package of directives on public procurement is designed to reduce the administrative obstacles and costs related to tendering, make the procurement system more transparent and introduces the strategy by improving the business environment and conditions for innovative business and encourage a wider use of green procurement. The current, new package of directives on public procurement is designed to reduce the administrative obstacles and costs related to tendering, make the procurement system more transparent and easier for SMEs, and encourage the use of e-procurement to simplify the process. In January 2014, the new legislative package for the public procurement system was finally adopted. It consists of the three directives:


The directives will enter into force 20 days after publication in the Official Journal of the European Union. After this date, member States will have 2 years to implement the provisions of the new rules into national law.

4. SME-friendly legal provisions in the EU and Polish legal systems

Analysis of the current legislation leads to the conclusion that the European principles of equality prevent the application of clear preferences for the SME sector. An increase in the share of SMEs in public procurement may only take place by the application of transparent procedures, the reduction of the financial burden on the participants, and the implementation of training measures, which would ensure equal chances for all participants. In this context, the main SME friendly measures shall be presented, which are regulated by both European and domestic legal systems.

4.1 Subdividing contracts into lots

The public procurement directives allow contracts to be awarded in the form of separate lots (Article 9 (5) of Directive 2004/18/EC and Article 17(6) (a) of Directive 2004/17/EC). This clearly facilitates SMEs’ access to public procurement contracts and also broadens competition. However, the contracting authorities must respect the general legal rules concerning non-discrimination and are not allowed to split contracts into lots to avoid the application of public procurement regulations on above-the-threshold contracts.

The new Directives on public procurement also mention division into lots, which would make contracts more accessible for SMEs. This legal regulation even points out that if a contract is not subdivided into lots, the contracting authority will be obliged to provide a detailed explanation.

Article 32 of the Polish Act on Public Procurement Law [40] specifies the possibility to split a contract into lots for organizational, economic or technical reasons, or due to the financial capacity of the contracting authority. Thus, two options are possible: (1) tendering for lots or (2) each of the lots may be the object of a separate contract. Due to the fact that the value of the contract equals the aggregate value of all lots, individual lots are subject to the same procedure as the contract as a whole. The contracting authority may not split a contract into lots or understated its value with a view to avoiding the application of the provisions of law.

It should be pointed out that subdividing contracts into lots is in general positively received by SMEs as a measure which allows many companies to be awarded contracts. However, it should be regulated at least at the level of specification of the object of the contract, so that also the qualification criteria should be adequate to the partial value and scope of the contract.

4.2 Subcontracting

Small and medium-sized enterprises are invited to act as subcontractors, even if it is economically optimal for them to win contracts for themselves. Subcontracting is usually regarded as less profitable for economic operators due to lower profits. However, in large-scale contracts, SMEs are not able to assume the position of main contractors or even bid jointly with other SMEs, so in such cases subcontracting may still provide them with good opportunities.

Subject to national legislation, the contracting authorities may stipulate that the main contractor must not deal with its subcontractors on less favourable terms than those agreed upon the between the contracting authority and the main contractor. In this context, it is worth mentioning German legislation, where the contracting authority has to stipulate in the documentation that the successful tenderer may not impose less favourable conditions on its subcontractors than the conditions agreed with the main contractor, especially as far as payment arrangements are concerned.

The new Directives on public procurement state that the Member States may enable subcontractors to request direct payment by the contracting authority for the supplies, works and services provided to the main contractor. This regulation is intended to increase the efficiency of protecting the payment interests of SMEs. Among other measures, contracting authorities will have to explain in the Official Journal of the European Union advertisement why they did not split up the works or services into lots in cases when the procurement could have been so divided but has not been (‘apply or explain’ principle).

On the other hand, subcontracting cannot become the main form of facilitating access to the procurement market for SMEs. Polish legal regulations allow subcontractors to present their knowledge, experience, as well as appropriate technical potential and personnel capable of performing the contract. In some pathological award procedures,
this may lead to instrumentalisation of public procurement by, e.g., the common use of one curriculum, tools and personnel by numerous enterprises. Thus, it should be noted that the positive effect of subcontracting could be decreased by manipulation and collusion of enterprises.

Subcontracting does not necessarily mean good performance of the contract and sufficient payment for the subcontractors as the general contractors often take advantage of their dominant position and impose rather unfavourable financial terms. The problem is of great importance, especially in the construction sector, as in Poland the main award criterion is the lowest price. The tenderers often offer abnormally low bids, which theoretically should be rejected, but in practice it is a common form of combating one’s competitors and a means of winning a contract. The negative consequences of the execution of contracts awarded close to the limit of profitability are, unfortunately, passed on to the subcontractors.

In Poland, civil agreements on the performance of a contract are concluded only between the contracting authority and the general contractor. All obligations between the general contractor and subcontractors are regulated by the Civil Code. In practice, this means that in the case of delayed payments or bankruptcy of the general contractor, all the subcontractors can do is initiate civil law proceedings.

The recently adopted Polish Act on the payment of outstanding receivables of enterprises for selected works performed due to awarded public contracts [41] is addressed specifically to the group of small and medium-sized enterprises that executed motorway construction contracts. The act is designed to cover the claims of the small and medium-sized enterprises that were subcontractors in large-scale road construction projects. As the act preferentially treats a particular sector and group of enterprises, it should be carefully investigated whether it is in conformity with equality of treatment and public aid rules. Lately adopted amendment to the Polish Act on Public Procurement Law impose on the contracting authority an obligation of requirement of the subcontracting agreement from the general investor and enable subcontractors to request for the direct payment.[40]

### 4.3 Framework agreements

Pursuant to the public procurement directives (Article 32 of Directive 2004/18 and Article 14 and 40 (3)(i) of Directive 2004/17/EC), the contracting authorities can conclude a framework agreement with several economic operators, which is another possibility of promotion of small and medium-sized enterprises. This is especially the case if a framework agreement involves a large number of economic operators and it is subdivided into lots or if contracts based on a framework agreement are awarded in the form of lots.[11]

According to the Polish Act on Public Procurement, the contracting authority may conclude a framework agreement after conducting a procedure applying, as appropriate, the provisions concerning contract award by open procedure, restricted procedure, or negotiations with publication (Article 99). A framework agreement is defined as an agreement concluded between a contracting entity and one or more contractors. Its main aim is to establish terms and conditions, and especially prices, for public contracts that may be awarded in a particular period. As a result of concluding such an agreement, contracts may be awarded on a simplified basis and on terms not worse than those set down in the framework agreement. On the other hand, SMEs complain that once a framework agreement is concluded, they do not have any possibility of accessing the contract during the term of the agreement.

### 4.4 Functional requirements in the description of the object of the contract

One of the possible forms of the promotion of innovation in public procurement is defining technical specifications in terms of performance or functional requirements (Article 53(1) of Directive 2004/18/EC and Article 55(1) of Directive 2004/17/EC). The directives allow the contracting authority to specify the object of the contract not only in the form of enumerated requirements and a very detailed list of technical specifications and standards, but also in the form of a general description. Thus, the aforementioned regulation allows enterprises to present a variety of technical solutions which are available in the marketplace. The bidders are not limited by the provisions of a technical specification, but can present new and innovative solutions which correspond to the needs of the contracting authority. This legal solution concerning description of the object of the contract may promote innovative SMEs, especially in the IT sector.

The second possibility to promote new and unknown products or services is offering variants. In such a case, the contracting authority has to specify in the contract documents the minimum requirements to be met by the variants and the form of their presentation.

Polish legal regulations allow for description of the object of the contract without referring to approvals, technical specifications, and reference systems (Article 30). The object of the contract is described by its functional character, while environmental impact characteristics may be also included. Such an approach can broaden the scope of
contractors by allowing bids from companies which find it difficult to define their products and methods in line with the existing standards and technical specifications, but are able to meet the expectations of the administration in terms of execution of the contract.

4.5 Consortia of enterprises

The European legal regulations allow bids to be submitted by groups of enterprises often called consortia (Article 4 (2) of the Directive 2004/18/EC). Contracting authorities may not stipulate special conditions for participation of such groups in procurement procedures that would not be imposed on individual candidates. Consortia may not be required to assume a special legal form to submit a tender or a request to participate. However, the contracting authority may stipulate some special conditions for the performance of the contract by a group, which may require the group to assume a specific legal form once it has been awarded the contract. This provision should be applied to the extent that this change is necessary for the satisfactory performance of the contract. The new directive additionally stipulates that conditions for participation of groups of economic operators must be proportionate and justified by objective reasons (Preamble, article 16 and 71).

The EU legal system does not specify in detail how a consortium is to be established, so the legal form of cooperation between enterprises for the submission of a bid is up to the economic partners. Enterprises must establish a representation for the consortium and its scope, which is to be concretized at the level of the national legislation. A set of different provisions applies to the execution of the contract, in which the contracting authority may introduce the obligation to establish a special legal form, but only insofar as it is necessary for the satisfactory performance of the contract. Thus, economic operators are allowed to reject the proposal of the contracting authority to assume a specific legal form on the grounds of, e.g., additional expenditures or reciprocal payments. An interesting legal problem is connected with the admission of changes in a consortium’s membership as well as the scope and period of such modifications. In the case of Makedoniko, changes in the consortium were introduced after the award of the contract, but the Greek contracting authority excluded it from the procedure pursuant national regulations. [42]

The European Court of Justice has stated that the acceptability of changes in consortia shall be regulated by national legislation. Abolishment of changes in consortium membership may be based on the requirement of effectiveness of the award of contracts, which could be breached by changes introduced to the technical potential, financial standing, or reliability of the contractor.[43]

In the Polish legal system, contractors may bid for a contract jointly by establishing a consortium (Article 23 of Act on Public Procurement). Consortia are structured similarly to private partnerships. The contractors, who are parties to a written agreement, shall be jointly and severally responsible for the execution of the consortium agreement and contributing security to ensure the proper performance of the agreement. The regulation allows for shared responsibility for the execution of a contract. Once one of the members of the consortium has presented the required qualifications and technical and financial capacity, the whole consortium is deemed to meet that requirement of the contracting authority. However, all consortium members are evaluated separately in respect of exclusion from the contract award procedure. The possibility to establish a consortium can encourage SMEs to conclude this type of an agreement for joint application in tendering procedures. In practice, many questions arise, e.g., how to attract companies to conclude an agreement, how to arrange risk sharing, and how to formulate common economic objectives. Companies in good financial standing are not usually interested in forming a consortium, which would imply sharing the remuneration. However, it is an attractive solution for companies in less advantaged financial or technical standing or for groups of companies in which each partner can meet only part of the requirements.

4.6 Abolishment of discriminating against contractors on the grounds of their qualifications

According to the directives, the criteria for financial and economic activity and for technical ability need to be related and proportionate to the subject matter of the contract (Article 44(2) of Directive 2004/18/EC). The idea of proportionate selection criteria is very important for SMEs, as contracting authorities which set the capacity and ability levels too high exclude many of them from participation.

European legislation on public procurement allows an economic operator to rely on the economic and financial capacity and technical ability of other companies for proving compliance with the capacity and ability levels required by the contracting authority (Article 47(2) (3) (4) and article 52(1) of Directive 2004/18/EC and article 53 (4) (5) and article 54 (4)(5) of Directive 2004/17/EC). It should be mentioned that the economic operator must prove that it will have at its disposal the resources necessary for the execution of the contract. A group of economic
operators may rely on the capacity of all its members. It is even possible for a group to also rely on the capacity of entities which are not its members. The Code of Best Practices indicates that it is advisable for contracting authorities to draw attention to this possibility in the contract notice or even in a prior contract notice in order to give enterprises more time to prepare for joint bidding. The above-mentioned provisions are aimed to facilitate the formation of groups of independent contractors, especially in the case of complex contracts.[11]

An important obstacle to SME participation in public procurement is posed by disproportionate financial guarantees required by the contracting authority. Also unjustified and prolonged retention of resources in the form of, e.g., participation guarantee of an economic operator, should be avoided. In Polish legislation, the amount of a participation guarantee may not exceed 3 per cent of the value of the procurement contract.

The contracting authority may exclude candidates and tenderers from a procedure, thus eliminating time-consuming procedures that would otherwise involve many enterprises not meeting the selection criteria such as adequate financial standing or professional and technical qualifications. The contracting authority is bound to exclude form the procedure all those who have been convicted by a final judgement, which refers to, e.g., participation in a criminal organization, corruption, fraud to the detriment of the financial interests of the EU and money laundering. Also excluded are enterprises falling under the following categories: bankruptcy, offences concerning professional conduct, non-payment of taxes and social security contributions, breach of environmental regulations and serious misinterpretation of certain documents (Article 45(1) and (2) of the Directive 2004/18/EC). However, in their domestic legal systems the Member States can decide about the conditions of those exclusions and sustainability checks. The national law regulates the details, the scope of the required documents, and their form.

In the new legislative package, it is additionally stressed that the contracting authority should be given the possibility to exclude candidates or tenderers for violation of environmental and social obligations, including accessibility for disabled persons, or other forms of grave professional misconduct, such as violations of competition rules or of intellectual property rights (new directive form 2014, Preamble 34 and 35). The new legislation is also intended to introduce the possibility for economic operators to adopt compliance measures aimed at remedying the consequences of criminal offences or misconduct and effectively preventing further occurrences of misbehaviour. These measures may especially consist of personnel and organizational measures, such as staff reorganization, implementation of reporting and control systems, or the creation of an internal audit structure. In the case of implementation of such measures, the economic operator should no longer be excluded on these grounds. It should be added that the above-mentioned regulation would strengthen the position of tenderers, but in extreme situations this can prevent exclusion of contractors who have committed a crime or grave misconduct.

In the new Directives on public procurement (Preamble 31 and 32) the importance of simplifying the information obligation is presented as a measure increasing SMEs opportunities for being awarded contracts. It provides for the mandatory acceptance of self-declarations as evidence for selection purposes. The production of documentary evidence is intended to be facilitated by a standardized document, the so-called European Procurement passport which is a proof of the absence of grounds for exclusion. The new legislation also intends to introduce a limitation on the requirements for participants and contains an exhaustive list of possible conditions for participation in procurement procedures. It states that such conditions should be restricted to those that are appropriate to ensure that the candidate or tenderer has the capacity and ability to perform the contract to be awarded. An example of an SME-friendly solution is the provision that turnover requirements must be limited to three times the estimated contract value (except in duly justified cases).

In Polish contract award procedures, the contracting authority may request contractors to supply declarations or documents necessary to conduct tendering procedures (Article 25 of Act on Public Procurement Law). Declarations or documents proving compliance with conditions for participation in the procedures and conformity of the supplies, services, or construction works offered should be indicated by the contracting authority in a contract notice, a specification of essential terms of the contract or an invitation to submit tenders. The 2009 amendment of the Act on Public Procurement Law introduced another regulation important for SMEs. The contractor may prove compliance with the contracting authority’s requirements not only by ownership of technical equipment, employment of qualified personnel, or presentation of documents proving its financial standing, but also by proving that it has these at its disposal. Thus, the bidder is allowed to present a written obligation from another enterprise to provide the required equipment or human resources. The above-mentioned legal solution is aimed to encourage SME participation in tendering procedures by easing the strict requirement of ownership of equipment or employment of personnel. However, this solution has also been criticized by contracting authorities because of cases of abuse. In practice, in an extreme situation very small enterprises could participate in tenders without authorization to perform specific activities, knowledge, experience, appropriate technical and personnel potential as well as economic and financial standing if only they can present proof that they have these at their disposal from other companies. This could create collusion between the enterprises aimed at price fixing or division of the market.
Moreover, in this way companies which cannot participate themselves in the procedure due to exclusion from contract award could in practice execute the contract. The conditions of exclusion from the award procedure are enumerated in Article 24 of the Act on Public Procurement Law, which presents a list of categories of excluded contractors, including enterprises that caused damage by failing to perform a contract, contractors in arrears with the payment of taxes, other charges or social and health insurance contributions, or both natural and legal persons who have been sentenced by a final judgment for an offence committed in connection with contract award or for other offences (e.g. bribery, offences against economic turnover or environment, or any offence committed with the aim of gaining financial profits).

4.7 E-procurement

The main idea of e-procurement stipulated in the directives is to promote cheap and fast communication and transparent award procedures (Article 1(7), (13), Article 33, Article 42(1), (4), (5), Article 54 of Directive 2004/18/EC; Article 1(5), (6), (12), Article 15, Article 48(1), (4), (5), Article 54; and Article 56 of Directive 2004/17/EC). All Member States have introduced national public procurement websites to enable search for contracts notices as a result of implementation of a Europe-wide strategy for the development of e-procurement [38] and the declaration to promote procurement by electronic means presented in the Digital Agenda for Europe.[39] In 2012 the Commission adopted “The Strategy for e-procurement”, which shall be the road-map for the implementation of e-procurement in Europe (COM/2012/179). However, in many countries it is still difficult for tenderers to monitor notices and receive relevant information. In that context, the following measures can be suggested to increase e-procurement: publication of all public procurement notices online, creation of a single centralized website for public procurement, free access to notices, a multifunctional search engine, the possibility for SMEs to receive alerts of notices in their field of economic activity, direct downloading of contract notices and tender documents, and an electronic tendering facility enabling the contracting authority to receive bids electronically ensuring the integrity of information, confidentiality, and appropriate access.[11]

One of the main aims of the new European legislative package on public procurement is to promote e-procurement in terms of the entire award procedure. The Commission also intends to manage a mandatory electronic system called e-Certis, which is aimed to facilitate exchange of certificates and other documentary evidence required by contracting authorities.

The promotion of e-procurement could be illustrated by the idea of creation of a public procurement information platform which would provide a unified pan-European system creating an aggregation of tender notices linking open data and semantic web technologies. This platform requires a multistep method to deal with the requirements of the public procurement sector and the open government data initiative: (1) modelling the unstructured information included in public procurement notices; (2) supplementing that information with the existing product classification systems and the linked data vocabularies; (3) publishing relevant information extracted from the notices according to the linking open data approach. Public procurement notices contain a variety of data such as type of contract, region, duration, total amount, and target enterprise. Various methods can be applied to expand user queries, facilitate access to information, and provide more accurate information. Expanded user queries can involve extra time in the process of retrieving notices. Moreover, the platform is also supposed to be especially relevant to SMEs that want to tender in the EU, easing access to information on notices and fostering SME participation in cross-border public procurement procedures across Europe.[40]

The Act on Public Procurement Law in Poland enables e-procurement, but the actual application of the legal possibilities is insufficient.[41] The Act regulates electronic auctions as well as electronic communication for procurement procedures, but those measures are applied relatively rarely. It is believed that e-procurement and the use of electronic communication can deliver economic savings, eliminate errors and reduce waste. The main problems are related to the national regulations on electronic signature and the extended process of adoption of the new Act on electronic signature, which is meant to reduce administrative burden on the development of e-commerce and e-procurement. In 2012, only 359 electronic auctions were organized on the Electronic Auction Platform managed by the Polish Office of Public Procurement.[48] In comparison with Portugal, where almost all tendering procedures are conducted by e-procurement, Polish legislation requires significant changes to make electronic procurement attractive for contracting authorities and contractors. The currently discussed amendments aim to implement a 3-step program of e-procurement promotion (elimination of legal obstacles to increase the use of electronic auctions and electronic communication, development of the Electronic Auction Platform and a fully electronic procurement procedure). It is planned to introduce a fully electronic tendering procedure for almost all tenders within 4 years.
4.8 Best value for money as the main award criterion

The contracting authority can encourage SME participation in tenders by adopting award criteria such as the economically most advantageous offer rather than the price-only criterion. Employing the principle of the economically most advantageous offer, the contracting authority can evaluate, besides the price, also additional criteria, such as after-sale services, technical assistance, technical merit, functional characteristics, cost-effectiveness, running costs, or even quality or innovative solutions. In the above-mentioned form of contract award, life-cycle costs are taken into consideration along with the direct cost of purchasing goods.

The new 2014 Directives directly formulate the rules for life-cycle costs of the products, services or works. The life-cycle covers all stages of the existence of the object of the procedure. The costs to be taken into account include direct monetary expenses or external environmental costs which are to be calculated under the common European methodology. However, it should be observed that the application of life-cycle costs may imply additional costs and sometimes even barriers for SMEs. However, the use of different life-cycle cost methodologies detracts from the generally positive assessment of the proposed legislation. In the absence of one common European methodology for life-cycle cost calculation, the contracting authorities will be obliged to accept offers based on different methods as long as the contractor can prove that his method fulfils the requirements enumerated in the directive and is comparable with the methodology adopted the contracting authority. This regulation can lead to higher costs and a longer period of preparation of documents, and even to numerous appeals resulting from potentially discriminatory treatment of contractors. Thus, the application of this regulation entails problems with the recognition and comparability of life-cycle cost methods.

5. Conclusions

The benefits of SME participation in public procurement can be divided into benefits for the contracting authority and benefits for the economy and society. The benefits for the administration are lower costs of goods and services, better quality, flexibility, and specialization. The benefits for the economy and society include greater competition in the market, innovation, lower unemployment, and economic growth. The main disadvantage for SMEs is the relatively high cost of participation in the public procurement market.[49]

Based on a general assessment of the public procurement market, the conclusion can be drawn that public procurement rules directly or indirectly addressing SMEs do not distort competition in the Common Market. The Member States are allowed to introduce measures or even SME-friendly policies for the award of under-the-threshold contracts. However, national legislation must respect the principles of state aid. It that context, it could be still disputable whether SMEs can benefit from state aid, a social clause, or innovation promotion. Non-economic aspects can be included at the various stages of the procedure by implementation of environmentally friendly solutions or a social clause with preferences for persons threatened with social exclusion. Other provisions, e.g., regarding combating unemployment, can be adopted in the execution phase of the contract.

The question still remains whether SMEs could be the object of state aid in the form of procurement preferences. Small and medium-sized enterprises are the main business beneficiaries of the European Union structural funds. The main forms of state aid, such as preferential loans, tax relief, consultancy and training, are addressed to micro-companies. This has been sometimes criticized as support should be rather addressed to high technology sectors and multinational corporations. On the other hand, SMEs are especially active in biotechnology, IT science, electronics, environmental protection, green technologies, sophisticated technical services, consulting, and legal advisory services as well as in so-called creative sectors which combine business with art and culture and even computer games. However, venture capital and private equity funds seem to be a good form of supporting new and creative enterprises and may be a far more effective form of public spending. Otherwise, structural funds would be distributed in an ineffective way and without added value.

In the proposed amendment to the Polish Act on Public Procurement Law, numerous measures are introduced to enable wider access of SMEs to the public procurement market. Similarly to the EU directives, the Act on Public Procurement Law does not stipulate any preferences for SMEs as regards awarding public contracts. In the official justification, it is stated that many barriers faced by SMEs in terms of access to public contracts have already been removed by appropriate provisions in the proposed amendment. The main problems are probably connected with insufficient knowledge about SME-friendly regulations among enterprises and contracting authorities.[50]

The most important measures proposed to promote SMEs in Poland include splitting bids into lots, the requirement that subcontracting specifications should precisely define conditions of participation for subcontractors, and the possibility to impose an obligation on concessionaires of public works to award 30% of their contracts to
subcontractors. According to the assumptions formulated in the justification of the proposed amendment, the main trends in the development of public procurement in Poland are connected with increased participation of SMEs in public procurement, increased demand for innovative products, environmentally friendly solutions in public procurement, increased implementation of electronic measures in the procurement system, and inclusion of social clauses in award procedures.

In reference to the presented analysis of legality of any preferences for SMEs in the procurement market, some remarks should be made on the relationship between SMEs and various possible violations of the law, which may not be justified. The level of risk of illegal arrangements between the contracting authority and the contractors, as well as between private bidders, still remains significant. It should be mentioned that contracting authorities should have more possibilities to exert influence on subcontracting. Despite the generally positive role of subcontracting in the public procurement system, it is in practice often reported that subcontracting can be a method of distributing collusive gains and often reduces the quality of contract performance, which is lower than that declared by the main contractor. The national regulations of the Member States or the guidelines implemented by the contracting authorities themselves are aimed to minimize the above-mentioned risk by some measures, including: abolishment of subcontracting for very innovative bids which require technical merit and highly qualified personnel, obligatory requirement of self-performance of contracts based on intellectual property rights, and a mandatory requirement included in the contract notice to present a list of subcontractors.

One of the possible solutions for combating corruption could be a higher level of involvement of the bidders who were not awarded the contract in its execution. In this context, splitting contracts into lots seems to be a viable method of combating fraud.

The legal system regulating public procurement both on the European and national levels seems to be still ineffective in ensuring the best value for money. Numerous amendments to the current legislation, the new legislative package, and almost 200 judgements of the Court of Justice referring to the various aspects of the issue still remain insufficient to fully implement the Common Market. The present system is overregulated and sometimes does not correspond to economic practice. In the author’s view, the public procurement system should be deregulated, especially in the face of the economic crisis and the rapid development of non-European economies resulting in worldwide competition. European legislation should govern the main aspects of the procedures, leaving greater discretionary powers to the contracting authorities, which should be assisted by the Purchasing Institutions in all Member States. Direct responsibility of political decision-makers at the contracting authorities for award procedures should not only be implemented but also efficiently executed in the case of breach of substantial elements of contract awards. However, the most important aspect of combating fraud, corruption, and all illegal arrangements is increased control of the execution of contracts.

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MEASURING EFFICIENCY IN INTERNATIONAL PUBLIC PROCUREMENT

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ABSTRACT

Procurement efficiency as an element of public performance management can contribute to achieving Value for Money by reducing administrative overhead costs and directing resources to support more complex procurement processes. This paper highlights empirical techniques to understand determinants of efficiency in the procurement cycle focusing on elapsed time taken and drawing on a unique dataset on the procurement process within the World Bank. The study finds that different methods of bidding, whether international or domestic, and contract attributes partially explain differences in the duration of procurement processes.

INTRODUCTION

Getting good value out of public procurement is not just a question of getting goods at the best price, but also involves considerations of the costs incurred during the procurement process (see Burger and Hawkesworth (2011) among others). The concept of Value for Money (VfM) in public procurement, while not having a commonly accepted definition, typically involves considerations of “what a government judges to be an optimal combination of quantity, quality, features and cost, expected over the whole of the project’s lifetime” (Burger and Hawkesworth, 2011). The definition of VfM is now being broadened
to include measures that reduce the administrative overhead cost of procurement (DFID, 2011). In keeping with the broadened definition, from the perspective of public sector performance management, Boland and Fowler (2000) describe the concept of VFM as the "simultaneous optimization of both outcome effectiveness and resource use efficiency".

Public procurement also operates in a field of substantial political tension between performance and compliance, being tasked to fulfill public expectations of both transparency and efficiency. On the one hand, focus on compliance in transactions may distract from a focus on outcomes and need not ensure the containment of fraud and corruption, which could be a systemic rather than only project level issue. On the other hand, transaction cost reducing measures need to be balanced with demands for transparency and accountability.

This underlying tension between performance and compliance, and its effect on efficiency of the public procurement process, has been discussed extensively (see for example Schapper et al., 2006). Similar issues are also addressed in the vast body of literature on performance management. Kloot and Martin (2000) stress the need for consistency in public management between accountability and service delivery in a "cost-effective, high-quality manner". Reviewing performance management issues in local government in Australia they identify the "lack of measures to determine internal process performance as a hindrance to managing them". Their findings indicate that inability to estimate effects of process change effectively hampers reform, leaving personnel involved uncertain about how to proceed.

Time taken in the procurement process has also been discussed in a number of studies concerned with transition to more efficient procurement systems. In their review of procurement reform in the Greek governmental purchasing system, Panayiotou et al. (2004) analyze the average elapsed times for procurement activities based on data collected from historical tender documentation and procurement plans. Findings suggest delays in the procurement cycle with maximum lead times extending to two years, which is attributed largely to "idle time between activities" and leads the study to identify the time taken in the process as a key performance indicator for reform. Pagnato (2009) describes the reduction of the time needed to award contracts “an indirect goal of almost every reform”. Understanding time taken in specific steps throughout the procurement cycle helps illuminate where bottlenecks need to be
addressed and where resources need to be freed up to be put towards support of more complex procurement processes and professional development of best practices in the use of available options of procurement methods.

There remains a gap in the literature with regard to empirical measurement of efficiency in the procurement cycle, in the sense of elapsed time taken, which this paper seeks to address. This paper highlights some empirical techniques to understand determinants of this aspect of procurement efficiency drawing on a unique dataset on the procurement process within the World Bank collected as part of a review of World Bank Procurement, conducted by the World Bank’s Independent Evaluation Group (IEG). In summary, the study finds that different methods of bidding, whether international or domestic, and differences in review processes that accompany these methods, partially explain differences in procurement outcomes.

While the techniques and exercises used to measure procurement efficiency may not be fully generalizable to other public procurement contexts, they may still be salient as the WB procurement system shares the tension of compliance and efficiency with other public procurement systems. The World Bank’s Guidelines for procurement of works and goods were generally seen, in the IEG evaluation (IEG, 2014), as reasonable and adding value, however the Bank’s procurement processes were perceived to be time consuming and rigid. Further, the World Bank’s procurement guidelines were perceived to place more emphasis on safeguarding against risks to the integrity of the process than on efficiency and the cost of time lost.

The paper is organized as follows. Section 1 provides a brief overview of the procurement framework of the World Bank; Section 2 provides a description of the data collected; Section 3 highlights some of the techniques used in measuring procurement efficiency, and Section 4 concludes with a brief discussion of potential generalizability to other public procurement contexts.

THE WORLD BANK PROCUREMENT FRAMEWORK

The responsibility for the implementation of a project funded, in part or whole, by World Bank rests with the borrowing country and its implementing agencies. The World Bank is, however, required by its Articles of Agreement to “ensure that the proceeds of any loan are used only for the purposes for which the loan was granted, with due
attention to considerations of economy and efficiency and without regard to political or other non-economic influences or considerations*. In light of this fiduciary responsibility, the World Bank has established detailed guidelines for the procurement of goods and works and the selection of consultant services that need to be complied with by the borrowing country.1

Apart from fiduciary responsibility, the Bank's procurement guidelines also intend to apply best practices in public procurement, meant to achieve open and fair competition and a good level of market access. Many aspects of Value for Money principles are already implicit in Bank procurement; the Bank's guidelines make economy and efficiency the basis for project implementation of the project and point out the Bank's interest in giving all eligible bidders the same information and equal opportunity to compete. They encourage the development of domestic contracting and manufacturing industries in the borrowing country and emphasize the importance of transparency in the procurement process (World Bank, 2011a). In this regard, World Bank's procurement guidelines are often seen as shaping procurement practices around the world (see Debevoise and Yukins (2010) among others).

Within the framework of the World Bank procurement guidelines, the Implementing Agencies of borrowing countries can use a variety of procurement methods in World Bank funded projects. The method selected depends on a number of factors including the type and value of the good, work or service procured, risk perceptions of project or country entities and the state of development of local markets (World Bank, 2011b). For example, for Goods and Civil Works, for contracts below a certain specified value threshold, procurement is conducted through National Competitive Bidding (NCB) while contracts above the threshold need to be procured using International Competitive Bidding (ICB).2 One feature distinguishing ICB and NCB is described in Paragraph 3.4 of World Bank's procurement guidelines, stipulating that borrowers may limit advertising to the local press for NCB processes (World Bank, 2011c). NCB as a proportion of procurement methods applied has risen over time as countries' domestic supply capacities mature, i.e. NCB method threshold are higher to reflect the greater extent to which local suppliers are able to meet a given need of the contracts (see IEG, 2014).

The World Bank's role in procurement is enhanced for projects above certain monetary thresholds, as the procurement system requires the World Bank to review certain steps in the borrower's procurement
process and furnish its "No-Objecton" in accordance with the guidelines (see Table 1). This "prior-review" process is carried out by country office procurement staff, regional procurement managers or a central World Bank apex unit, depending on the complexity of the contract. Prior-review thresholds sometimes coincide with method thresholds for ICB and NCB. In most countries, however, large NCB contracts can also be subject to prior-review.

In addition, prior-review contracts are also subject to clearance thresholds, which determine who, in the Bank’s procurement hierarchy gives the relevant no-objections, with the largest contracts with values above $50 million being subject to clearance by the Operational Procurement Review Committee (OPRC). IEG (2014) analysis of Africa Region data finds that clearance at OPRC level implies longer processing times, partially reflecting the increased complexity of such cases. It has, however, been pointed out more generally in client interviews that referrals to higher levels in the clearance chain are perceived to cause delays (ibid.).

**TABLE 1**

"No-Objecton" Steps for Prior: Reviewed Contracts

<table>
<thead>
<tr>
<th>Simple Goods &amp; Works (ICB/NCB)</th>
<th>Two-Stage Goods &amp; Works (ICB/NCB)</th>
<th>Consultant Services (Quality and Cost Based Selection QCBS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Procurement Notice</td>
<td>Specific Procurement Notice</td>
<td>Expression of Interest</td>
</tr>
<tr>
<td>Draft Bid Documents</td>
<td>Draft Bid Document</td>
<td>Terms of Reference/Short List</td>
</tr>
<tr>
<td>Bid Documents as Issued</td>
<td>Bid Documents as Issued</td>
<td>Short List and Draft Request for Proposals</td>
</tr>
<tr>
<td>Bid Opening/Minutes</td>
<td>Technical Bids</td>
<td>Request for Proposals as Issued</td>
</tr>
<tr>
<td>Stage 1 Evaluation – Report/Minutes/Amended Bid Documents</td>
<td>Evaluation of Technical Proposals</td>
<td></td>
</tr>
<tr>
<td>Invitation to Stage 2 as Issued</td>
<td>Opening of Technical Proposals/Minutes</td>
<td></td>
</tr>
<tr>
<td>Stage 2 Bidding</td>
<td>Opening of Financial</td>
<td></td>
</tr>
</tbody>
</table>

5
Proposals/Minutes

<table>
<thead>
<tr>
<th>Bid Evaluation Report and Recommendation for Award</th>
<th>Bid Evaluation Report and Recommendation for Award</th>
<th>Combined Evaluation Report and Draft Negotiated Contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signed Contract</td>
<td>Signed Contract</td>
<td>Signed Contract</td>
</tr>
<tr>
<td><strong>Contract Amendment</strong></td>
<td><strong>Contract Amendment</strong></td>
<td><strong>Contract Amendment</strong> (In some cases)</td>
</tr>
<tr>
<td>(In some cases)</td>
<td>(In some cases)</td>
<td>(In some cases)</td>
</tr>
<tr>
<td>Contract Completion</td>
<td>Contract Completion</td>
<td>Contract Completion</td>
</tr>
</tbody>
</table>

Note: Steps requiring a "no-objection" are in italic font
Source: World Bank, IEG

The recent review of Bank procurement found that Bank processes of review and issuing of "No Objections" have been viewed as cumbersome, time consuming, prone to delay, and inflexible in interpretation. The Bank’s procurement system thus may not be achieving value for money despite sound guidelines, on account of the procurement process. Measuring the perceived inefficiency of the Bank’s procurement process thus becomes critical (see also Dener et al, 2011). In the next section, we highlight a unique dataset used to measure the efficiency of the Bank’s procurement process, using the time taken and the frequency of delays. In Sections 3 and 4, we discuss some empirical techniques to describe the underlying factors driving inefficiency in procurement, and their relative importance.

WORLD BANK PROCUREMENT EFFICIENCY DATA

Current World Bank procurement tracking systems only partially capture data that would permit the tracking of procurement efficiency and bottlenecks that may occur at different stages of procurement execution. The principal World Bank-wide source of procurement data is a web-based interface for entering contract information for World Bank-funded contracts. The key purpose is fiduciary; to ensure that a no-objection to the final bid evaluation report and a signed contract exist before disbursements are made. It also records the procurement method and contract award information including supplier names, nationality and eligibility status. The interface, however, does not cover all contracts and captures only the final stage of the procurement process: the date of the Bank’s no-objection to the contract award, and the date of contract signature. In effect,
the interface does not provide information capable of tracking processing time at different stages of the procurement cycle, a requirement vital to tracking efficiency.

Some World Bank regions, such as Latin America and Caribbean, use the Procurement Plan Execution System (alluded to by the acronym, SEPA), that focuses primarily on the monitoring and execution of procurement plans related to World Bank funded projects. SEPA's objective is to promote transparency in World Bank operations and to offer a procurement management tool to borrower governments. SEPA requires the input of core procurement dates and provides the option of tracking additional procurement steps. It is, however, a standalone system and some dates are inputted at the discretion of the borrower, thus introducing a high level of variability in available information by project and country, rendering the dataset unsuitable for global analysis of procurement efficiency.

The Procurement Cycle Tracking system developed in the World Bank Africa region, PROCYS, is a platform of communications between the principal parties involved in the procurement process on procurement processes for contracts subject to prior review. Each interaction or stage in the process is recorded, in terms of the number of days taken from the previous to the present stage. It thus tracks not only the total elapsed time between a borrower's first request for a no-objection, and receipt of the Bank's final no objection, but also the numbers of iterations between the Team Leader and borrower, between the Team Leader and different levels of procurement staff; from the field procurement specialist to the regional procurement manager and the Central Procurement Board. It currently covers over 460 projects in over 40 countries in the Africa region. PROCYS is principally used as a management information system that measures responsiveness of different participants in the procurement process.

The procurement portfolio dashboard that serves as a tool for the management of the Middle East & North Africa procurement unit’s resources (referred to as MNA-dash) emphasizes the execution of the region’s loan portfolio rather than the recording of individual transactions. This data repository is not interactive. Information is uploaded manually as reported. Contract level data, if any, is available only as a byproduct of other monitoring objectives.

In sum, the World Bank's principal centralized procurement system and the three regional procurement systems each have different objectives and architecture. While there is a wealth of information collected and analyzed for specific monitoring needs, the systems do
not provide necessary data to analyze efficiency of the procurement process across the World Bank. Specifically, the systems are unable to provide organization wide data to track elapsed times of realized individual procurement process steps.

Given the fragmented and regionally diverse information on procurement processes, a unique dataset was constructed to measure the efficiency of the World Bank’s procurement process with respect to the process of issuing ‘No Objections’ described in Table 1. The data sought to measure procurement efficiency in terms of the overall elapsed time in the procurement process, aggregated from the time elapsed between successive ‘No Objection’ steps, in each contract. The dataset also records other country and contract attributes that could potentially affect overall procurement efficiency. The sample for data on prior-reviewed contracts was constructed from a questionnaire surveyed in eleven client countries (Azerbaijan, Bangladesh, Ethiopia, Indonesia, Mexico, Morocco, Peru, Philippines, Senegal, Tanzania, Turkey), with at least two in each of the World Bank’s six borrowing regions, except the Middle East on account of its relatively smaller size. Based on a standardized template, data requested included, primarily, information on the dates of each step in the procurement process where the Bank is required to provide a “no-objection” to a client, in order to be able to track elapsed time between and across successive phases of procurement.

A representative stratified sample was attempted, by procurement method and category, by size, and across a sample of fiscal years from 2007 to the present. However, the response rate from country offices was highly variable in quantity and quality, ranging from 107 contracts for Azerbaijan to four from Tanzania. Out of 502 contracts for which data were received, only 201 had information on all date fields from the Issue of the Specific Procurement Notice to Contract Signature. Where possible, missing dates were filled in with information provided in the Bank-wide tracking system. The limitations of the dataset, in terms of selective response from countries and lack of complete information on dates, needs to be taken into account, when interpreting the analysis of procurement efficiency highlighted in the next section.
ANALYSIS OF WORLD BANK PROCUREMENT EFFICIENCY

Basic Sample Characteristics

In terms of sector categories, basic sample statistics show that the dataset is skewed towards infrastructure contracts. Data are distributed more evenly by procurement category, with Consultant Services, Goods and Civil Works each accounting for roughly one third of observations. In terms of procurement methods, contracts using International Competitive Bidding (ICB) form around 40 percent of the sample, while National Competitive Bidding (NCB) and Quality and Cost Based Selection of Consultants (QCBS) each contribute about 22 percent of observations (see Figure 1). Due to data limitations, results for different intervals may refer to different subsets in the data.

FIGURE 1

Number of Observations by Country, Fiscal Year, Procurement Category and Sector
The request for contract sample data sent to the survey countries was separated by key processing dates for Goods and Works (ICB, ICB with Pre-Qualification; NCB, NCB with Pre-Qualification), Goods and Works (ICB/NCB Two-Stage) and large value Consultant Services (QCBS, QBS, FBS, LCS, CQS, SSS). The respective dates for each procurement step were then merged across ICB/NCB, ICB/NCB Two-Stage and Consultant Services allowing for a global data set as well as preliminary subset analysis. Due to a low response rate for information on contracts involving ICB/NCB Two-Stage and Pre-Qualification (Evaluation Reports), data provided for these groups was integrated with the overall ICB/NCB data. For all contracts the dates for Final Bid Evaluation Reports were used when constructing time intervals. Contract values were converted to USD using monthly average exchange rates. The fiscal year of the contract was determined based on the date of the Bank’s No-Objection to the Bid Evaluation Report. Data were clustered by country, sector, procurement category and method. Country groupings focused on identifying the poorest countries in the data set, eligible for concessional IDA lending, and those eligible for IBRD loans available to middle-income and credit-worthy poor countries.\(^4\)

Analysis of Procurement Efficiency

To explore the time taken to process a contract, the analysis focused mainly on two overall elapsed times: (1) Borrower issue of Specific Procurement Notice, to Contract Signature, and (2) First Submission

Source: IEG analysis of Sample of Contract Data.
to the Bank of Draft Bid Documents, to Bank’s No-Objection to the Bid Evaluation Report. Two further intermediate steps in the procurement process are selectively reviewed to the extent that data permits: (3) First Submission to the Bank of Draft Bid Documents to Bank’s final No-Objection to the Draft Bid Documents; and (4) Borrower Submission to the Bank of Bid Evaluation Report to the Bank’s No-Objection to the Bid Evaluation Report.

**Select Findings: Average Elapsed Times**

Measured from the time when the borrower first submits draft bidding document to the Bank, results show that, looking at all contracts together, it takes on average 286 days until a prior reviewed contract is signed (Table 2). Separating contracts by category, Civil Works take the longest (307 days), though there are similar overall processing times for Goods (287 days) and Consultant Services (290 days). However the variable displayed a high dispersion from the average with a standard deviation of 160. While 50 percent of the contracts included in this analysis go from the submission of bid documents to the No-Objection to the bid evaluation report in less than 208 days, there are contracts with significant longer duration, for two contracts even more than 900 days, driving up average processing times.

**TABLE 2**

**Average Elapsed Time between Steps in the Procurement Process All Contracts (Days)**

<table>
<thead>
<tr>
<th>PROCUREMENT PROCESS STEPS</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Borrower Submission to Bank of Draft Bid (Pre)</td>
<td>171.9</td>
<td>56.6</td>
<td>24.6</td>
</tr>
<tr>
<td>(2) Bank final No-Objection to Draft Bid (Pre) Documents</td>
<td>169.0</td>
<td>66.0</td>
<td>77.7</td>
</tr>
<tr>
<td>(3) Borrower Issue of Bid (Pre) Documents</td>
<td>135.1</td>
<td>121.8</td>
<td>178.3</td>
</tr>
<tr>
<td>(4) Borrower Bid (Pre) opening date/Minutes</td>
<td>126.7</td>
<td>224.3</td>
<td>199.8</td>
</tr>
<tr>
<td>(5) Borrower Submission to Bank of Bid Evaluation Report</td>
<td>226.4</td>
<td>252.9</td>
<td>231.8</td>
</tr>
<tr>
<td>(6) Bank No-Objection to Bid Evaluation Report Date</td>
<td>253.0</td>
<td>286.1</td>
<td>269.5</td>
</tr>
<tr>
<td>(7) Date of Contract Signature</td>
<td>269.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(4) | 59.7 | 170.6 | 190.4 | 223.3
(5) | 118.4 | 144.9 | 178.0
(6) | 37.4 | 73.7
(7) | 48.2

Notes:
(1) = Issue of Specific Procurement Notice
(2) = Borrower first Submission to Bank of draft Bid (preQ) Documents
(3) = Bank final No Objection to draft Bid (PreQ) Documents
(4) = Borrower issue of Bid (PreQ) Documents
(5) = Borrower Bid (PreQ) Opening date/ Minutes
(6) = Borrower Submission to Bank of Bid Evaluation Report
(7) = Bank No-Objection to Bid Evaluation Report

Source: IEG analysis of a sample of contract data

Looking at critical shorter intervals, on average, the Bank’s No Objection to the Bidding Documents is issued 56 days after the Borrower submits a first draft, considerably longer than what Bank procedures recommend as a business standard for reviewing or providing comments to bidding documents. Documents presented for review may be returned for revision several times, which affects duration. While more than 45 percent of the contracts reviewed underwent just a single iteration of draft Bidding Documents review, another 44 percent of contracts required two or more rounds of review and some (less than 10 percent in the sample) required three, four or five iterations.

More than a quarter of the processing time from submission of bid documents until contract award is due to the preparation of the Bid Evaluation Report after Bid Opening. In the case of Consultant Services more than forty percent of processing time is dedicated to this step in the procurement process, likely due to the fact that for the QCBS procurement method two documents need to be prepared by the borrower; an evaluation of technical proposals and, after subsequent opening of financial proposals, a Combined Evaluation Report. Both reports require a No-Objection by the Bank. This remains true even after excluding the contracts that bring in the highest five percent of elapsed times per category.
TABLE 3
Average Elapsed Time and Contract Value by Procurement Category (Days, USD)

<table>
<thead>
<tr>
<th>Procurement Category</th>
<th>Number of Contracts (1)</th>
<th>Average Elapsed Time (days)(2)</th>
<th>Average Contract Value (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Works</td>
<td>137</td>
<td>307.2</td>
<td>15,000,000</td>
</tr>
<tr>
<td>Goods</td>
<td>124</td>
<td>287.8</td>
<td>4,709,600</td>
</tr>
<tr>
<td>Cons. Serv. (QCBS)</td>
<td>99</td>
<td>290.5</td>
<td>2,804,025</td>
</tr>
</tbody>
</table>

Notes:
(1) Number of Contracts in dataset (where Contract Value is available) (Nos);
(2) Average Elapsed Time from Borrower first submission to Bank of draft bid (preQ) documents to Contract Signature (days)

Source: IEG analysis of a sample of contract data

The analysis of relative performance of IBRD and IDA countries shows that average processing times are longer for contracts in IDA countries, and most of the difference in processing time stems from the very long time taken to procure Consultant Services (Figure 2). Together these results highlight that some procurement methods, notably for consultants, are more prone to delays, and that country capacity factors are likely a contributing factor.

FIGURE 2
IBRD and IDA Countries – Elapsed Procurement Times by Procurement Method (days)
Note: The time interval measured is from the Borrower’s first submission to the Bank of draft bid (pre-Qualification) documents to Contract Signature.

Source: IEG analysis of a sample of contract data.

Analysis and Findings: Variation in elapsed Times – Frequency Distributions

Average elapsed times do not tell a complete story; the degree of variation around the average describes the proportion of contracts that may take longer to process. For example, although on average 253 days were needed from the Borrower’s first Submission of draft Bidding Documents to the Bank’s final No Objection to the final Bid Evaluation Report of the contract, this variable displayed a high dispersion from the average. Half the contracts completed this process in less than 208 days, but contracts at the 75th percentile of the distribution took 331 days and contracts at the 95th percentile took 611 days (Table 4). The five largest processing times in this sample took from 690 to 941 days to process.

Comparing the arithmetic mean and the mode of the distributions, the former is typically higher, due to a proportion of contracts that are more time consuming. A key finding is that from the time the borrower issues the Specific Procurement Notice to signature of contract, the procurement process takes more time, on average, for the QCBS method used for the selection of consultant services, as compared to ICB and NCB. On average, the processing time to procure consultant services are more than 100 percent greater than for contracts awarded using NCB. Differences are not merely that of average time taken, but also in number of outliers (Figure 3).
TABLE 4
Summary Statistics for Variable Submission of Draft Bid Documents to Bank’s No-Objection to Final Bid Evaluation Report

<table>
<thead>
<tr>
<th>Percentiles</th>
<th>Smallest</th>
<th>Largest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Obs 249</td>
</tr>
<tr>
<td>1%</td>
<td>48</td>
<td>690</td>
</tr>
<tr>
<td>5%</td>
<td>80</td>
<td>832</td>
</tr>
<tr>
<td>10%</td>
<td>109</td>
<td>932</td>
</tr>
<tr>
<td>25%</td>
<td>147</td>
<td>941</td>
</tr>
<tr>
<td>50%</td>
<td>208</td>
<td></td>
</tr>
</tbody>
</table>

Source: IEG analysis of a sample of contract data

The distribution of elapsed times for the intermediate procurement step from submission of draft bid documents to the bank’s no-objection to the final bid evaluation report shows the existence of extreme values for all procurement methods, with especially high values for ICB and QCBS contracts. Consultant services and ICB contracts differ only by a few days in average processing time taken for this interval. The contracts that contribute the upper five percent of processing time for consultant services selected through QCBS take more than three times longer than the bottom fifty percent of contracts.
FIGURE 2
Distribution of Days from Issue of Specific Procurement Notice to Contract Signature

All Contracts

QCBS
Source: IEG analysis of a sample of contract data

**What Explains the Time Taken to Process a Contract?**

*Findings from Statistical Analysis*

Many factors can affect procurement process times and it is difficult to know what the most important determinants of elapsed time may be. A multiple regression helps understanding the relative influence of different factors that affect procurement processing time, including contract attributes, (procurement method, category of good or service procured, major sector, and contract value), together with country
specific control variables (governance indicators as proxied by the Bank's CPIA, levels of GDP and the poverty rate).

The distribution of residuals in the regressions exhibits deviation from the normal distribution, possibly due to some high leverage data points in the 'long tail' discussed in previous sections. This clearly affects the interpretation of regression results, as the normality of residuals cannot be consistently assumed. This analysis therefore focused on the correlation relationships that emerged between analyzed variables using robust standard errors in the regressions presented. While the non-normality of residuals does not affect the consistency of the estimate it may affect its statistical significance. Suggestive correlations found need therefore be weighed against the fact that errors are not normally distributed.

Two time intervals were examined, in terms of the time taken from: (1) the Issue of the Specific Procurement Notice to Contract Signature; and (2) the Submission of Draft Bidding Documents to the Final no-Objection to the Bid Evaluation Report. One key relationship that emerged from both specifications is that processing time is clearly associated with increased contract value. Explanatory variables included contract attributes (contract value, procurement method, category of work, good or service procured and major sector); control variables included country specific variables (GDP, poverty rate).

Results indicate a statistically significant positive relationship between contract value and processing time, robust to the introduction of controls (Table 1). This may be explained by the fact that larger contract values require higher clearance thresholds as briefly discussed above. Field procurement officers have to request clearance from hub coordinators, regional procurement managers, etc. The significant correlation between contract value and elapsed times is present even while controlling for regions, sectors, country attributes and GDP. Other variables may also be important, and data limitations may prevent statistically significant results. It is also true that contracts procured using National Competitive Bidding (NCB) appear to take less time than those using ICB, and finally, governance considerations in the countries concerned may make a statistically significant difference to processing time.

The first interval analyzed was the time taken from the Issue of the Specific Procurement Notice to Contract Signature. Explanatory variables included contract attributes: (contract value, procurement method, category of good or service being procured and major
sector); control variables included country specific variables (GDP, poverty rate). Results indicate a statistically significant positive relationship between contract value and processing time, robust to
the introduction of controls (Appendix Table 1). Coefficients denote
marginal effects, and results suggest (Appendix Table 1) that for
every $10m increase in contract value, the number of days for
processing increases by 14.6 days, independent of all other contract
attributes and across all countries and regional offices. Results also
indicate significantly lower elapsed times for NCB contracts compared
to ICB.

For a second interval from Submission of Draft Bid Documents to No-Objection to the Bid Evaluation Report data on this time interval was
available for 213 contracts. The positive relationship between
contract value and elapsed time remained statistically significant,
and robust to the addition of controls (Appendix Table 2). Marginal
effects were broadly similar - the regression coefficient implies that
for every $10m increase in contract value, the number of days for
Bank No Objection increases by 10.6 days, independent of all other contract attributes and across all countries and regional offices. The
coefficient for method - National Competitive Bidding - as compared
to other methods, was also significant, and the coefficient implies
that it takes the World Bank, on average, 65 days less to issue no objection for NCB method contracts as compared to ICB.

The second specification also adds country governance as a control
variable, in the form of the CPIA. Results indicate that country level
governance factors have a powerful influence on elapsed time, with
lower elapsed times for countries with higher CPIA scores.

Although only illustrative, the preceding analysis suggests a number
of factors that may impact process efficiency, and may at least pave
the way for more comprehensive and systematic work in this area.
First, average time taken is clearly much longer than Bank norms, but
second, there is a high level of variability in processing times, typically
with a 'long tail' of contracts that take considerably longer than
average times. Third, in terms of procurement methods, national
competitive bidding is notably quicker than ICB, and conversely,
consultant contract processing through quality and cost based
methods is particularly time consuming. Fourth, the size of a contract
in terms of its value is perhaps the single most important determinant
of elapsed time. This is likely explained by the implied clearance
thresholds and at least partially reflecting greater complexity of the
contract. And finally, country capacity and governance matter. Countries with lower CPIAs, or IDA countries compared to IBRD countries, appear to require longer processing times.

There are caveats to the interpretation of these results. First, the analysis here breaks down elapsed time by process step, but does not separate the time taken by World Bank procurement staff, other World Bank staff, and country officials. Therefore it is not possible to identify which set of players in the procurement process was responsible for any excesses in time taken. Data collected in this exercise did not permit the identification of elapsed time per iteration. Such data are available for the Africa region in the PROCYS database described above, but not on a global basis.  

Another caveat in interpretation is that longer times in some procurement processing clearly could reflect potentially justifiable delays due to significant problems encountered in the procurement execution process for individual contracts. The preceding analysis does not permit the separation of total elapsed time into justifiable delays and overruns that may be due to more mundane reasons.

CONCLUSION: GENERALIZABILITY TO OTHER PUBLIC PROCUREMENT CONTEXTS

To what extent are these methods of analysis generalizable to other contexts of public procurement? First, public procurement at most multilateral development banks and some other international financial institutions has to deal with issues of compliance and review in recipient countries. Given that procurement inefficiency reduces Value for Money, entities involved in international public procurement need to take steps to measure and analyze the source of the inefficiency. Measuring and analyzing procurement inefficiency, as highlighted in our analysis, requires data to be collected on dates of each step of procurement process. This data permits an analysis of not only average elapsed time for each step of the process, but also the distribution of time taken as this can reveal interesting information in addition to the average. Studying the drivers of procurement efficiency also requires contract and country attribute data, which, data permitting, can be used to conduct statistical regression analysis to highlight the relative importance of different potential sources of procurement inefficiency.

Beyond international agencies, to the extent that any public procurement process requires several ‘no objections’ it can
potentially introduce inefficiency in the time elapsed for each step. The present analysis is therefore also relevant for any procurement process that requires several steps of review and clearance. The analysis shows that there is scope for increasing efficiency by streamlining the review process, which could produce time savings and hence, potential cost savings, and therefore, that a process of tracking and monitoring such steps could help maintain discipline towards the achievement of value for money.

Other efficiency increasing (and transaction cost reducing) measures could also expand value for money. In the World Bank context, greater scope for integrated data management, and better availability and transparency of data emerged as relevant examples. Further steps could be taken to address efficiency aspects, such as the identification of an inventory of standardized procurement outcomes to use as benchmarks for process efficiency analysis, or risk and complexity adjusted measures that try to quantify the trade-off between performance and compliance.

Overall improvements in the collection of contract data can meet wider objectives. Used effectively, tracking and monitoring systems could collect information not only on the contract process but also on the prices paid, time taken, and whether value for money is achieved in public procurement. Multilateral Development Banks and other large public sector organizations are in a unique position to collect contract data on transactions and prices, which, if shared, could provide a wealth of data to administrations and development agencies. The pooled data can then be utilized for benchmarking purposes to eventually improve procurement efficiency, for example, benchmarking against internal best practices; against best practice in other similar organizations, or among specific supplier pools in a country/region, and finally, benchmarking using different procurement methodologies and criteria.
NOTES

1 As of March 2014. Proposals for revisions in the World Bank’s procurement framework are currently under consideration.

2 Most countries also set monetary thresholds for the use of shopping procurement method.

3 These systems are under review at the World Bank and improvements in system architecture are expected.

4 The International Development Association (IDA) is the part of the World Bank and one of the largest sources of assistance for the world’s 82 poorest countries, 40 of which are in Africa. IDA lends money on concessional terms. IDA also provides grants to countries at risk of debt distress.

5 For the regression analysis of average processing times from Submission of draft Bid Documents to No Objection to final Bid Evaluation Report only QCBS procurement is considered for Consultant Services contracts.

6 The complete report of the Independent Evaluation Group’s evaluation of the World Bank’s procurement systems and practices (IEG 2014) includes an analysis of the Africa regional data.
REFERENCES


### APPENDIX

#### TABLE 1

Analysis of Processing Time from Issuing of Notice to Contract Signature (N = 272)

<table>
<thead>
<tr>
<th>Variables</th>
<th>SPN to Contract Signature</th>
<th>Variables</th>
<th>SPN to Contract Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract</td>
<td>1.46e-06***</td>
<td>Contracts</td>
<td>(63.01)</td>
</tr>
<tr>
<td>Value</td>
<td>(1.01e-07)</td>
<td>NCB Method</td>
<td>-113.5***</td>
</tr>
<tr>
<td>Social Sector</td>
<td>-27.32</td>
<td>Cons. Method</td>
<td>93.17</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>64.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sector</td>
<td>(52.47)</td>
<td>GDP</td>
<td>0.0121*</td>
</tr>
<tr>
<td>Economic</td>
<td>-49.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sector</td>
<td>(47.34)</td>
<td>Average</td>
<td>-0.725</td>
</tr>
<tr>
<td>Civil Works</td>
<td>48.90</td>
<td>Poverty Rate</td>
<td>(4.488)</td>
</tr>
<tr>
<td>Contracts</td>
<td>(66.33)</td>
<td>Constant</td>
<td>158.0*</td>
</tr>
<tr>
<td>Consultant</td>
<td>70.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contracts</td>
<td>(75.10)</td>
<td>Observations</td>
<td>272</td>
</tr>
<tr>
<td>Goods</td>
<td>34.09</td>
<td>R-squared</td>
<td>0.346</td>
</tr>
</tbody>
</table>

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All Country and Regional Controls Have Been Included. The regression specifications were tested for multicollinearity using the "variance inflation factor" method, and all variables had a VIF score significantly less than 10, suggesting that multicollinearity is not a concern with the specification. Source: IEG analysis of sample contract data
**TABLE 2**

Analysis of Processing Time from Submission of draft Bid Documents to Bank’s No Objection to Final Bid Evaluation Report (N=213)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Processing Time for Bank No Objection</th>
<th>Variables</th>
<th>Processing Time for Bank No Objection</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCB Method</td>
<td>-64.61*</td>
<td>Contracts</td>
<td>(35.93)</td>
</tr>
<tr>
<td></td>
<td>(27.69)</td>
<td>Goods</td>
<td>-76.20*</td>
</tr>
<tr>
<td>QCBS</td>
<td>21.90</td>
<td>Contracts</td>
<td>(40.35)</td>
</tr>
<tr>
<td>Method</td>
<td>(34.87)</td>
<td>GDP Level</td>
<td>0.0352***</td>
</tr>
<tr>
<td>Contract</td>
<td>1.06e-06***</td>
<td>(0.00962)</td>
<td></td>
</tr>
<tr>
<td>Value</td>
<td>(1.78e-07)</td>
<td>Average</td>
<td>-1.816</td>
</tr>
<tr>
<td>Social Sector</td>
<td>-36.42</td>
<td>Poverty Rate</td>
<td>(2.819)</td>
</tr>
<tr>
<td></td>
<td>(41.27)</td>
<td>CPIA</td>
<td>-335.33***</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>-21.86</td>
<td>score</td>
<td>(112.82)</td>
</tr>
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<td>Sector</td>
<td>(35.25)</td>
<td>Constant</td>
<td>1,533***</td>
</tr>
<tr>
<td>Economic</td>
<td>-58.11</td>
<td>(410.6)</td>
<td></td>
</tr>
<tr>
<td>Sector</td>
<td>(44.20)</td>
<td>Observations</td>
<td>213</td>
</tr>
<tr>
<td>Civil Works</td>
<td>-51.14</td>
<td>R-squared</td>
<td>0.445</td>
</tr>
</tbody>
</table>

Notes: Specification includes country and regional level controls. The regression specifications were tested for multicollinearity using the “variance inflation factor” method, and all variables had a VIF score significantly less than 10, suggesting that multicollinearity is not a concern with the specification.

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Source: IEG analysis of sample contract data.
paper for the international public procurement conference

Trust Funds for Security. Helping the Afghan National Security Forces to be self sustainable?

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Disclaimer: the views expressed in this abstract are those of the author and do not necessarily represent and should not be attributed to any state and to any institution affiliated with the author

Introductory Remarks

In recent years, the number of intrastate conflicts around the world has been on a constant incline. The international aid, dedicated to strengthening state institutions in a countries with ongoing conflict and in post-conflict scenario, continues to grow. The focus of international efforts is on establishing state capacity to provide basic needs to society, economic growth, creating legitimacy and assisting in stabilizing the security situation. There are ‘donors’: supporting countries and organizations, and a ‘beneficiary’: a weak state often post-conflict or/and conflict affected, which requires international aid to sustain its new rebuilt structures. Effects of the assistance may be judged by self-sustainability and efficiency of institutions and processes established (or their lack) over a long period of time much exceeding a decade.

There is a link between security and development. Countries with strong economic growth are less likely to experience civil war. To stabilize and generate equitable growth they have to deal with development and security issues simultaneously, though it is not commonly agreed what comes first: whether it is security that determines development or the other way around. Both elements are required for a country to strengthen its institutions. Yet, strong institutions are required for the state to fulfill its functions, which include providing basic needs, economic growth and security for its people. The two way nexus of security – development - institutions can be thus established: institutions become stronger while development and security are gradually gained. Achieving security and development requires strong and capable institutions. Such situation calls from the start of the launching of state building agenda for the involvement of external actors – who are important in the first moments of the process both as financial and technical back-up or a motor of reforms undertaken. How, to what extend and where they get involved impacts the achievements of the efforts. This results in so called ‘shared sovereignty’ situation describing arrangements under which individuals chosen by international organizations, powerful states, or ad hoc entities share authority with nationals over some aspects of domestic sovereignty. The open question is how should they remain involved. Building security, achieving development and developing institutions becomes a common goal both for donors and for a beneficiary. Size of support given from outside depends on inter alia political interests of donors resulting in creation ‘aid darlings’ and ‘aid orphans’.

Since the fall of Taliban regime in 2001 the size of international assistance of various forms provided to Afghanistan has inclined making it an ‘aid darling’ at the same time - opposing the rule of international ‘light footprint’ presence (where the light footprint engagement means leaving no permanent marks of involvement in domestic affairs). The rule recommends not to build parallel institutions and double systems, which undermine local authority, weaken coordination as well as force creation of competition in aid delivering and programming of assistance. Multiplicity of reporting mechanisms and public procurement rules overwhelm national administration and pulls away attention from the state-building as a key goal. Despite enormous concentration of international efforts worth billions of usd making it an ‘aid darling’, Afghanistan is defined as weak, landlocked, developing state that is a ‘fragile situation’ (World Bank), a ‘post-conflict’ (IDA) and/or ‘developing economy with ongoing insurgency’ (UN), at a ‘failing’ and a ‘failed’ stadium (Fund for Peace) – what may lead to indication that there is
not much of sustainability of solutions adopted so far and not much of self-reliance on its own resource for Afghanistan to continue to function.

At least eleven public institutions and academic centers around the world (eight in the USA) have elaborated indexes of weak, fragile, developing, failing, failed, conflict, post-conflict states with the aim to enhance academic analysis and implementation of development policies. Among them the most known are indexes of beneficiaries of ODA according to OECD- DAC, Fragile and Conflict Affected Countries Group of World Bank, State Weakness Index of Brookings Institution, index of Failed States Fund for Peace, Governance and Social Development Resource Centre, State Fragility Index Centre for Systematic Peace, Middle Income but failed or fragile states Index of The Economist, as well as analytical proposal drafted by state development agencies: Index of fragile states by the British Department for International Development (DFID), fragility index of the US Agency for International Development (USAID) and Canadian International Development Agency (CIDA) Index. Aside those already mentioned there is UNDP Human Development Index, Transparency International: Corruption Index, World Bank index doing business as well as Low Income Countries under stress, classifying states according to conflict situation, then Uppsala University, which present database on conflicts around the world as well as Institute for State Effectiveness, classifying states according to fulfillment of functions. Such multiplicity leads to conclusion that it is easier to agree, which states are developed and strong, than to classify them according to level of their development. Describing a state as developed does not mean that it does not continue to develop and that is strong. It depends upon criteria and definition taken as foundations of analysis. It is important to state, that certain weak states may appear to be strong according to other indexes, as they effectively executing their monopoly on the use of force and have strong security apparatus. This leads to a lack of clarity of definitions used, which often repeat themselves in various indexes and collectively do not include all types of states. Sometimes new index applies data coming from other indexes creating new set of information. Literature available on the issue presents rather various perspectives and characteristics of states than a clear typology or method of clearly defined categorization of states. Afghanistan is caught in this definition trap. While it is easier to ‘tag’ Afghanistan as a ‘weak’, ‘fragile’, ‘developing’, ‘failing’ and ‘failed’ state, the problem starts with analysis of presence and absence of conflict on its territory thus making it post-conflict and/or conflict situation. The issue is especially important as it defines size and forms of international assistance and impacts role of elements of security apparatus such as army and police in the functioning of state.

Due to geopolitical, economic and social causes, Afghanistan belongs to a group of the least developed, landlocked countries in the world. Lack of sea access has a significant impact on its economic development. Due to ongoing insurgencies (warlords, Taliban and crime groups), it remains a conflict country that, because of i.e. in-flow of international assistance, is often classified as a post-conflict state with a strong international military assistance and presence. In recent years, assuring security, which permits development aid to reach the beneficiaries, has become a priority for actors concerned. As a consequence: strengthening Security Forces in Afghanistan - a factor influencing sustainability of peace in the country – became crucial for those involved in reconstruction. Form and size of assistance has been diverse, as methods to provide it. One of them, proposed by international actors, has been to establish Trust Funds for developing capacities of the ANSF.

The principal aim of this paper is to discuss the issue of Trust Funds for Afghan National Security Forces (ANSF) in Afghanistan as a tool for capacity development. The research is based on the following methodology: legal-dogmatic method (analysis of legal texts, primary source documentation), historic method as well as field research. The paper is structured in the following manner: First part focuses on terminology of conflict and post-conflict situations, which then is put into the Afghan context. Second part presents the Afghan National Security Forces explaining their types, roles and size. In the third part a specific attention is given to trust funds as a form of state building. First, the concept of state building is explained in order to appropriately place trust funds as a tool for sustainability of adopted solutions. There is also a presentation of existing trust funds for the ANSF included. The last part of the paper presents possible design of the trust funds for post-2014 Afghanistan with specific focus on ANA Trust Fund for the Afghan National Army.

The subject of research comes timely. Year 2014 may be crucial for Afghanistan. It is the year when withdrawal of international forces occurs and the Afghans take on responsibility for security of the entire state created according to the system established from 2001 onwards, following fall of Taliban government. As commitments so far indicate, the international actors may remain involved in developing security forces in Afghanistan in post-2014 period one way or another if legal basis for such presence will be agreed upon, but form and size of this assistance is not yet clear. The upcoming months and years will prove effectiveness of all the efforts of international actors taken so far and define their future engagement. Since year 2014 may bring changes in the Afghan context within days and weeks, the information provided in this paper shall be considered updated as of beginning of March 2014.
PART I
CONFLICT AND POST-CONFLICT SITUATIONS

There is no commonly agreed legal definition of ‘conflict’, but there are two principal academic centers that provide definition for political analysis. According to Heidelberger Institut für Internationale Konfliktforschung (HIIK) political conflict means difference in position (conflict of interest) relating to national values which are important in a given time. It includes two sides (organized groups, countries, group of countries, organizations) determined to defend their interests and achieve their aims. In this definition conflict may also be intrastate, where one of the countries is not a state. Such a situation may also be defined as an asymmetric, when the capacities of two sides differ significantly. The qualitative criteria, such as activities undertaken by the sides constitute a basis of differentiation of conflict states (hidden, open conflict, crisis, heavy crisis, war etc.). According to Uppsala Conflict Data Programme (UCDP), armed conflict is a ‘contested incompatibility’, which relates to government or territory, during which there is an application of armed force between two sides, out of which at least one is a state government and as a consequence of conflict there is a death of at least 25 persons in a calendar year occurring.

Depending on an actor involved and number of deaths, UCDP differentiates: interstate, intrastate, intrastate with foreign involved and non-state conflict, small, middle and large conflict.

A ‘post-conflict state’ is a country in which an open clash between adversaries has ended, but tensions may appear in a long term and may escalate to a large scale situation. Another way of defining ‘post-conflict state’ in which sources of conflict are eliminated is to distinguish it from a ‘war-state’, where war activities continue. World Bank, UN, OECD do not differentiate ‘conflict affected’ from ‘fragile’ states presenting those group together based on assumption that ‘conflict’ or ‘conflict affected’ countries have fragile state structures, which are unable to provide internal security. In a ‘post-conflict state’ a reconstruction occurs in a situation where a conflict has been put down to some extent, but it continues in some parts of the territory. In other words: in a ‘post-conflict state’ there is absence of war and no peace achieved. Defining a given state as a post-conflict or conflict state depends on an interpretation of conflict according to various ways of its definition. It is thus possible that on a given territory there are number of conflict-like situations. A state may defined as a ‘conflict’ and a ‘post-conflict’ situation, when an interstate conflict ends, although intrastate conflict, which involves state structures continues. Afghanistan is an example of it.

AFGHAN CONTEXT

Afghanistan as a conflict state: Since 1946 Afghanistan has experienced intrastate, interstate conflict and armed activities to which the state has not been party. According to UCDP and HIJK Afghanistan is at war, if one considers number of fights related deaths exceeding 1000 a year. There are multiple sources of conflict in Afghanistan such as system, ideology, power, natural resources, approach to reconciliation and reintegration, fight against terrorism, security sector reform, drug trade and withdrawal of International forces. There are multiple sides: a state represented by the government of Hamid Karzaj, which in itself is not unitary, Taliban, Al Quaida, Haqqani Network, Hezb-e-Islami Gulbuddin, organized crime groups, warlords, local commanders and drug dealers to mention few. Conflict in Afghanistan has a number of layers and may be analyzed from internal, regional and international perspective. Depending on subject, cause and participants Afghanistan has experienced conflict for around 30 years.

Situation in Afghanistan is an intrastate non-conventional war, an insurgency based on guerilla, which simultaneously remains a political movement and a political campaign. Military campaign of the International Security Assistance Forces (ISAF) has been faced with military opposition of insurgency character making it very asymmetric. The support given to insurgents may be passive (providing shelter) and active (participating in military activities). Conflict in Afghanistan can be defined as a non-conventional war because there has not been any agreement between the side on rules of procedure which should be followed during the war. The insurgency uses all possible means (financial, logistical, human and material) to achieve its goal that is withdrawal of international forces from Afghanistan, while ISAF uses only some. In this case the insurgency action remains a continuation of politics not just by other, but by all available resources. The principal insurgency strategy aims to prevent open, direct confrontation by replacing it with a permanent pressure on ISAF coalition forces and a feeling of threat. As there is no line between political and military resources – the response may not only be just political or just military. The Counter-Insurgency doctrine (COIN) together with “winning hearts and minds” campaign became an answer of US and coalition forces to the Afghan conflict.

Afghanistan is inhabited by a numerous ethnic and linguistic groups, largest (except Hazaras) living next at the state borders (Pashtuns, Tajiks, Uzbeks, Turks, Kirgiz, Baluchis). The common characteristic for all is Islam and...
fact that they are all Muslim. Social and cultural hierarchy is more important than ethnic hierarchy, but ethnicity plays important role especially in assignment of various ministries to different ethnic groups.

**Afghanistan as a conflict affected state:** Afghanistan has always been a subject to ‘the Great Game’ for influences in the region. Thus by definition it is a battlefield. It is a part of complex conflict of regional character. It means that the events beyond its borders have had impact on its internal situation. Its neighbors are: Iran, Pakistan, Tajikistan, Uzbekistan, Turkmenistan as well as China. Three of those countries (Iran, Pakistan and China) are also a nuclear powers. Aside those mentioned, as well as ISAF members there is a number of countries interested in Afghanistan such as Russia, India, United Arab Emirates and Saudi Arabia. Each of them has its own interest, which it translates into approach to the Afghan internal affairs. A New Great Game is taking place among all those players, and regional politics play important role in shaping Afghan internal dynamics. None of the neighbors does participate in the ISAF coalition and does provide any military forces on the Afghan land.

**Afghanistan as a post-conflict state:** On September 11th, 2001 the towers of World Trade Center and part of Pentagon in the USA have been destroyed while killing over 5000 people in a terrorist attack. In response the USA informed the UN Security Council, that based on art. 51 of the UN Charter they apply right to self defense against camps of Al Qaeda terrorist group and against those elements of Talib an regime that support it in Afghanistan. The US enemy was not a state and the response was not a interstate conflict. As a legal basis USA applied UN Security Council 1368(2001) of September 12th, 2001 and UN Security Council Resolution 1373(2001) September 28th, 2001, which condemned the terrorist attack and referred to art. Article 51 of UN Charter on the right to self-defence. On September 20th 2001, US president George W. Bush declared War on Terror, which has become a defining principle of US engagement in Afghanistan. On October 2nd 2001, lord Robertson, NATO Secretary General confirmed that the attack against the USA originated from outside and thus should be considered as action described within art. 5 of Washington Treaty, which stipulates that an armed attack against one or more of the NATO members in Europe or North America shall be considered an attack against them all. The same interpretation of the events was adopted by the Organization of American States, which referred to article 2 of OAS Charter including common defence in case of aggression. On October 7th 2001, in response to Taliban refuse to hand over Osama Bin Laden, US commenced Operation Enduring Freedom to which other states joined. December 7th 2001 last city of Taliban: Kandahar has failed and on December 20th 2001 UN Security Council authorized creation of International Security Assistance Force (ISAF) to assist Afghan Interim Authority in stabilizing the country and in training of the Afghani National Security Forces (ANSF). Following establishment of the ISAF the interstate conflict in Afghanistan ended and Afghanistan could be considered as a post-conflict state. As the years went by Afghanistan remained in a post-conflict insecurity.

**PART II 
AFGHAN NATIONAL SECURITY FORCES (ANSF)**

According to the Afghan National Budget of 1393 (March 2014 - March 2015) security sector includes resources for Ministry of Interior, General Directorate of National Security, President Protective Services and Security Council, Ministry of Foreign Affairs and Ministry of National Defence. The Bonn Agreement in 2001 initiated Afghanistan’s post-conflict state-building process as soon as the Taliban were overthrown. The Bonn Agreement however did not include any specific provisions on the ANSF except for requesting in its annex I the assistance of the international community in helping the new Afghan authorities in the establishment and training of new Afghan security and armed forces. Conscious that some time may be required for the new Afghan security and armed forces to be fully constituted and functioning, the participants in the UN Talks on Afghanistan requested the UN Security Council to consider authorizing the early deployment to Afghanistan of a UN mandated force. This force was to assist in the maintenance of security for Kabul and its surrounding areas. Such a force could, as appropriate, be progressively expanded to other urban centers and other areas.

In April 2002 during a G8 (Group of Eight) conference in Geneva it was agreed to share responsibility for reform of the Afghan security sector among international actors engaged in Afghanistan in accordance with “pillar approach” where a committed countries where taking on responsibilities as ‘Lead Nation’. USA took on responsibility for training and strengthening Afghan National Army, Germany – Afghan National Police, Italy – development of justice sector, United Nations counter-narcotics, Japan: demobilization, disarmament and reintegration. In this area UN has narrowed its participation to monitoring of security situation and providing support for agenda of the ANSF building. The ‘Lead Nation’ method was gradually put aside with 2006 Afghanistan Compact which established i.e. International Police Coordination Board (IPC) responsible for coordination, leading and prioritizing of activities for establishing effective Afghan National Police (with exception to the Afghan National Army, where US, as a major financial contributor continued to play the most important role). In next several years there was increased international involvement in building the effective the ANSF. In August 2008 lead security responsibility for Kabul city was transferred to the ANSF, which marked
gradual transfer of responsibility for security (dari: INTEQUAL — ang. transition) to the ANSF. In November 2009 President Hamid Karzai having won a second presidential term expressed his ambition to see the ANSF taking the lead security responsibility across Afghanistan by the end of 2014. In November 2009 a NATO Training Mission in Afghanistan (NTM-A) was established. The mission aimed to train and mentor the ANSF in close cooperation with the ISAF Joint Command (JIC) and Afghan Ministry of Defence and the Ministry of Interior. In July 2010, during Kabul Conference, the Joint Afghan-NATO INTEQUAL Board (JANIB) was established as the mechanism to assess districts and provinces for transition. At the NATO Summit in Lisbon in 2010 the participants approved the INTEQUAL process and agreed to the target year of 2014 when Afghanistan was to take a full responsibility of national security. The INTEQUAL has been taking place in the five tranches. In March 2011 president Hamid Karzai announced the first set of the Afghan districts and provinces to start the transition process. The NATO Chicago Summit confirmed the INTEQUAL in May 2012. In 2013 all areas of the country have entered the transition process and the ANSF assumed security lead across the whole country, with ISAF operating in a supporting role, including with combat support when necessary. As part of the transition process, Provincial Reconstruction Teams (PRT), established in 2002 have also been evolving towards the ultimate dissolution of all teams by the end of 2014. Many PRT has shifted their focus from direct delivery to enhancing the effectiveness of the Afghan national and provincial government structures. As underlined by the NATO, by the time transition is complete, all PRT will have handed over their functions to the Afghan government, and will have been phased out.

There is no legally binding document in Afghanistan, which would provide a definite list of elements of the Afghan National Security Forces. It makes those forces vulnerable to frequent structural modifications hard to follow by external observers. The ANSF may include: Afghan National Army (ANA), Afghan Air Force (AAF) and the Afghan National Police (ANP), along with the Afghan Local Police (ALP). In this group sometime the National Directorate of Security (NDS) — Afghan intelligence agency is included. The Afghan Public Protection Force (APPF), thou remains under control of Ministry of Interior, is a State Owned Enterprise (SOE) contracting with domestic and international customers for security services and for this reason it is treated separately from other police forces. Provided below numbers are based on the Tashkeel — administrative yearly plan, which is used as basis for establishing the MoD and MoI budgets. It is important to note, that Afghanistan experiences issue of ‘ghost-workers’, which relates to existence of employees only on the paper and not in reality. This artificially increases number of personnel assuring larger financial resources, but not necessary more staff having an impact on security situation across the country.

Afghan National Army (ANA): the force created in 2002 under leadership of Minister of Defence. It includes 187 000 personnel, of which nearly 11 000 special forces. It consists of military police, intelligence, route clearance, combat support, medical aviation and logistics. The ANA structure includes six corps located in different parts of the country, 1 division (consisting of two brigades) based in Kabul, and 24 additional brigades (including two Mobile Strike force brigades commanded from Kabul, and deployed as needed throughout the country. The ANA is approximately 96% compete with fielding forces with 11 specialty battalions remaining to be fielded. The NTM-A mission focuses on training, assisting and advising the ANA leadership in fielding and developing institutional capabilities such as logistics and education.

The Afghan Air Force (AAF) force created in 2007 as part of the ANA. It includes approximately 6800 personnel and 96 aircraft. This includes aircrew and maintenance as well as support personnel. It has a fleet of approx. 102 fixed-wing and rotary-wing aircraft. The Air Force is part of counter-insurgency efforts, which is to permit the Afghans to lead the operation from land and air independently. The target is to increase the number of AAF personnel to 8 000 and aircraft to 140 by 2016. The re-establishment of the AAF began later than that of the Army and Police and is expected to transition to autonomous operations by 2017.

Afghan National Police (ANP); it includes 152 600 personnel. So far its role has been more of paramilitary than a civilian character. The ANP includes: Afghan Uniformed Police (AUP) including the community police, traffic police and fire-fighters, Afghan Anti-Crime Police (ACP) including counter-narcotics, counter-terrorism and a criminal investigations department, Afghan National Civil Order Police (ANCOP), Afghan Border Police (ABP), falling under command of the Minister of Interior. The ANP includes also a General Directorate Police Special Unit (GDPSU), which compromises of three National Units with a mandate to operate across the entire country and 19 provincial units called Provincial Response Companies (PRCs). It conducts high risk arrests, cordon and searches, quick reaction force, armed reconnaissance, vehicle interdiction, reconnaissance patrol, cache recovery and security patrolling. The structure of ANP is confusing and subject to frequent modifications. Moreover, since the structure is not formalized in any legal binding document the formations are sometimes presented as separate cells within ANP or as part of the AUP, ANCOP or ABP. Even NATO on its website presents contradictory structure of the ANP. The AUP is the police force assigned to district, provinces and regions. ANCOP is the COIN force. It is nationally deployable police force that works closely with the ANA as part of its COIN.
mission and maintains the rule of law and order utilizing proportionate armed capabilities. ABP provides the MoI with a general law enforcement capability at international borders, entry points and in the Border Security Zone, which extends 50 km into the Afghan territory. In addition, the ABP controls pedestrian and vehicular traffic at border crossing points, deters and detects illegal entry and other criminal activity along the border and is responsible for airport security at five international airports.

Afghan Local Police (ALP) has been established in 2010 and is part of police force, thou often presented as a separate force. Its focus on village level activities and remains complementary to counterinsurgency efforts. It functions there, where local population requests its presence. These communities then select local defenders to serve as their ALP. The USA supports the ALP programme through the provision of funding, training, equipping and technical assistance to the Afghan Ministry of Interior. It includes approximately 24 200 personnel working in nearly 1/3 of all districts across Afghanistan.

Afghan Public Protection Force (APPF) The APPF is a pay-for-service Afghan government security service provider under the Ministry of Interior. Its aim is to protect people, infrastructure, facilities, construction projects and convoys. It is organized as a State Owned Enterprise (SOE) in order to be able to contract with domestic and international customers for security services. The APPF was established in 2009 and has about 10 000 guards who provide security for international, government and non-governmental entities, sites and facilities. As a result of Presidential Decree 62, the APPF’s role will grow substantially over the next year as it takes over security responsibility from private security companies. The APPF has received support from the NATO Training Mission-Afghanistan (NTM-A) since 2011. This support consists of mentorship on support to government and non-governmental organizations, convoy operations, international site transition as well as business management.

Despite enormous external financial and technical assistance provided to the ANSF, considering increasing level of insecurity the forces are perceived as lacking education and specialized skills, corrupted, incompetent and ineffective.

PART III
STATE BUILDING AND SECURITY SECTOR SUPPORT

As it has already been mentioned, differentiation between conflict affected or conflict state and post-conflict states is important for accessing to various forms of international assistance. From the development perspective in conflict affected and conflict-states the principal form of international engagement has a military character, because there is an ongoing conflict and the situation may require participation of both domestic and international military forces. Stabilizing security situation becomes thus a priority. Aside of military engagement, a humanitarian assistance plays a role of meeting basic social needs. All or most other forms of international assistance due to insecurity are either limited or inexistent. In post-conflict states engagement has military, humanitarian and civil character, and its size depends on security situation, which then allows the aid to be delivered across a country to those in need. Defining a state as a post-conflict means that a violent social conflict changes its form and intensity becoming a more friendly environment for an externally sponsored reconstruction and system reform. In a post-conflict state violence continues to be present in various forms and remains a challenge for designing policies within wider discourse of state building – where state capacity is at the central focus of all attention.

The role of weak and fragile state in development has undergone significant change in recent years. 30 years ago, in 80’s Washington consensus was a principal point of reference. According to this concept, role of state was to be limited to minimum, while market forces were free to regulate development. It was only in 90’s when ‘state-building’ began to re-emerge, as importance of concept of ‘good governance’ was discussed. A state became a driver of development. As a result, a concept of ‘state-building’ become a form of an answer of international actors to needs of newly created states, which in principle could be applied to any type of state – whether conflict or post-conflict, weak and fragile or developed. There is no commonly accepted definition of ‘state-building’ although it has become a principal discourse within global search for ways to develop states. OECD defines ‘state-building’ as endogenous process dependent upon internal actors, which aims at strengthening capacities and legitimacy of state based on relation between them and the society. In a post-conflict, conflict-affected and conflict countries, ‘state-building’ means triple transformation in interrelated fields: political, economic-social and security sector. Those three fields correspond to the principal functions of the state: recreating legitimacy, support to state capacity which may allow meeting basic needs and development of capacities to assure security internal and external of the state.

In the Afghanistan one of the largest problems is lack of security and ongoing insurgency. From the perspective of reconstructing state institutions efforts to fight insurgents become priority. This includes armed operations as well as disarmament, demobilization and where possible reintegration of opposition. Annually the Afghan budget for security sector remains the largest amounting to 44,1% of total national budget. The development of capacity to
secure the country implies also presence of international peace-building mission. Security is a condition which is necessary for stabilization and development towards return to normal political and economic activities of a state, and the international actors as well as Afghan know it. Building functional state requires basic level of security. Adequate status, capacity and activities of national security forces are another element of achieving state capacity to assure security of population. ANSF can contribute both to the failure of a state and further deepening of a conflict or its reconstruction. Corrupted, unaccountable security forces are the principal obstacle for state legitimacy. They prevent reestablishing of basic function and thus lead to further development of conflict. This is why, considering ongoing “War on Terror” (which aims i.e. at preventing creation of new terrorist hubs that may impact international security), the sustainment of sufficient and capable ANSF became one of the priorities of international engagement in Afghanistan.

TRUST FUNDS AS A FORM INTERNATIONAL ASSISTANCE

A military action cannot be successful over long term without involvement of civilian activities and tools aiming to reconstruct a state. In the new NATO Strategic Concept agreed in 2010, the Alliance committed itself to dealing with “all stages of a crisis – before, during and after” - an all-embracing principle that implies a greater role for cooperative security. This idea is at the heart of the NATO “comprehensive approach”, which states that geopolitical instability demands complex remedies that combine military might, diplomacy, and post-conflict stabilization. Only the widest possible coalition of international actors can provide elements of all three. Thus the military took on task to build state by their own means. “State-building” becomes a goal of international assistance, which may take up various forms. It may be provided in form of financial or material means as well as technical assistance that includes both technological instruments and human resources. The Government of Afghanistan does not have the resources to finance all national spending. The weak revenue base results from economic, political and administrative factors. Thus its sustainability is highly dependent on foreign financial resources.

Since the fall of Taliban in 2001 until 2009 international assistance, military and security means valued approximately US$286.4 billion have been concentrated in Afghanistan. It also hosts the world’s largest and most costly international peacekeeping force mandated by the United Nations. Foreign military operations in the country have cost in excess of US$242.9 billion. Volumes of funding in support of building the security sector and of counter-narcotics activities are extremely difficult to trace, but total to at least US$16.1 billion. The international aid to Afghanistan has been provided through on and off-budget channels, with a significant level of aid passed without involvement of the Afghan public administration. On-budget support includes bilateral and multilateral assistance, which has been planned by the Afghan government and was provided also through trust funds.

The idea of supporting state-building through use of trust funds for developing various sectors is not new and has been widely accepted and promoted as international best practice both by civilian and military international organizations and states for number of years. To support conduct of security sector reform, in 2009 NATO issued NATO Partnership for Peace (PfP) Trust Fund Policy, recognizing this tool as (inter alia) an effective instrument of assistance to manage the consequences of defence reform. Originally, NATO Trust Funds were developed in the framework of NATO’s PfP programme – NATO’s programme of practical bilateral cooperation with non-member countries in Europe, the South Caucasus and Central Asia. However, over the years, use of Trust Funds has been extended to countries of the Mediterranean and broader Middle East region, which participate in NATO’s Mediterranean Dialogue and the Istanbul Cooperation Initiative, as well as to Afghanistan. More recently, with the launch of NATO’s new partnership policy at the April 2011 meeting of NATO Foreign Ministers in Berlin, the Trust Fund mechanism was also opened to NATO’s other partners across the globe. The Trust Fund policy has been an integral part of NATO’s policy of developing practical security cooperation with partners. Any partner country having an individual programme of partnership and cooperation with NATO may request assistance. A specific Trust Fund is then established to allow individual NATO and partner countries to provide financial support on a voluntary basis.

OVERVIEW OF MULTILATERAL TRUST FUNDS

The Afghan government does not have the resources to finance all national security spending. Afghanistan has benefited from existence of a number of multilateral trust funds established for security sector reform and general reconstruction efforts. In the latter group the Afghanistan Reconstruction Trust Fund (ARTF) is a principal financial instrument. ARTF is the largest single multi-donor trust fund administered by the World Bank. It has emerged in 2002 to provide a coordinated financing mechanism for the Government of Afghanistan's budget and priority national investment projects. Supported by 33 donors, it is a financing instrument for key sectors including education, health, agriculture, rural development, infrastructure, and governance. In the audit report of 2012, the structure and functioning of the ARTF has been described as very good. The ARTF remains the mechanism of choice for on-budget funding, with low overhead/transaction costs, excellent transparency and high accountability.
and provides a well-functioning arena for policy debate and consensus creation. For procurement matters it uses as a basis the World Bank procurement procedures.

**The Law and Order Trust Fund (LOFTA):** LOFTA was established for the purpose in May 2002 with the following priorities in support of the Afghan National Police: Payment of police staff salaries nationwide, Acquisition of non-lethal equipment, Rehabilitation of department facilities, Recruitment and training, Institutional development. For procurement matters it uses as a basis the World Bank procurement procedures. By 2014, LOFTA has committed to train 5000 female police in the ANP.

**Afghan National Army (ANA) Trust Fund** – created in 2007, the NATO-ANA Trust Fund has been gradually expending over time and now supports the long-term sustainment of the ANA and the ANSF literacy and professional military education. Aside of this it supports: transportation and installation costs for equipment donations by ISAF nations to the ANA; purchase of ANA equipment and services for engineering projects; in-and out-of-country training. In March 2009, the scope of the ANA Trust Fund was expanded to support the long-term sustainment of the ANA. As of April 2013, national contributions and pledges made to the current NATO-ANA Trust Fund total almost 600 million euro.

**NATO – Russia Council (NRC) Helicopter Maintenance Trust Fund** – launched in March 2011 and managed by the NATO and Russia Council, the NRC Trust Fund provides maintenance and repair capacity, including the provision of spare parts and technician training to the Afghan Air Force Helicopter fleet. So far two phases of the project have been implemented.

**Afghanistan Peace and Reintegration Trust Fund (APRTF)** – launched in 2010 and managed jointly by Afghanistan and UNDP, as well as supported by the ISAF, with aim of supporting Afghanistan’s peace and reintegration efforts in the country. The APRP has been developed on the basis of the recommendations of the 1600 broadly representative Afghan delegates to the Consultative Peace Jirga (CPJ) of June 2010. As of today it is project will end in 2015. It is led by the Afghanistan and it seeks to provide a means for Anti-Government Elements (AGEs) to renounce violence, reintegrate and become a productive part of Afghan society.

**Counter Narcotics Trust Fund** – The UNDP has established a trust fund in 2005 to help the Government attract and manage funds in support of the Government’s National Drug Control Strategy. UNDP’s involvement is intended to provide the required transparency and accountability that would enable donors to contribute resources and to ensure greater coherence and coordination in the funding of counter narcotics programmes. The Counter Narcotics Trust Fund is nationally executed, although UNDP plays a very active role in the review and approval of all cash advances. It addresses all eight pillars of the National Drug Control Strategy as follows: Alternative livelihoods; Institution building; Public information and advocacy; Enforcement of drug laws; Strengthening of criminal justice.

**Post-Operations Emergency Relief Fund (POERF)** – NATO established POERF in 2006 to provide quick humanitarian assistance, such as the supply of food, water and shelter, or the repair of buildings or key infrastructure, immediately following sizable ISAF military operations. The Fund consists entirely of voluntary donations and is established under the auspices of the Commander of ISAF (COMISAF), who is responsible for its sound financial management. NATO’s North Atlantic Council, through the Senior Civilian Representative (SCR), is regularly updated on the implementation of the Fund.

### PART IV

**INTERNATIONAL ENGAGEMENT IN SECURITY SECTOR IN POST-2014 AFGHANISTAN**

As of today it is not clear whether all the above mentioned funds for the ANSF will continue to function in the post-2014 scenario. It may though be presumed due to its rather general and all encompassing nature that the ARTF will continue to function after 2014 subject to financial donations dictated by political will of the international actors. The issue here is financing of ANSF future. At the NATO Summit in Chicago in May 2012, NATO Allies and ISAF nations agreed that building upon existing mechanisms, they would play their part in developing appropriate, coherent and effective funding mechanisms and expenditures arrangements for all strands of the ANSF. So far the analysis or work has started on two Funds, namely LOTFA and ANA Trust Fund. The other have not been subject of broader international discussion. While no doubt trust funds provide benefits (i.e. financial resources) to the country concerned since they provide on-budget support they might also constitute impediments to its further development, as they require creation of parallel structures (project management cells), additional reporting mechanism and application of additional procurement rules.
The withdrawal of all ISAF from Afghanistan by the end of 2014 was decided at the International Conference on Afghanistan in Bonn in December 2011, where it was also stipulated that once the international forces were withdrawn, full responsibility for security policy would be handed to the ANSF. However the ANSF are not yet adequately equipped and trained to tend to security and stability throughout the country. The continued presence of Taliban groups that are capable of exercising force becomes a significant destabilising factor that influences fragile solutions adopted in Afghanistan. The post-2014 scenario of international engagement in Afghanistan continues to be drafted as the political situation in Afghanistan unfolds. At a conference in Tokyo on 8 July 2012, Afghanistan’s donors pledged US$16 billion in reconstruction aid over the next four years, though as the history of international aid show the size of pledges do not necessarily reflect the level of disbursements. The commitments of 2012 are tied. The Afghan government has committed itself to holding free and fair presidential and parliamentary elections in 2014 and 2015, to improving financial supervision and governance, and to more effectively fighting the rampant corruption. But the future of security sector in Afghanistan is very unclear.

At the NATO Summit in Chicago in May 2012, a number of financial commitments to supporting the ANSF has been made. The ‘strategic partnership’ agreement between the US and Afghanistan that was signed in May 2012. In July 2012, Afghanistan was declared a ‘major non-NATO ally’ of the USA—which should facilitate its access to weapons and military equipment. However it is still unclear how many ISAF troops—with which tasks—will remain in the country after 2014. It is also unclear the size and length of financial support to security apparatus created by the external actors. Despite that, the work on the development of appropriate, coherent and effective funding mechanisms and expenditure-arrangements is currently underway. In December 2013, NATO allies and ISAF nations agreed to the provisions of the adopted ANA Trust Fund post-2014. These provisions include:

a) The adopted ANA Trust Fund will continue to focus its activities on the Afghan National Army primarily, while retaining the existing flexibility to encompass other ANSF;
b) Funds will be allocated against the ANSF requirements plan (Tashkeel) to be yet developed;
c) The USA will manage the Fund until 2017;
d) The use of the fund will be based on yearly Implementation Plan, but in general in the post-2014 period, the ANA Trust Fund would be used in support of literacy training capacity building, women’s participation within the relevant Afghan Ministries and security institution;
e) There will be annual audit undertaken;
f) ANA Trust Fund Board will be constituted to monitor the ANA Trust Fund and to review its cost effectiveness, financial integrity and accountability.
g) The Board would be composed of national representatives of donor nations and the Trust Fund Manager.

The above provisions have been based on the assumptions that the Afghan authorities will develop requirements plan for the ANSF and their share in the ANSF sustainment will gradually increase from at least US$500 million in 2015 with the aim to their own sustainability by 2024. As the budget of 2012 shows, already now, the Afghan government provides nearly US$500 million (in the budgetary year 2012 – 2013) to support the ANSF, while the Afghan budget is highly dependent on external resources. Removing or lowering down provision of external financing of other sectors in the national budget may result - subject to numerous internal factors (such as security situation and new (old?) political establishment) - in decrease of the size of domestic funding for the ANA and ANP. Moreover considering that there is no commonly agreed definition of the ANSF, the future financial constraints may impact the structure and the size of the ANSF. While drafting the first rules of the new ANA Trust Fund, the NATO presumed that Afghans would gradually take on full financial responsibilities for the ANSF. Considering that the political scene is taking shape in highly unstable environment and the size and form of future international engagement continues to be unknown it is hard to predict if the ANSF self-sustainability can be ever achieved.

Precluding that LOTFA, bilateral funding and Afghan funding would continue to be subject to their own internal procedure and processes from the perspective of the Afghan administration means multiplicity of parallel institutions, reporting mechanisms and procurement rules resulting in number of challenges that the Afghan administration already faces.

CONCLUSIONS

- Trust funds are means of state building process. The state-building is an internally led long-term process, which requires a concept and capacity of the national leaders to take over the responsibilities of fulfilling basic state functions. Trust Funds for the ANSF are probably one of the few means to support the Afghan security apparatus, after the withdrawal of the international forces, though they might not necessarily contribute to achieving security in the country, which depends on internal dynamics of the Afghan conflict and political situation.
● Trust funds are example of outsourcing of a state capacity to deliver, when a state is unable to finance and fulfil its fundamental functions. While financing the ANSF may contribute to the sustainability of the Afghan state in a short term, it will not positively impact its self-sustainability making it even more aid dependent and thus more vulnerable. Provision of financial resources is not a sole element sufficient for making the ANSF self-sustainable. ‘Doing for’ the Afghans i.e. all the procurement through project personnel while using the resources available in those trust funds will not necessarily build their capacity to take over and then undertake state functions. If the trust funds are to be fully implemented, there is need for effective monitoring mechanism, which will allow to track efficiency and effectiveness of spent resources, thus lowering down a possibility for corruptive activities.

● In post-2014 Afghanistan will continue to be a weak, fragile and conflict affected state. As the level of international support will decrease description of internal situation may be deprived of word ‘post-conflict’. It will continue to be a subject to the (New) Great Game in the region. Considering the international engagement of past decade, commitments and arrangements to pay for the ANSF in post-2014 period can be considered essential and they should be of a long term. They require a consensus among regional neighbours, which so far has not been possible.

● Considering the current world affairs and shifting political interests away, Afghanistan may gradually be deprived its priority place on the list of ‘aid darlings’. It will be unable to pay for the ANSF at its current size and costs which may lead to situation of having numerous unemployed poorly trained and equipped persons forming informal militias.

● Trust funds for the ANSF will not solve the problem of insecurity. Considering the history of Afghanistan in last 250 years, it is difficult to imagine in the post-2014 scenario the partition of Afghanistan due to internal conflict. Instead, considering internal dynamics, there is a chance of having it turn into a conflict of internal character among diverse actors, which will aim for obtaining access to resources (natural, financial, human etc.).

● A clear role of each force of the ANSF has to be established and controlled by the future government. Keeping law and order as well as assuring internal and external security will not be effective if adequate, internally coherent and complete laws are not put in place and their execution is not assured by sufficiently qualified justice sector.

● If Afghanistan is to continue on its constitutional path designed by the 2004 Constitution, in the next two decades the ANSF will play crucial role in state-building process and sustaining its effects. Within the next 20 years, in order to keep with constitutional provisions, the country will need to hold around 40 different elections. Considering the Afghan conflict analysis, each of them is extremely vulnerable to insecurity and heavy weight for the state budget. Thus well trained, financed and effective ANSF become an integral element of adopting long-term solutions for building stronger Afghanistan.

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Footnotes

6 http://www.peacekeepingbestpractices.unlb.org/Pbps/library/Brahimi%20Report.pdf [retrieved: November 2009]


A trust may be understood a separate legal entity that holds property or assets of some kind for the benefit of a specific person, group of people or organization known as the beneficiary/beneficiaries. A trust fund is a financial mechanism for the benefit of specific person, group of people or organization.


Defence System Innovations: How Procurement Makes A Difference

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Introduction

Governments throughout the world have been and remain preoccupied with achieving "Value for Money" from the goods and services they acquire and provide - an aim much sharpened by the fiscal pressures exerted in the wake of the financial crisis of 2008. The VFM framework for public procurement typically requires government officials to view price or cost as one - and an important - factor in determining purchase decisions. But it goes much further in requiring a comparison of alternative solutions in terms of "relevant financial and non-financial costs and benefits" [1]. (Italics ours.) Inevitably, difficult and subjective judgements are often required in deciding whether VFM will be or has been achieved. In addition to measurable current and estimated future life-cycle financial costs, other factors may include fitness for purpose, potential suppliers' past performance, flexibility (adaptability and innovation over the procurement cycle) and environmental sustainability [1].

In this paper, we do not wish to focus on the difficulties of applying the VFM framework in public procurement generally but, given that procurement occurs in that framework, on the factors that make it more or less difficult to achieve best outcomes where innovation is an element of the procurement, or where innovation is a broader, aspirational goal of the procurement exercise. The first of these may be described as procurement of innovation, the second as procurement for innovation [2]. Innovation goals have often formed key elements of defence procurement and the general discussion presented in this paper applies particularly to procurement conducted by or for national defence organisations. It is, of course, an aspect of the difficulty in applying VFM that it will often be difficult to know, either before or after the event, which alternative offered or achieved the best outcome in such cases. But the purpose of this paper is to explore how outcomes for innovation may be differentially shaped: (i) by the institutional framework set for a public procurement agency by government policy and (ii) by the incentives influencing the behaviour of procurement agency officials and managers within the agency.

A lively debate is underway on the role public procurement can play in stimulating, shaping and directing innovation [2-5]. As yet, however, this has not translated into a clear understanding of the causal links between procurement policy and process at the organisational level, consequences for innovation - and, if innovation contributes to VFM, how VFM is affected in such cases. As Rolfstam [5] has argued, the current focus on innovation poses a considerable challenge to established procurement practices. On the other hand:

"Given the almost exponentially increasing interest in public procurement of innovation among policy-makers, it is somewhat anomalous that there seems to be only a relatively modest corresponding development in the innovation research community presumably supposed to inform this policy development" [5 p305].

To this we would add that the issues involved await thorough and systematic treatment by the procurement research community too. Recognising the deficits in both innovation and procurement research, our paper seeks to take a step in the direction of filling the gap.

To do this, we present general arguments suggesting when procurement may work well and when it will work less well in achieving VFM through innovation outcomes. We then present a comparative case study from defence procurement to shed further light on understanding.

Types of Procurement
Not all procurement requires innovation on the part of suppliers or procurement agencies - though more may require innovation than is often recognised. In this section we present a classification of procurement types that lays the foundation for subsequent analysis - and also raises the question of whether procurement agencies may be regarded as endogenous to or independent of the types of procurement in which they engage.

In the commercial business context, purchasing portfolio models may be invoked to shape differentiated purchasing strategies aimed at generating competitive advantage for the organisation involved. Competitive advantage is here derived from hard-to-imitate procurement competences for supply chain management and inducing buyer-specific supplier investments, particularly investments contributing to enhanced performance in the customer firm [6]. Kraljik [7] offers a purchasing portfolio model that shows the way towards differentiating commercial procurement strategies to best address the business firm's strategic objectives - profit prominent among them - and this may be adapted to generate a typology of public procurement strategies where VFM is the key objective [4].

In the case of public procurement, the relevant factors shaping demand relate to: (i) the degree of standardisation sought in a given class of purchases; (ii) the extent to which a product meets needs specific to the procuring organisation. Goods and services to be procured thus fall into one of four classes: (1) standardised commodities, produced with known production methods, potentially able to meet a generic need, i.e. to meet equally well, certain requirements of multiple units or organisations (e.g. stationery); (2) standardised commodities, produced with existing technology, but requiring adaptation to meet the specific needs of a single procuring organisation (e.g. customised software); (3) specialised (non-standard) products calling for or embodying new technical solutions to address generic needs, i.e. experienced by multiple units (e.g. "green" solutions for transport requirements); (4) specialised products designed to meet the specific requirements of a particular organisation (e.g. military weapons). In the case of defence organisations, cases (2) and (4) are usually the most relevant.

Our interest in this paper is in how an individual public organisation, in particular a department of defence, may achieve VFM when it uses procurement in pursuit of innovation, or when innovation arises in the course of procurement. In Cases (1) and (2) above, the standardised nature of the product, as defined, appears to rule out the possibility of innovation in the good or service itself. But in Case (1), innovation could be pursued in a particular procurement agency or office in initiatives to pool or aggregate purchases with other public sector bodies. And in Case (2), innovation could be sought in the product (and the service-flow it offers) by requiring or negotiating adaptations to existing solutions, e.g. by working with suppliers to tailor generic software to organisation-specific purposes.

Cases (3) and (4) specifically relate to procurement that calls for the development of new technical solutions - technical innovation. It is this that appears to be envisaged when commentators say "a public agency acts to purchase ... a product ... that does not yet exist, but which could probably be developed within a reasonable period of time, based on additional or new development work - e.g. R&D - by organisations undertaking to produce, supply and sell the product" [8 p5]. In Case (3), technical innovation is sought to address a generic need of multiple organisations but in Case (4) the requirement is specific to an individual public organisation, and thus of particular interest here.

While Cases (1) and (3) will receive comment later in the paper when we consider managerial performance and initiatives in procurement, our focus until that point will be on Cases (2) and (4), which concern procurement efforts for innovation by and for a specific public organisation - albeit with VFM implications that may have implications well beyond that organisation itself. We characterise Case (2) as "simple" procurement and Case (4) as "complex" procurement. What makes Case (2) procurement "simple" is that: (i) multiple similar versions of the product (i.e. versions readily substitutable in use) exist, are in use and are familiar to actual and potential users; (ii) the technology (i.e. the methods and practices) employed in producing the product to be procured is widely known and used by multiple potential suppliers. It should therefore be relatively easy, and low-cost, for the procurement agency to specify in detail its product requirements, using existing exemplars as a base to contract for the product. Case (4) procurement is "complex" because: (i) the product itself does not yet exist (though precursors might); (ii) the technology to produce the product to be procured has yet to be developed and calls for development work, the outcome of which is uncertain. It is therefore difficult to specify, in detail, the technical and performance characteristics of the good to be procured and to formulate contract requirements that tightly link aspirations on the one hand to a physical artefact or well-specified flow of services on the other.

**Institutional framework: Source selection, contract design, local industry participation**

The institutional framework within which procurement agencies operate may be regarded as "rules of the game" set for them by government policy. The "rules of the game" on which we focus here relate to source selection strategies, contract design and industry policy objectives. (See Markowski, Hall and Wylie [9], Ch. 4, for an extended discussion of the issues at a general level, in a defence environment.) Issues in this area have been widely
discussed in the procurement literature but often sidestep implications for innovation and the consequences for achieving VFM when innovation is involved. We take each element of the institutional framework in turn and consider the VFM implications of alternative institutional arrangements for simple versus complex procurement as defined above.

Source selection strategies

A key aspect of VFM procurement calls for the encouragement of "competitive and non-discriminatory processes" [1] in selecting suppliers. On the other hand, "efficiency" in procurement as required by VFM should employ procurement methods "most appropriate for the procurement activity, given the scale, scope and risk of the procurement" [1]. The principal dividing line among potential strategies for source selection reflects the implicit tension here. Encouraging competition implies inviting bids for procurement contracts from an open field of suppliers, considering the relative merits and in some cases actually drawing on multiple sources of supply. On the other hand, supply might be sole-sourced, if the nature of the procurement ("scale, scope and risk") justifies it.

In general terms, the case for competitive tendering and supply has rested on the standard economic proposition that competition spurs efficiency, lowers prices and - where innovation is involved - allows maximum access to alternative technical solutions. The case against points to the costs of running competitions (time and effort devoted to evaluation) and resolving disputes among tenderers, and the damage competition might do to trust underpinning longstanding relationships between public agencies and contractors.

But when account is taken of the distinction between simple and complex procurement, and the innovation implications of each, it becomes clear that there are choices in invoking VFM between both: (i) competitive tendering and sole-sourcing and (ii) different forms of competition. Consider, for example, a major project calling for innovation. It is possible to identify at least four stages over the life-cycle of the project where procurement decisions could be made: design, development (prototyping), production, and in-service support and maintenance (potentially including technical updates). (Preceding design, a prior stage might also involve research.) A project involving all four stages is complex, as is one comprising either or both of the first two stages. A project involving only the third and fourth stages involves simple procurement (including, possibly, elements of organisationally specific technical adaptation).

Before we explore the issue further, notice that in an innovation-driven environment, suppliers engage with each other in two qualitatively different forms of competition: competition for a market and competition in a market [10]. Procurement agencies contemplating the organisation of a competition are accustomed to thinking about potential and actual suppliers as competing with each other in a market - offering goods or services that are close substitutes for each other and where the costs of buyers switching from one supplier to another are low. Rule-setting policy-makers may share the same view. This view makes good sense when potential suppliers are operating in well-established markets where product and production methods are known and understood, existing technological trajectories provide clear pointers to the direction of incremental innovation, scale economies are not a big issue and barriers to entry into the market are low. On the other hand, when procurement agencies seek design and development, for goods and services that do not yet exist and for which a market does not yet exist, potential suppliers should be viewed as competing to create a new market, i.e. competing for a market. Product and production methods are yet to be clearly defined, technological trajectories are still in their infancy, and outcomes from innovation are uncertain. From suppliers' point of view, the incentive to invest in design and development may either be the financial rewards arising directly from the activities themselves (in the case of specialist designers and prototypers) or from the hope and expectation of moving forward into production in the market they have created.

Obtaining VFM involves two initial steps: identifying whether a procurement calls for either or both of design and development - or not. If it does, it must be decided whether to procure these activities within an integrated project or to separate them out. As noted, if neither design nor development are called for, the procurement is "simple" and no decision is required on the second question. To contract for any technical adaptation required, sole sourcing is sometimes justified on the basis that a given supplier has specialist knowledge unavailable from other potential contractors or that an ongoing relationship needs to be preserved to ensure close supplier-customer collaboration on on-going developments. But where innovation is indeed adaptive and thus technologically cumulative, it is unlikely that no other supplier will have the competence to compete and careful consideration should be given to invoking competition in the market. In the end, much may depend on transaction costs, including switching costs. But with a focus on VFM, it is important for procurers to take the long view here since life-cycle costs are at stake and the long-term learning and innovation capabilities of alternative suppliers need to be judged.

In the event that design and/or development activities are involved - and the procurement is thus complex - the procurement agency must now decide whether to contract for design and/or development elements separately or
not. Which option it takes - and the prospects of obtaining VFM - may both depend partly on whether it is obliged institutionally to use competition or not.

If procurers are obliged to use competition, the case in favour of separating out design and development is that the rewards for participation can be adapted to the purpose. Price competition makes little or no sense when the objective is to elicit originality, fitness for purpose and other aspects of novelty but suppliers of designs and prototypes might be offered the prospects of a prize or asked to do the best they can within a stated budget. These strategies have the potential advantage of encouraging the production of a wide range of alternative solutions and, compared with sole-sourcing, offer the great advantage of giving the opportunity to "cherry-pick" among the most promising features of the solutions offered. But if the competition is conducted at arm's length from the procurers, the procurers will have little or no influence over the nature of the solutions and none of the solutions may turn out to be useful. And if the prize or budget ceiling is regarded as niggardly, the exercise may elicit only low levels of effort.

Suppose competition were considered in the context of an integrated project i.e. procuring goods and services flowing from production based on design and/or development undertaken for the project. Some suppliers may view this as an incentive to invest heavily in design and/or development on the grounds that they would benefit at the production stage. The problem here is that, viewed from the outset of the project, the riskiest and least knowable of the stages, design and development, have yet to be undertaken and their implications for production viability and costs are thus highly uncertain. Seasoned participants in tendering for government business will be well aware of the "winner's curse" - of bidding low enough in a competitive environment to win the contract but too low to account for the unknown risk and uncertainty associated with the contract. This poses any of the following threats to achieving VFM: (i) no potential supplier bids for the contract; (ii) the only suppliers who bid for the work are those unaware of the risks and potentially incapable of handling them; (iii) all bidders may bid high, despite the competitive process, confident that others will do the same.

This discussion indicates that, whether design and development are separated out or not, competition cannot guarantee VFM in complex procurements. This suggests that policy-makers might consider permitting sole sourcing as an option at the design and/or development stages while retaining competition for production and in-service support. A case for sole sourcing could be made here to build on or build up close government-contractor relationships, trust and tacit understandings so that unforeseeable problems could be addressed expeditiously, as soon as they arise. The obvious counter to this is that such arrangements give the sole source privileged access to the advantages of producing with new technology so that the idea of competition at the production stage is undermined and the potential for competitive pressure on costs and prices diluted. On the other hand, if this is truly the result of competition for a new market rather than competition in an existing one, then rents from successful innovation may be a necessary element of achieving VFM from innovation.

**Contract design**

Policy rules for procurement organisations may require the design of contract to be used. A "one-size-fits-all" approach would specify that a particular contract type be used in all procurements, simple or complex. A more nuanced approach would specify that one type of contract be used when certain conditions arose and another type when other conditions were encountered. In principle, the detail of contract design could be varied infinitely to meet varying procurement conditions.

Contract design can be viewed in terms of two different regimes: the extent to which payment is offered by way of fixed fee relative to the direct reimbursement of production costs, and the proportions in which specific and residual property rights are mixed. The first of these allows for the burden of risk to be shared in different ways between contractor and purchaser. The second implies a spectrum of contract possibilities from the purely "transactional", i.e., highly specified and non-negotiable, to the purely "relational", loosely specified, adaptable, and continuously and flexibly negotiable. The variations in contract design are highly relevant to the contrast between simple and complex procurement and choosing the appropriate contract type in each dimension becomes an important element in achieving VFM. To the extent that policy rules point purchasers in the direction of contract designs ill-suited to any procurement task they face, favourable outcomes may be imperilled.

Familiar forms of contract design include Firm or Fixed Price (FFP), Cost Reimbursement (CR), Cost-Plus (CP), and Cost-Sharing (CS). Under the first regime, the contractor's entire payment takes the form of a fixed fee agreed with the procurement agency at the time of contract award, irrespective of their production costs in undertaking the contract work. Under CR and CS, there is no fixed fee. Under CR, the contractor is simply reimbursed all audited production costs; under CP, all audited production costs are again reimbursed but now with an additional amount constituting profit. Under CS, a fixed fee may once again be paid but, in addition, production costs are shared between producer and buyer. In terms of the transactional-relational spectrum, any of these contract types could be
transactional, as long as the fixed fee is clear and/or details of the link between production costs and reimbursement are well specified (e.g. the basis for auditing costs is agreed). Under relational contracts, calculations ex ante might reveal that payments reflect an equivalence to, say, CS with a given fraction of costs borne by each party. But there would be no commitment to adopting one framework for cost reimbursement rather than another. We now comment on the implications of the alternatives for simple and complex procurement in turn.

- **Simple procurement.**

Under FFP, contractors have an incentive to minimise production costs in order to maximise profit. While FFP is often represented as shifting all risk from buyer to producer, the producer's incentive to save on costs may, even with simple procurement, lead to quality dilution and, where technical adaptation is included as the innovation element of the procurement, less might be done to adapt existing solutions to the particular needs of the buyer than might otherwise be the case. On the other hand, while CR and CP remove the incentive for skimping on quality and adaptation, they introduce a temptation to "gold-plate", adapt needlessly or undertake innovation for the benefit of the contractor rather than the buyer. While CS may ameliorate the latter class of problems, procurers are then left with the difficult problem of how much (or how little) to incentivise quality enhancement and adaptation through cost-sharing. It appears that, in an uncertain world where the sources of uncertainty vary, much may hinge on the distribution of information between buyer and suppliers [11]. Sometimes, with so-called "symmetric uncertainty", both sides share equal uncertainty about the potential of external factors to raise costs during the procurement but know all they need to about the performance characteristics of a supplier. In other cases, with so-called "asymmetric uncertainty" contractors know their own cost schedules but the buyer does not.

Even with simple procurement, it appears with the forms of uncertainty described above, best to avoid either FPP, CR and CP and instead to employ CS. In the symmetric case, best results may flow from burdening the public purse with the lion's share of costs when external sources of uncertainty are greatest, i.e. when least is known about the prospects of achieving successful adaptation for reasons beyond the control of either party. In the asymmetric case, procurement agencies should seek to "smoke out" cost-efficient suppliers by offering to bear only a modest share of the costs, on the assumption that only cost-efficient suppliers can afford to take the bait and still make a profit. When both forms of uncertainty occur simultaneously, however, we have already noted in the previous section that this strategy runs the risk of frightening off any supplier at all.

- **Complex procurement**

In the case of complex procurement, we noted earlier that price-based competition made little sense when a new design or prototype is sought. Analogously, a contract focused on price alone - FPP - is unlikely to elicit the desired innovation response: the product or output from the procurement for which a price has been fixed cannot be specified, precisely because the product does not yet exist. CP may fail the efficiency requirements within VFM on the grounds that costs may be incurred that are not directly related to the project or overstated when not closely audited.

The resolution to this conundrum may be to resort to a cost-sharing contract, or a more relational form of contracting, at least in the early stages. As in the more general case, cost-sharing leaves open the difficult question of how best to share the costs under complex procurement. The case study illustrates the difficulties when this approach was applied in Australia to procuring a hi-tec radar system.

In summary, even with simple procurement, FPP will not achieve VFM if innovation is involved. CS is preferred but the most effective way of determining the terms of the cost-sharing (the relative shares of the costs borne by buyer and supplier) to maximize VFM remains unresolved. With complex procurement, FPP cannot do the job because it focuses on price alone and, because it relates to a requirement for a product that does not yet exist, cannot specify the requirement sufficiently well to elicit it. CP may fail the efficiency test required by VFM - though innovation makes it difficult to know whether efficiency has, in fact, been violated. Complex procurement, at least at the early stages, may points to a need for relational rather than transactional contracting.

**Industry policy objectives**

Industry policy objectives which policy-makers may require procurement agencies to pursue broadly relate to procurement in support of domestic industry performance and outcomes that would not be explicitly be taken into account by procurement processes designed solely to achieve VFM for the organisation involved, or focused purely on financial metrics. Traditionally, such objectives have been related to employment creation generally, employment in regions of high unemployment, capability building and skill enhancement, export promotion - and innovation. In the case of defence procurement, security of supply, or some version of "self-reliance", is an
additional objective - although this is more a perceived national security policy objective applied to industry than an industry policy objective per se. The pursuit of such goals may be viewed as an attempt to achieve VFM from procurement, defined with respect to a much broader range of hoped-for economic and social benefits than those indicated in the Introduction.

To assess the potential for innovation-related procurement to achieve VFM in this broadly defined manner, two steps are necessary. First, we must judge the potential to achieve more or better innovation from the application of industry policy objectives within public procurement. Note, we are not asking here whether public procurement generally can influence innovation but whether incorporating industry policy objectives into public procurement will make a difference for innovation, compared with not incorporating such objectives. Second, we must judge whether any innovation-related changes that might occur as a result of incorporating industry objectives in procurement will then have the consequential effect of enhancing VFM.

On the first question, notice that pursuit of industry policy objectives may potentially influence innovation either directly or indirectly. Direct effects relate to explicit requirements in the public procurement process to make choices specifically with a view to influencing investments in innovation in local industry that would not otherwise have occurred. Indirect effects relate to innovation-related side-effects, intended or intended, flowing from the pursuit of higher employment, general capability-building and export promotion. Given our focus on different procurement types, both direct and indirect effects might apply either to the sort of incremental, technical adaptations typical of simple procurement or to the discontinuous, potentially disruptive technological and product innovations that more often characterise complex procurement.

Whether, to what extent and in what form innovation occurs depend, as noted earlier, on what is sought and how the procurement is handled. The prospects for generating new technical solutions are likely to be better for incremental changes extending an existing technological trajectory than when procurement agencies call for products and processes that do not yet exist; competition (though of varying kinds) spreads the net more widely over potential suppliers of solutions than sole sourcing and thus increases the probability of extending the list of possible solutions, for both adaptive and discontinuous innovation; contracting for cost efficiency runs the risk of diluting efforts to pursue innovation leads and investments. Given the very wide scope of innovation, it hard to generalise but existing empirical research suggests notable successes in a few famous military cases requiring fundamental research, design and development (e.g. semiconductors, the Internet) and a mixed bag in the large majority of cases where less ambitious innovation is called for. Work on procurement-related defence offsets programs, designed to encourage the transfer of technology from the USA to Australia [12-13], suggests very little innovation flowed from the policy and Australia’s Department of Defence has recently commented: "In general, offsets and quotas do not work." [14]. A spirited case in favour of demand-oriented defence procurement policy for innovation in Australia is mounted by Thurbon [15] but evidence on the extent to which VFM has been achieved, whether narrowly or broadly construed, remains inconclusive.

The question of VFM, in itself, deserves independent attention. Even if it can be shown that procurement overlaid with industry policy objectives has stimulated innovation that would not otherwise have occurred, was the innovation worth having? Innovation per se is by no means always of social benefit and, when the associated costs are included, may not be of social net benefit. Whether, in individual cases, an innovation is of social net benefit is a highly controversial question related to evaluating the full menu of benefits including externalities and spillovers, complementarities between one innovation and others, and taking account of future effects. Here we restrict ourselves to the following observations:

- given the incontestable practical and empirical difficulties of judging the potential benefits and costs of innovation in particular instances, the case for including it as a selection criterion for awarding procurement contracts, necessarily in relation to work yet to be undertaken, is logically open to question. This comment applies with increasing force to VFM, the more a contract is envisaged to include design and development.
- industry policy objectives related to innovation have an air of irresistible public good that may be lacking from efforts to create jobs in one region at the expense of another. While the true political reason for awarding a procurement contract may be to garner votes in a marginal constituency, invoking the potential for innovation may be a useful overlay or mask. The actuality may be that innovation prospects are poor to non-existent and that VFM is not therefore well served by the choice.
- industry policy objectives related to security of supply for national security reasons need to be more closely scrutinised for both their own merits and for concealing other agendas than they often are. Given the risks associated with innovation, security of supply might often be more readily achieved in any case by a more conservative approach to production.
- genuine progress in deriving value from innovation always takes time. Assuming a positive social rate of discount or time preference, the longer it takes for benefits to accrue, the smaller is their value in present
day terms. Innovation that offers a potential benefit of $1m p.a. for ten years thereafter, but with a delay of a decade, is less worth pursuing through procurement than innovation that offers the same annual benefits, starting in two years' time. That, in turn, implies procurers should be at least as interested in cases where solutions are available in the near-term as they are in a longer-term future - which implies building more on existing trajectories in pursuing VFM than hoping for new ones to be established.

- as noted earlier, innovation is always a risky undertaking. A reasonable characterisation of the distributions of VFM returns for simple as opposed to complex procurement might be: innovation undertaken within simple procurement has a relatively modest mean value with relatively small variance around the mean; innovation within complex procurement has a relatively high mean value with relatively large variance around the mean (and probably significant skewness displaying a long tail at the upper end). Industry policy objectives for innovation in procurement are unlikely to be couched in these terms - implying policy-maker indifference among different innovation distributions. Procurement agencies obliged to pursue innovation goals should undertake their own analysis of the distributions and take account of the implications of expected mean, variance and skewness in VFM as they apply innovation criteria.

In summary, incorporating innovation-related innovation objectives in procurement policy presents procurement agencies with profound logical and implementation problems - of which those who formulated the policy-rules may well not have been aware. Our comments above, however, suggest that innovation goals as a discriminating criterion among potential suppliers might be taken seriously for achieving additional VFM in cases of simple procurement where technical adaptation builds on existing solutions. But where complex procurement requires design and development, it is difficult to argue with conviction that procurers can know what choices will achieve VFM. Industry policy objectives explicitly focus on building innovation capabilities domestically. It is a task for the policy-rule-setters to determine, with information and advice from the procurement agencies, whether it might not sometimes be preferable to buy into the fruits of innovation developed on trajectories built overseas.

**Procurement Agency Internal Arrangements and Incentives**

Not much of the literature on employing public procurement for innovation is devoted to internal organisational arrangements within the procurement organisation itself. Yet, as is clear from the above discussion, procurement agencies and offices face challenging problems in this area even when they have policy rules to follow. The business procurement literature has focused on:

- how procurement staff might become involved with suppliers in new product development projects - for example, in managing make-or-buy decisions, the supplier interface and product specification [16-17]
- whether they should become closely involved - for example, when there are good prospects of truncating the concept-to-customer development cycle, reducing development costs and joint problem solving, but bearing in mind the risks of information leaks, control loss and interpersonal conflict [18-20].

Much of this carries over into the public procurement domain but with the added caveat that procurement officers must satisfy public accountability criteria involving probity and transparency so that close involvement with suppliers may be hard to justify if it disturbs, or is perceived to disturb the "level playing field" on which suppliers are supposed to play.

So what can be said about the internal organisational arrangements most likely to encourage innovation-inclusive procurement that achieves VFM?

Procurement managers may seek to operate on: (i) *product* innovations (changing the nature and quality of goods and service inputs into their organisation and thereby the nature and quality of the organisation's own outputs); and/or (ii) *process* innovations (aiming to reduce costs for their own organisation by inducing cost-savings among suppliers or cost-savings from procurement itself). Product innovations may be seen in product adaptations that fall under simple procurement - such as those that involve specific or niche adaptations of generic IT solutions or systems. Or they may entail entirely new products that form part of complex procurement. Process innovations may appear as the result of suppliers’ in-house RD&D or their licensing and effective use of new imported technology. But a process innovation in the procurement organisation itself could include the sort of pooling and aggregation of purchasing with other procurement bodies noted earlier.

All such innovations require some degree of entrepreneurial activity which, in turn, involves risk-taking with public funds. When public accountability, probity and transparency are brought into the picture, however, it becomes clear that the constraints for public officers are different from those in the private sector. Commercial procurement officers aim to derive competitive advantage from their efforts which, ultimately, is measured in terms of long-term profitability. Short-term mistakes are forgiven if long-term results are good, i.e. if, on average across many
decisions, overall results turned out profitably. On the other hand, public sector procurement officers are held accountable on a decision-by-decision basis. One mistake may cost them promotion or even their job [13,21]. What this might seem to imply is that the greater the risks procurement officers are required to take, the more they should be compensated. And in formal analysis it has been shown that if "high-powered incentives (are incorporated) into general terms and conditions of public service employment, high levels of innovative effort might be achievable" [22: p459].

One catch, however, is that for this to happen, the procurement function may need to be "hived off" from the organisation(s) it serves so that the different compensation conditions can be implemented. Another, potentially more serious, issue relates to the degree of risk aversion actually found among procurement officers and how it might be identified. The more risk averse a procurement officer, the more he/she should need to be compensated for taking any given level of risk - but there is no way of knowing, objectively, how risk-averse an individual is and individuals have every incentive to say they are highly risk-averse (whether they are or not) if their remuneration is linked to the degree of their risk-aversion.

Case Study

As with many cases when innovation is brought into the picture, the implications for organising for best results, here defined in terms of VFM, are difficult to determine with clarity and lack of ambiguity. The can be problems in identifying whether and in what ways public procurement elicited innovation that would not otherwise have occurred. But beyond that are the even more severe issues of determining whether the resources devoted to eliciting the innovation achieved VFM. In this paper we look to a comparative case study of innovation-directed procurement in the defence context for insights on these questions. We note that defence has traditionally been a context in which procurement-for-innovation has been pursued but that the notion of VFM in that context is perhaps even more contentious than in most civil environments. The reason for this is the flow of services or benefits produced by defence organisations take the form of a public good, national security, that is contingent, not traded in the market and whose value is always open to political debate. The VFM achieved by innovation that defence procurement elicits is a derived value rooted in the value of defence output itself [9]. That said, if similar innovations are procured at widely varying costs, there appears to be prima facie evidence that VFM objectives have been better served by one than the other.

In this case, we compare two radar-related innovations developed in two countries, Australia and Sweden, comparable in terms of their economic development and military aspirations. Both innovations involved complex procurement as we have defined it, but we argue later that there may have been greater complexity in the Australian case than the Swedish. In Australia, a land-based, over-the-horizon radar (OTH) broad-area surveillance system called JORN took the better part of two decades (1986 - 2003) to bring into operation from the date of decision-to-acquire at an estimated cost of $A1.24 billion to the public purse. In Sweden, an airborne radar called ERIEYE, also designed for broad area surveillance, was developed in about ten years at a cost the fraction of its Australian counterpart. It is also of interest that ERIEYE and later-developed variants have had success in export sales while JORN has operated successfully in Australia but not entered export markets. We now compare the procurements in the light of the issues raised above. In every dimension we have discussed, there were clear differences.

In terms of source selection, the Swedish approach to defence equipment was essentially to sole source, while Australia followed a qualified open tender process. Beginning with commissioning feasibility studies in 1978, FMV (the Swedish defence procurement agency) engaged Ericsson Microwave Systems, the Swedish radar experts, to design, develop and produce EYIEYE. Reflecting the corporatist framework operating in Sweden, all terms and conditions were negotiated on a one-to-one basis: no aspect of the work was ever tendered. The corporatist approach had been established during the Second World War and maintained subsequently as what was perceived as the most effective way of mobilising national resources for national defence. Ericsson had developed its radar expertise under the umbrella of the high value consistently accorded by Swedish defence actors to indigenous expertise. This approach, formalised in Australian Government procurement guidelines, reflected the conviction that VFM was best achieved by "open and effective competition" (in reality, a somewhat constrained version of full and open competition which recognised the transaction costs associated with the latter) - which, in practice, often meant overseas sourcing, particularly in advanced electronics including radar.
Sweden’s government decision-makers had been reinforced in their preference for sole-sourcing when they observed Ericsson’s proven record of supplying militarily competitive radars that had enabled the Swedish Airforce to meet its commitments since 1948. As noted earlier, a case for sole sourcing could be made to build on or build up close government-contractor relationships, trust and tacit understandings so that unforeseeable problems could be addressed expeditiously, as soon as they arise. In this case, the EIREYE procurement built on and extended the radar-related learning accumulated by Ericsson over earlier contracts and close contact between the firm and the government. The effectively path-dependent development from which EIREYE benefited contained costs and supported timely delivery. Given its historic dependence on overseas sourcing, Australian suppliers had lacked the opportunity to accumulate comparable knowledge to that developed in Sweden. When the prime contract was initially awarded to a Telstra-GEC Marconi consortium - in pursuit of a heightened enthusiasm for “self-reliance” (see below) - the successful tenderer formed part of a local industry base that was less equipped with the relevant capabilities required for the task than Sweden’s. As noted earlier, competition in source selection may not discourage or prevent suppliers bidding for work who are unaware of all the risks involved or potentially incapable of handling them. In the event, even combining overseas expertise with Telstra’s domestic capabilities proved inadequate for the task and control was lost of both schedule and costs.

In terms of contract design, Sweden adopted a mix of cost plus and fixed price contracts while Australian procurement of defence capital equipment followed, in principle, a fixed price approach. Feasibility studies undertaken by Swedish industry were funded by FMV on a cost-plus basis, as were concept demonstrators and production prototypes. Given the resulting technological and project knowledge shared symmetrically by both customer and supplier, contracts were then awarded for production on a fixed price basis. In the event, when development costs exceeded estimates, the Swedish customer was prepared to negotiate price adjustments with the contractor to ensure the continuity of the project and ongoing innovation (as happened in the early 1990s with the development of the JAS 39 Gripen fighter). In the case of JORN, procurement was shaped, in general terms, by the preference of DMO (Defence Materiel Organisation) for “turnkey” contracts in which the customer specified performance and the prime contractor assumed most of the cost schedule and technical risk in designing and producing an artefact that complied with the specified performance. Given that JORN was a development contract, DMO sought to give due recognition to cost, technical and schedule risk but limit the exposure of the Commonwealth to those risks. To do so, it instituted a target price incentive (cost-sharing) contract in which the customer and supplier shared the pain of contract under-performance and the gain of contract over-performance up to a specified threshold. Beyond that threshold, the contract reverted to a fixed-price arrangement under which the prime contractor bore the brunt of any cost and schedule overrun.

In Sweden, flexible contract design arrangements at the design and development stages yielded sufficient and symmetrical knowledge of both risk and benefits to both parties. This provided common ground on which the parties could negotiate at the production stage to modify the FP arrangements when innovation goals appeared to be threatened. Within that framework, both cost and schedule implications could be taken into account. In Australia, the “turnkey” framework and the government’s arm’s length reliance on financial incentives to generate performance combined with contractor incompetence to cause costs to get out of hand and schedule to slip. By 1996, 80 per cent of the JORN prime contract target price had been spent, 80 per cent of the schedule had elapsed, but only 20 per cent of the system’s configuration items had passed the critical design review stage [23].

Turning to local industry involvement considerations, domestic industry participation in Sweden’s defence procurement commanded a wide-ranging consensus throughout the Swedish polity that flowed naturally from the commitment to armed neutrality and the associated demand for a neutral technology. Local content premia were kept within politically acceptable bounds by Swedish industry accessing Western, especially US, advanced technology on a selective basis. (For example, Volvo Flygmotor built high performance aero-engines for the JAS 39 Gripen and other Swedish fighters under license to US manufacturers.) In the case of EIREYE, Ericsson Microwave System engineers accessed US micro-electronics in order to reduce the cost of electronically scanned array technology that formed an essential element of the system and, as it turned out, contributed significantly to cost efficiency [24].

In Australia, local industry participation in defence capital equipment procurement (pursued through the Australian Industry Participation (AIP) program) was an adjunct to procurement, primarily designed to foster local industry capacity to repair, maintain and adapt equipment in service. In the case of JORN, a key objective was to develop local capacity for ongoing development of the system through control of the software required to improve the system’s accuracy and sensitivity. When Telstra was awarded the initial contract, one objective was to foster a “national champion” able to undertake this and similar projects in pursuit of the then strategically elevated enthusiasm for defence self-reliance. While Australia was prepared to pay a premium for the development of local industry capabilities, the procurement agency, DMO, overestimated the efficacy of the target price incentive contract as a means of controlling cost and schedule. As a consequence, the premium, in the event, much exceeded
initial expectations - resulting in the replacement of the initial contractor with an overseas-led consortium, RLM, and the abandonment of any idea of promoting a national champion.

Finally, we deal with the characteristics of the two procurement agencies, FMV and DMO, and the implications of these characteristics for the behaviour of their procurement staff. Again there are instructive differences. In the case of Sweden, FMV, its defence procurement agency, operates effectively autonomously within a broad framework of the elected government’s policy objectives and resource allocations - a distinctive feature of Swedish governance that can be traced back to the reaction to Gustav Adolfs’ ill-advised intervention in the design of the Vasa warship in the 17th century. As a consequence, Swedish procurement officials have been prepared to experiment in the interests of achieving innovative solutions to military capability requirements and to learn from the failure of those experiments. The Swedish system can therefore tolerate failure in procurement experiments as part of the learning process. While this necessarily implies a tolerance for risk-taking, the potential costs associated with risk-taking are ameliorated by the knowledge base resident in the procurement staff of the organisation. This knowledge comprises three complementary elements: detailed understanding of supplier capabilities (through corporatism), comprehensive engineering competence that provided a detailed understanding of the technology, and a detailed understanding of the user requirement enabling them to make informed choices and trade-offs. Transaction costs are contained through exploitation of dense customer-supplier networks and the tacit knowledge and understandings on which they build. This informed risk-taking approach contains and reduces risk in decision-making on the one hand but also gives decision-makers more confidence to take risk when they feel it justified, knowing that adjustments and adaptations can quickly be made if required.

In addition, Australian project governance may combine with risk verse project managers to inhibit effective management of inevitable difficulties. There is evidence that this occurred in the case of JORN when risk-averse procurement officials initially relied on the JORN contract’s financial penalties to motivate Telstra to deliver cost-efficiently and on time. When it became clear that Telstra was having increasing difficulty in meeting its contractual obligations, Defence project managers’ willingness and ability to intervene effectively was inhibited by their arm’s length relationship with the supplier and their fears that such intervention would expose them through their career prospects, and their organisation (DMO), the Department of Defence and the Commonwealth to liability for any adverse results [25]. Some of these managerial deficiencies and governance difficulties were rectified in revised contracting and project management arrangements subsequently forged with RLM. But risk-averse attitudes among procurement officials remained - and remain - a reality nonetheless [15].

**Conclusion**

We have focused in this paper on the difference procurement - and, in particular, defence procurement - makes for achieving VFM through innovation. With that in mind, we have argued that procurement may be defined as “simple” or “complex” according to the degree and type of innovative activity envisaged: “complex” unambiguously if design and prototype development is involved, “simple” if not - but even if simple, still potentially involving technical adaptation.

Argument from general principles has suggested that the VFM implications of procurement (complex or simple) involving innovation is sensitive to the nature of the procurement process and features of the procurement organisation. Competition, or the lack of it, in source selection can have consequences for the range of alternative solutions potentially available for consideration, the willingness of potential contractors actually to propose such solutions, the flexibility to adjust in the light of learning during the contract, and the efficiency with which solutions are ultimately delivered. Contract design can have implications for the enthusiasm with which a contractor pursues innovation, as well as cost saving, within a contract. Externally imposed industry policy objectives usually lead to the payment of premia for undertaking work locally and may or may not generate a long-term legacy of assets and capabilities of value to society. Internal arrangements within procurement agencies can encourage or discourage innovative behaviour but usually have to compensate for risk-aversion likely to be most observable in polities where accountability and transparency are highly prized. But in none of these dimensions are predictions completely clear-cut, especially if the notion of VFM being applied remains ambiguous. This suggests the value of drawing on insights from case studies.

In the defence procurement case study presented here, both of which called for innovation, outcomes were quite at variance with each other. And we have argued that source selection, contract design and industry policy all played their part in explaining the different outcomes. Perhaps counter-intuitively on general grounds, competitive sourcing appears to have served Australia relatively poorly while sole-sourcing served Sweden well. On the other hand, the nature of the competition in Australia was qualified by aspirations for “self-reliance” which constrained the choice of a prime contractor to local business organisations while sole-sourcing in Sweden had the advantage in
this particular case of focusing on an established world leader in the field of supply. The arm’s length nature of contracting combined with procurement agency reliance on in-built contractual financial incentives and penalties appears to have undermined the potential to reshape or rescue the failing innovation process at Telstra-Marconi in Australia. In both countries, aspirations for defence industry autonomy - supporting armed neutrality in Sweden and “self-reliance” in Australia - encouraged government commitments to “make” rather than “buy” advanced radar systems. But pre-existing differences in the breadth and depth of the two countries’ defence industry bases made a crucial difference to the consequences. Here, history counts, and in all the dimensions we have considered, it is dangerous to generalise from one time and place to another - which also helps explain the diversity of results in the evidence on procurement-innovation outcomes.

But there is more.

What has become clear is that the nature of the complexity involved in each case is different, and relates to characteristics of the innovation system as much as to technology and product specification. In an essential dimension JORN may have been a more complex procurement than ERIEYE - and, indeed, it could even be argued that ERIEYE is a borderline case between what we have called “simple” and “complex”. What we mean by this is that, in the area of radar innovation, Australia had less experience than Sweden in converting scientific research into feasible technical and engineering plans, and in taking such plans on to the point of an operational system. Both countries embarked on a path where alternative solutions presented themselves at key points along the way and where the best way forward could not be known with certainty before the event - and, possibly, even after it. But Sweden - Ericssons in particular - had been there before and had experience in making choices in such an environment. It could draw on existing solutions to an earlier class of related problems and this meant that it had ways and means (even if only heuristically) of handling the choices before it. In one sense, the innovation in ERIEYE was adaptation - but that understates how much new thinking had to be put into bringing the project to successful technical consummation. For Australia, the job of handling the uncertainties it faced was something it had to learn without the benefit of prior experience. This made the whole enterprise more complex in a fundamental sense of the word - for the actors involved - in Australia than Sweden and helps explain why the innovation took longer to deliver and incurred higher costs.

References


Defence management research capacities and topics: Blind spot defence acquisition management?

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Abstract (done)

Universities and other kinds of research organizations are potentially important sources of inputs for defence management research and related innovation. However, the different research organizations focus on diverse aspects of defence management with key topics ranging from politics, security issues, military strategies, military analytics, industry lobbyism to administration and management. Opposed to defence politics, procurement or defence acquisition is only one, very specialized functional area of interest for many research institutions. Thus, this working paper analyzes the shattered landscape, the role, and focus of defence research institutions by applying a deductive review methodology. The mapping of research capacities and topics roughly followed three consecutive steps. Firstly, an analytical framework was developed in order to help understand key topics and in order to help aggregate and generalize later findings on defence management and defence acquisition. For this purpose a brief overview on public management and governance theory is provided. Second, research organizations were identified and classified according to their perspective on defence management and defence acquisition. Third, the specific topics of the identified research organizations were analyzed with respect to defence acquisition. For this purpose a defence research database was created and used and content analysis methods were applied. The findings were expected to create a first overview on the research landscape with propositions for further research or deeper collaboration between the research institutions. Additionally the research landscape allows for quickly identifying experts and focus groups for further research.

Keywords: defence acquisition, research centres, research mapping

Setting the frame: An introduction to European defence

The financial crisis has put a strain on defence budgets worldwide and in particular across the EU28 member states. As public debts are likely to remain high, further cost cutting measures are to be introduced in many EU member states to cope with the on-going financial pressure (Mölling et al., 2014). Cost-cutting measures seem to be appropriate in peacetime, as the military must be cost efficient, but modern forces should be prepared for an unexpected crisis and mobilisation, where costs performance and effectiveness is all that matters (Juntunen et al., 2012). The need to efficiently and effectively allocate resources implies that economic considerations about defence management gain importance.

As a matter of fact, there remain significant gaps in coverage of the literature in defence economics (Hartley, 2011). Given the paucity of academic research into the general area of defence management, there is obviously a considerable potential for focused research and application of ideas and concepts (Taylor and Tatham, 2008). One focus could be on defence acquisition, as costs for acquiring new equipment or maintaining elder systems have risen by up to 7.5% to 10% per annum in real terms resulting in a doubling in unit costs between successive generations of equipment every decade (Hartley, 2011). Even worse, a study in the United Kingdom revealed, that the 25 largest defence equipment projects not only exceeded their forecast costs, but also entered service over three years later in the average, even then struggling to deliver the agreed full capabilities (Taylor, 2003). Overall, it seems that the field of defence acquisition still poses economic potential, while on the other hand there seem to be many open questions and improvements.
The theoretical analysis of defence acquisition becomes very difficult as it is not a purely economic issue but rather a mixture of economic, political, strategic, psychological, cultural and even moral aspects (Dunne and Nikolaidou, 2012). One aspect in this discussion is initial purchase costs of a military system, which is only a fraction of the total cost of operating or maintaining it throughout its life. The figures can be particularly startling for defence equipment because, typically, it will have a long service life – 25 years is not uncommon (MoD, 2001). So politically influenced acquisition decisions might have severe cost impacts in the future. Another aspect is the discussion about approaches which might improve defence acquisition efficiency, e.g. multinational programmes and their prospect to generate economies of scale by pooling national demands and requirements. National acquisition officials fear the risk of high co-ordination costs and that programme management complexity and problems increase in a non-linear fashion as the number of partner countries increase (James, 2012).

The mentioned aspects show, that also a managerial perspective on defence is necessary. In fact, the discussion about defence management is anything but new. Speaking for German literature “Militärökonomie” developed early in the 19th century (e.g. Hübler, 1823). Today, there are numerous scientific journals and media researching defence, e.g. the journal “Defence and Peace Economics”. Also numerous different research institutes or competence centres exist, which explicitly research defence. Examples are the “European Union Institute for Security Studies” located in Belgium or the “Centre for Defence Studies” located in the United Kingdom. Relatively contemporary developments resulted in a more focused research also on defence acquisition issues, in terms of specialised journals, such as the International Journal of Defense Acquisition Management (IJDAM, first issue in 2008) and focused research centers, such as the “Centre for Defence Acquisition” located in the United Kingdom.

Alongside the above mentioned developments, it seems that numerous different research institutions focus on rather diverse aspects of defence management with key topics ranging from politics, security issues, military strategies, military analytics, industry lobbyism and defence acquisition. Therefore, this paper follows the guiding research questions:

1) What is the institutional status quo of defence management research?
2) Which defence acquisition topics are addressed?

The remainder of the paper follows the sequence proposed by Denyer & Tranfield (2009). The section on the analytical framework provides a brief overview on how the framework was developed and gives an overview of the final framework, which is later on employed for aggregation and explanation. The methodology section provides precise details of how the review was conducted, including the search and data extraction strategy, the selection criteria and the criteria for analysis and synthesis. The findings and discussion section contains a summary of all data extracted from the web-search and describes the nature of the extracted data in the sample. The section on the findings and discussion also specifies which topics are covered through the examined research organizations and which topics could be explored further. The section on the limitations of this study elaborates on restrictions and provides recommendations for further research needs and improvements. The conclusion section provides a summary of the review (Denyer & Tranfield, 2009).

Analytical framework

This research investigates the research capacities and topics in the field of defence management and defence acquisition. In order to capture the variety of topics or expose little or unhandled issues in defence management and defence acquisition in contemporary research organizations, the subsequent framework was developed. In order to adhere to the design criteria suggested by Holsti (1969) the framework is configured in such a way, that all major subject areas can be detected. It is derived from a theory-led point of view with brief insights into corresponding literature. The topics are distinguished from each other, so that an overlap of categories can be avoided. It is also required, that the categories can be evaluated independently of each other (Glock & Hochrein, 2011). The analytical framework is used at a later point in time to aggregate and explain collected data on research organizations.

Brief glance at theoretical foundation in public management and governance theory

The starting point for the systematic analysis of ‘defence management’ and ‘defence acquisition’ is a brief glance at the theoretical framework proposed by Lynn, Heinrich & Hill (2000) on the governance and management in public sector entities. By taking into account the question on how public sector regimes, agencies, programs and activities can be organized and managed to achieve public purposes they developed a unifying framework. In this unifying
framework public management is embedded into the context of governance theory. Whereas public management summarizes discretionary actions, activities and decisions of actors in managerial roles subject to formal authority, governance theory describes the formal and informal structures that predispose these actions, activities and decisions (Lynn, Heinrich, & Hill, 2000). Both interacting elements, public management and governance, affect outcome and performance of a public sector entity (Lynn et al., 2000; Pilbeam, Alvarez, & Wilson, 2012). Lynn, Heinrich & Hill (2000) summarized their findings in broad categories in a reduced-form model of governance and public management. According to that framework a certain, targeted output (results and performance) is a function of the other categories, namely “Environmental factors (Contextual factors)”, “Client characteristics (Stakeholder characteristics)”, “Treatments (Processes, interventions and decisions)”, “Structures (Formal and informal structures)” and “Managerial roles and monitoring & controlling actions” (Lynn et al., 2000). For each of the general categories they provided a list of sub-categories and characteristics. These sub-categories are not further elaborated on at this point in time and will be discussed during the application of the framework to the fields of defence management and defence acquisition. The framework proposed by Lynn, Heinrich & Hill (2000) is summarized in the figure below.

**Figure 1:** Public Management and Governance Framework (Lynn et al., 2000; Pilbeam et al., 2012)

Seen from a general perspective, the identified broad categories in the reduced-form model are included a priori in any particular logic, model, or theory of governance or public management (Lynn et al., 2000). The value of this kind of model lies in its strength to provide a broader context for empirical analyses when drawing conclusions from collected (and most often incomplete) data and information.

In the context of this working paper, the framework has been selected, as it provides a ‘toolbox’ for research in the field for public management and governance (Lynn et al., 2000). Its findings can be easily transferred to the defence sector and its management challenges. Another reason for selecting this framework is its compelling structure in which researchers can locate particular theories and managerial themes and describe their dependencies. As a starting point it helps to conceptualize the research and additional categories might by introduced gradually into the initial model at a later point in the research process (Denyer & Tranfield, 2009; Lynn et al., 2000).

**Explaining defence management and defence acquisition**

Building on the generic framework provided by Lynn, Heinrich & Hill (2000) the topics ‘defence management’ and in particular ‘defence acquisition’ were examined. The objective of this examination is to provide general insights into both themes from a managerial perspective. In a subsequent step research organizations and corresponding areas of research are explored.

The term "defence management" is not uniformly discussed and defined in the literature (Barber, 2013; Bucur-Marcu, Fluri, & Tagarev, 2009). From an institutional point of view, the management of defence is situated between defence policy formulation (politics) and actual command and control of the operational military forces (Tagarev, 2009). Hence, responsibility for defence management in the wider sense lies with the civilian and military managers in the department of defence (Bucur-Marcu, 2009). Typically the department of defence runs several different defence agencies. Defence agencies usually perform business like operations and processes in order to supply or service activities that are common to more than one military branch or department. So in the narrow sense, defence management is performed in the various defence agencies. While most of the defence agencies operate on a national basis, there are also defence agencies on an international level. The European
Defence Agency (EDA) is just one example for a management entity that is tasked to manage common defence acquisition activities on a multinational scale. The underlying idea of modern defence management is however, that it is able to achieve desired goals and objectives in an efficient and effective manner (Ratchev, 2009).

A more detailed view on defence management reveals, that the overarching objective of managers in defence management is to effectively and efficiently implement national and international security and defence policy goals (Bucur-Marcu et al., 2009). These policy goals and objectives are often generically described and contain goals such as the contribution of armed forces to national security in peace times, to the peace and security in the world including securing allies and friends or the participation in the defence of the country (Tagarev, 2009). In order to make the defence objectives more tangible and measurable a certain level of ambition is set or introduced (van Eekelen, 2009). The description of the level of ambition provides a specific formulation of the expectations of the government regarding the different roles the armed forces should fulfill. These descriptions contain for example, an overview on operations they should be able to carry out on their own (together with other militaries or with other security sector organizations), the quality of personnel and the technological level of the armed forces (Tagarev, 2009). Thus, managers in defence management are tasked with the implementation of these objectives at the set of level of ambition. Therefore they configure, obtain and maintain required civilian and military capabilities, structures and processes.

In pursuing and implementing security and defence policy objectives, actors in defence management are influenced and driven by exogenous and endogenous contextual factors (Georgiev, 2010). Following Lynn, Heinrich & Hill’s (2000) proposal in a general public management context, the exogenous contextual factors contain influences from international binding agreements and policies, from national political structures and monitoring authorities, from the performance of the economy and corresponding funding constraints or dependencies, from market structure and degree of competition, from readily available technology and from technological dynamism (Lynn et al., 2000; Tagarev, 2009). In a defence management environment additional external factors such uncertainties, hazards and risks (Pilbeam et al., 2012) arising from short- and long-term threat scenarios apply. Gansler and Lucyshyn (2005) summarize these threat scenarios into challenges originating from asymmetric warfare, terrorist attacks, acts of piracy or threats from technologically advanced countries with unstable governments (Gansler & Lucyshyn, 2005).

The endogenous contextual factors include the organization’s own resources situation, internal relationships and the organizations’ own (corporate) culture (Ratchev, 2009). Contextual factors are driven and led by various stakeholder groups, including government officials, political parties, non-governmental and industrial lobby groups and private company representatives and their corresponding history of relationships (Bucur-Marcu et al., 2009).

Based on the above mentioned objectives and the contextual factors, structure and processes are shaped and exercised through managerial actions and decisions in defence management (Lynn et al., 2000). In terms of structure governance literature typically distinguishes formal and informal structure. While formal elements of structure comprise e.g. organizational structure, written standards and contracts, informal elements of structure contain e.g. norms, values, social behavior and information sharing practices (Pilbeam, Alvarez, & Wilson, 2012). As an example, due to budgetary constraints (exogenous contextual factor), a series of nations started a politically induced (exogenous contextual factor) force transformation process (managerial action) and changed the organizational structure (formal structure) in terms of changing from a conscript based military force to a professional armed force (output) (Snider, 2008).

Considering the process perspective Ratchev (2009) considers "defence management" as a decision-making procedure in which actors in defence management shape the implementation of defence policies together with stakeholders from the political practice and from the operational military sector. Hence, defence management can be seen as the decision-making procedure that answers questions concerning (1) planning and programming, (2) organization and staffing, (3) directing and leading, and (4) monitoring and controlling for each functional topic in the defence management sector (Ratchev, 2009). The wide range of functional topics includes, among other things, the strategic planning of the capability profile of the armed forces, the structure and composition of the civilian and military personnel body, the financial budgeting and spending, acquisition of technical equipment and services, training, infrastructure, logistics and maintenance, response to crises or cooperation in a multinational context (Barber, 2013; Bucur-Marcu et al., 2009).
Considering the actors of defence management their role is to direct and execute measures to achieve the predetermined goals. Similar to decision-making situations in the private or other public sectors, management tools and methods are used to prepare and conduct decisions. These instruments include, for example, project and risk management, data analysis, modeling and simulation, the derivation of action alternatives and scenarios and performance measurement and improvement techniques (Ratchev, 2009). In addition success of projects and large programmes depends on leadership capacities, which include good leadership practices such as innovation and goal setting, employee motivation, recognition and support, problem solving, and delegation of authority or work tasks. It also includes the creation and implementation of performance standards, incentives, and sanctions (Lynn et al., 2000).

In summary, the characteristics of defence management can be pictured as outlined in the figure below. In comparison to the framework provided by Lynn, Heinrich & Hill (2000) the category “functional themes and processes” has been added in an extra category. They are shaped by defence management actors through decisions, structure and overall, generic management processes.

As already indicated above, the issue of ‘defence acquisition’ can be understood as a functional theme in the field of defence management. When examining literature the terms ‘defence acquisition’ and ‘defence procurement’ are often used synonymously. Schmoll (1996) and Brown (2010), suggest, that the term ‘defence acquisition’ refers to the entire process of acquiring (and disposing) weapon systems, IT systems and supporting services. Acquiring weaponry and IT typically includes requirements engineering and involves activities such as design and research and development. The entire acquisition cycle is usually subject to strict regulatory oversight. The term ‘procurement’ however focuses only the pure act of buying or contracting goods and services. In contrast to ‘defence acquisition’, ‘defence procurement’ also encompasses buying goods and services such as passenger vehicles, office supplies and waste removal. Hence, ‘defence procurement’ is seen as only one of the many functions performed as part of the entire defence acquisition cycle. In the context of this working paper we adopt the definition of defence acquisition. It summarizes all activities and decisions that are required for the design, the procurement and the disposal of any kind of military and non-military equipment and service that contribute to the preservation and enhancement of the capabilities of the armed forces (Brown, 2010; Georgiev, 2010; Schmoll,

Figure 2: Defence Management and Governance Framework

Perspective of the Department of Defence of a certain nation

Contextual factors
- Exogenous
  - International Agreements & defence policies.
  - National political structures & monitoring authorities.
  - Performance of economy & budget constraints.
  - Market structure & degree of competition.
  - Available technology & technology dynamism.
  - Threat scenarios.
- Endogenous
  - Own resource situation.
  - Internal relations.
  - Corporate culture.

Stakeholders
- Government officials.
- Political parties.
- Lobby groups.

Structure
- Formal
  - Organization.
  - Standards.
  - Contracts.
- Informal
  - Norms.
  - Values.
  - Behaviour.
  - Info. Sharing.

Functional themes & processes
- Force capability strategy, personnel, financials, acquisition, training, infrastructure, logistics & maintenance, cooperation, etc.

Managerial roles and actions
- Leadership capacities.
- Sanctions.
- Incentives.

Processes (gen.)
- Planning and Programming.
- Organizational mobilization and staffing.
- Directing and Leading.
- Monitoring and Controlling.

Output
- Effective and Efficient implementation of national and international defence policy goals at a set level of ambition.
The overarching aim of acquiring military goods and services is the provision of high quality military and operational capabilities in a timely manner against set objectives (level of ambition) and against the needs of the end user according to economic principles (Lawrence, 2009).

Similar to the defence management activities described above, the acquisition procedure encompasses a decisions-making process composed out of various elements. As well as defence management it is influenced by the same external and internal contextual factors (Georgiev, 2010). Starting with the priorities set in the security and defence policy (Dickow, Linnenkamp, & Mölling, 2012; Eliassen & Sitter, 2002; Hartley, 2003; Ojanen, 2006) and taking other factors into consideration such as financial and budgetary constraints (Ballester, 2013; Marrone, 2012), strategic planning and programming examines what capabilities should be acquired at what time and with what (financial) resources. The aim of this strategic planning is the prioritization of acquisition programs (Georgiev, 2010). In order to meet prioritized requirements as good as possible, the current structure of the armed forces and the current capability profile is assessed together with an overview on available capabilities on the market (Lawrence, 2009). As a result, solutions from different vendors are carefully compared and selected according to predefined criteria including economic decision criteria. After the selection of a provider and the conclusion of the contract the other phases of the acquisition process in terms of design, engineering, test and evaluation, production, inspection, and operation as well as ongoing support for the system in use begin. The process usually ends with the disposal of the military system or with the termination of a service contract (Brown, 2010; Rendon, 2008; Schmoll, 1996). The defence acquisition management process itself is usually highly formalized and described in detail by various defence acquisition doctrines and directives from official defence administration authorities (e.g. US DoD 5000.01, German CPM 2010, nov.).

Due to their technical requirements, due to their enormous consumption of public resources, due to their large number of suppliers coordinated within a program and due to the influence of various interest groups defence acquisition programs are to be considered as very complex (Dillard, 2005). Regularly, time schedules are stretched and budget overruns occur. Therefore, a strict and transparent program and project management is required in defence acquisition management. Instruments such as project management, risk management, monitoring, controlling and performance management are key to the success of acquisition programs (Brown, 2010; Darnis et al., 2007; Dillard, 2005; Kadish et al., 2005). Against the background of increasingly scarce resources for defence acquisition programs different optimization initiatives are discussed in the literature. This includes for example, a consistent performance review of the programs along their entire life cycle. However, detailed performance measurements due to lack of standards and an integrated and consistent coverage of the costs seem difficult to implement (Dillard, 2005; Kadish et al., 2005; Rendon, 2008). Moreover, it is discussed to assess markets for already existing solutions. The discussion encompasses the evaluation of existing commercial and civilian solutions (commercials off the shelf), existing solutions from other authorities (government off-the-shelf) or existing military components, products and services (military off the shelf) (Tagarev, 2009; Lawrence, 2009). In addition, discussed particular in Europe, a stronger and improved cooperation between the participating partners of current and future armament projects is required. Three different forms of cooperation are currently examined. These include a joint and coordinated procurement of required capabilities, the pooling of required maintenance or training capacities for similar systems and platforms, as well as a coordinated specialization of individual nations to pre-defined core skills, which are then further developed by a nation and provided for the partners (Darnis et al., 2007; Marrone & Nones, 2013; Mölling, 2008, 2012; Reynolds, 2013; Valasek, 2011).

In summary, the characteristics of defence acquisition management can be similarly visualized as outlined in the explanations on defence management. In comparison to the framework provided in the defence management section the category “functional themes and processes” has been modified to “functional processes and improvements” as this reflects the defence acquisition perspective in a better way.
Applied Methodology

With the above mentioned considerations on ‘defence management’ and ‘defence acquisition’ in mind, the methodology for this working paper has been selected and developed. The methodology applied in this working paper is following the approach suggested by Pilbeam, Alvarez & Wilson (2012), Cobo et al. (2011), Denyer & Tranfield (2009) and Armitage & Keeble-Allen (2008). Hence, a series of five phases was conducted: (1) Searching, (2) Screening, (3) Extraction, (4) Synthesis and (5) Reporting.

In the first phase, a set of German and English keywords, clustered in three groups was created. The three groups contained terms and synonyms for (A) research organization, (B) defence and (C) acquisition/procurement. These keywords were later used to build search strings, which were applied to a web-based search within the search engine “google”. The search strings were build by connecting single keywords at least from two groups through Boolean AND/OR connectors. In order to retrieve results for research organizations with a focus on defence management in general groups (A) and (B) were combined. In order to specify the search for research organizations with a special focus on defence acquisition the groups (A), (B) and (C) were combined. The search was conducted in English language, as most research organizations provide their web-based content in English. Research organizations not providing English language content were excluded in the review. Appendix A lists the keywords that were used in the web-based search.

In the second phase, screening for relevant results was conducted. Due to the overwhelming number of search results, the screening was limited to the first five result pages. The search results were assessed by titles and available short descriptions provided by google. Relevant entries were transferred to an MS Excel Datasheet, by considering the title of the research organization, the link to the research organization and the date of access to the web-page. However, defence procurement agencies and private consultancy companies were excluded in the review, as the research focus was on entities providing research in applied sciences. The final sample, which can be considered as a preliminary dataset at this point in time, contained 56 defence research organizations. Appendix B lists the organizations in the sample.

In the third phase, content relevant data was collected. The relevant data contained the (self-) description of each research organization in the sample. The data was directly retrieved from the web-pages of the corresponding
research organization, predominately from the navigation section “about us”, “who we are” or “our profile”. This data was extracted and added to the above mentioned MS Excel Database. The extracted descriptions were assessed in two steps. The first step contained a fully automatic search for relevant keywords concerning organizational setup and the two research themes defence management and acquisition in the extracted descriptions. The aim was to filter only for those research organizations that have a dedicated focus on defence management or acquisition topics in general. The second step contained a manual re-assessment in order to assure quality of semantic meanings. This resulted in the reduction of the sample from 56 entries in total to 41 entries dealing with defence management and 17 entries dealing with defence acquisition. In a subsequent step, detailed data on defence management research topics were gathered from publication lists or from webpage sections on closed or running research projects of the corresponding research organization. The identification of those topics was conducted by applying a (co-) word analysis proposed by Callon et al. (1983). It uses the most important words and conceptual keywords to study the structure and dynamics of a research field. The aim is a mapping of the structure of research on defence science, the development of research fields or subfields (Besselaar & Heimeriks, 2006). The different topics were collected in a summative approach (Hsieh & Shannon, 2005). The value of this approach lies in the advantage, that merely all relevant topics can be gathered. The disadvantage is the rising number of topics and growing complexity for evaluation as some topics are named differently but cover the same thematic core. An in-depth analysis of publications, such as briefs, alerts, reports, calliot papers and journal publications has not been conducted to this point in time and is indicated as a limitation in the corresponding section in this working paper.

In the fourth phase, an aggregative and explanatory synthesis was conducted (Denyer & Tranfield, 2009; Rousseau & Manning, 2008). While research topics where collected in a summative approach, and complexity was rising, they were structured and examined with the help of the analytical framework introduced at the beginning of this working paper. The value of this approach lies in the possibility to cluster and aggregate collected research topics according to predefined and generalized categories and to uncover blind spots in defence management and defence acquisition. In this working paper, the synthesis focused on research institutions with a focus on European security and defence management matters only. This selection was made due to shared circumstances in the European union. The authors are well aware, that through this selection the possibility of showing differences in research topics between different geographical locations was eliminated. Hence, the final sample contained 41 research organizations with a focus on defence management and procurement topics. Out of the 41 research organizations 29 organizations were identified with a clear focus on European security and defence matters. The other 12 organizations had a purely national focus or could not be classified accordingly. Out of the 29 organization with a focus on European security and defence matters, 13 research organizations were identified with a focus on defence acquisition.

In the fifth and final phase, the results were translated into this working paper. The aim is to report the intermediate results and to reveal and test methodology and results with a broader audience.

Descriptive analysis of the sample

In this section, the retrieved data is presented to generate first insights on the defence research organizations under investigation. By examining the sample distribution, the authors focused on five specific descriptive parameters: (1) Country of Origin, (2) Funding, (3) Type of organization, and (4) Thematic focus.

In terms of country of origin the sample data shows, that the 29 research organizations with a focus on European Security and Defence are located in 12 different countries. The top 5 countries represented in the sample are Germany (8 organizations / 28% of sample data), United Kingdom (5 organizations / 17% of sample data), United States of America (4 organizations / 14% of sample data), France (3 organizations / 10% of sample data) and Sweden (2 organizations / 7% of sample data). In total, these countries represent more than 75% of the selected population. A reason for the high share of Germany and UK based research organizations in the sample was the use of German and English keywords. During the data collection process it became apparent, that the majority of webpages were provided in several languages. For some research organizations located in Spain or in France that did not apply. This led to an exclusion of those research organizations from the sample. When comparing these results to the European countries with the highest defence budgets, namely UK, France, Germany, Italy and Spain (Benari, Sanders, & Lombardo, 2011) one can state, that research institutions from most important countries are included. Moreover it is not surprising, that research organizations in the United Kingdom and in the United States of America are examining European Security and Defence topics as well. This is most probably due to close
relations and cooperation within NATO and a natural interest of UK and the US in European developments, especially in terms of a higher demand for operational responsibility in robust missions and operations.

Figure 4: Distribution of research organizations across country of origin

In terms of funding and type of organization, one can observe that 14 research organizations were predominantly funded by public authorities, 8 were funded through private initiatives and 7 are funded through a hybrid approach, combining public and private financial resources. Most of the publicly funded research organizations are Universities or Institutes, which are sometimes founded by a combined university effort. It can also be observed, that security and defence research is not only a matter of public entities. More than 50% are funded by private initiatives or in a combined, hybrid approach. Most of these research organizations name themselves Think-tanks or Centers and are organized as foundations or associations with different lobby groups acting in the background. It has to be acknowledged, that a plethora of different names for organizations were used in the self-provided descriptions of the corresponding research entities. It has not always been clear how to classify certain research entities, as they sometimes used a combination of different terms for describing the type of organization.

<table>
<thead>
<tr>
<th>Type of research organization</th>
<th>Public</th>
<th>Private</th>
<th>Hybrid</th>
<th>SUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institute</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>University</td>
<td>7</td>
<td>0</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Think-tank</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Association</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Foundation</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Center</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td><strong>SUM</strong></td>
<td><strong>14</strong></td>
<td><strong>8</strong></td>
<td><strong>7</strong></td>
<td><strong>29</strong></td>
</tr>
</tbody>
</table>

Table 1: Distribution of research organizations according to their funding

In terms of examining the thematic focus of the research organizations the selected sample contained only those research entities with a clear focus on defence management. Of those 29 entries containing a defence management specific focus, only 13 focused on its sub-theme defence procurement. When examining the research entities with a specific focus on defence procurement according to their funding and organizational type, one can recognize that there seems to be a split in the research landscape. On the one hand, there seems to be a clear interest of public authorities to further investigate defence procurement challenges. On the other hand there seems to be almost equal importance on the privately organized side. Interestingly there is little to no combined effort on defence procurement research.

<table>
<thead>
<tr>
<th>Type of research organization</th>
<th>Public</th>
<th>Private</th>
<th>Hybrid</th>
<th>SUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>University</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>
Table 2: Distribution of research organizations according to their funding with a specific focus on defence procurement research entities

<table>
<thead>
<tr>
<th>Type of research organization</th>
<th>Public</th>
<th>Private</th>
<th>Hybrid</th>
<th>SUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Think-tank</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Institute</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Center</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Foundation</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>SUM</td>
<td>8</td>
<td>5</td>
<td>0</td>
<td>13</td>
</tr>
</tbody>
</table>

When considering the entire sample (n=29) one has to clearly state, that subsequent conclusions have to be treated as indicative statements at this point in time. The size of the sample is a clear limitation and needs to be expanded at later point in time. Also there is a notable bias towards German, UK and US based research organizations. A detailed overview on research organizations and descriptive data can be found in Appendix B.

Findings and Discussion according to the research questions and to the framework

The subsequent section is divided into two parts. The first part describes the results and findings from the summative collection of key research areas. The value of this analysis lies in the mapping of the themes covered in the examined research organizations. The second part deals with a generalization and aggregation of the findings by employing the analytical framework described above. The value of this approach lies in the condensed perspective which should help to quickly identify thematic areas covered or areas in which more research can be conducted in the future.

The summative approach led to the collection of 29 different themes within the research field defence management. The themes were identified through an iterative approach applying manual and fully automatic checks (formula based on text search was developed and utilized). This approach included the manual and summative collection of keywords extracted from the (self-)descriptions from the first 5 research organizations collected in the MS Excel database. In a second iteration a fully automatic check for these initial keywords was applied to the remaining research organizations in the database. In a final step a manual quality check was applied in order to correct semantic errors. This three step iteration cycle was repeated, as through reading and analysis additional themes were identified and extracted to the list. The value of this approach lies in its ability to detect keywords in text which has not been subject to coding yet. This is especially helpful when conducting a summative approach in which keywords can be added to the analysis and hence require recoding of already read passages. Apart from utilizing the (self-)descriptions, also a brief assessment of research themes, research projects in progress and closed projects was conducted. For this assessment, project lists and the web-page section 'research', 'research themes' or 'our focus' were checked for relevant key topics. As will be mentioned in the section on limitations, a in-depth assessment of alerts, briefs, chailiot papers and other publications has not been performed to this point in time.

By sorting the results in the sample by number of topics covered, one can observe, that only a few research organizations cover a broad spectrum of defence management research themes. The top six research organizations with respect to number of covered topics are the Stockholm International Peace Research Institute (SIPRI) with 17 out of 29 topics covered, the Center for Security Studies located in Switzerland (CSS) with 15 out of 29, the International Institute for Strategic Studies (IISS) located in UK with 14 out of 29, the RAND International Security and Defence Policy Center (ISDP) located in the US with covering 12 out of 29, the Royal United Services Institute (RUSI) based in UK with 9 out of 29 and finally the German Institute for International and Security (SWP) located in Germany with 9 out of 29 topics covered. It is not necessarily said, that research organizations that are covering only a small array of topics are less important to the defence science community. Anyhow, in the current absence of an impact factor on defence research organizations at this point in time it is assumed, that those organizations are specialized research branches.

The 29 different topics contained in the sample, covered a broad spectrum of defence management themes. Topics range from Security and Defence Policy challenges to Defence Spending, Cyber defence, Terrorism, Piracy, etc. By sorting the collected topics according to number of research organizations covering the theme, it becomes apparent, that the majority of the examined research entities is focusing on similar key topics. By far the most treated topic is
the subject of Security and Defence Policy challenges. 22 out of 29 research organizations are covering this research field. As already hinted in the above mentioned analytical framework, this is one key contextual factor to an effective and efficient defence management system. Not surprising is the fact, that defence procurement seems to be a topic which is also covered widely by applied science research. 13 out of 29 research organizations are covering this research field. This topic, especially in austere times is closely connected to the discussion of Security and Defence Policy challenges. The exact focus of the underlying research has to be examined in the analytical part on defence procurement themes. Other topics widely covered are elaborations on weaponry and technology, mostly covered from either a capabilities perspective and/or a technical lense, defence economics which mostly embrace the study of wars and conflicts both conventional and non-conventional conflict, examples include the economic study of civil wars, revolutions and terrorism which is according to Hartely a relatively new science field (Hartley, 2007), conflict management and peace operations, cooperation, and many more. Equally interesting are the topics which have received little coverage. These included Arms trade, Security Sector Reform, Piracy and many more.

Figure 5: Number of topics covered by research organization
A detailed list on defence research organizations and corresponding themes on defence management can be found in Appendix C.

For defence acquisition 13 different themes were collected. The collection process followed the exact same procedure described in the section on defence management findings.

By sorting the results in the sample by number of topics covered, one can observe that 4 research organizations cover almost the entire spectrum of identified defence acquisition research themes. The top 4 research organizations with respect to number of covered topics are the RAND International Security and Defence Policy Center (ISDP) located in the US with covering 13 out of 13 topics, the Center for Civil-Military Relations at the Naval Postgraduate School located in the US, with its IDARM branch which focuses on activities that are designed to strengthen defence acquisition processes and decision making and on helping nations to understand and adopt business practices, the Center for Defence Acquisition (CfDA) located in the UK and focusing on research and education across the range of specialist subjects in acquisition and the Center for Strategic and International Studies (CSIS) located in the US focusing on understanding challenges for the global defence industrial base and those related to defence reform from an acquisition point of view. What is interesting, is that among the top 4 research organizations examined in the sample, only one is located in Europe. There seems to be a center of gravity of research on defence defence acquisition in the US. This seems logical as the US is the number one country for consuming defence related products and services. Even though these institutes examine European defence acquisition challenges, they often bring in a transatlantic perspective. This is interesting, as it opens up room for comparison and corresponding potential improvements.

The 13 different topics contained in the sample, covered a variety of defence acquisition themes. Topics range from Security and Defence Policy challenges with a special attention to procurement implications, to armaments acquisition cooperation, defence spending, required defence and mission critical capabilities, to the setup of defence markets, the degree of competition and regulations, to steering huge defence equipement programmes. Less studied fields can be observed with procurement strategy, procurement organization, procurement processes and surprisingly with private sector participation. An explanation for this observation could be, that public private partnerships have been discussed already in detail and hence is not a ‘hot topic’ as such.
A detailed list on defence research organizations and corresponding themes on defence acquisition is listed in Appendix D.

By applying the proposed analytical framework for defence acquisition to the results mentioned above, the authors intend to depict thematic priorities in current defence acquisition research and to reveal less covered topics. The result is a condensed map which can be used as a starting point for further research. In order to generalize the findings, the topics identified through the search process were mapped to the general framework. The mapping process was done in several steps. Firstly, the themes in defence acquisition management were matched with the broader categories of the proposed framework. For example, the topic ‘defence capabilities’ was matched to the framework category “output” or the topic ‘Defence & Security Policy’ was mapped to the framework category ‘exogenous contextual factors’. Secondly, as already mentioned above, ‘defence management’ and ‘defence acquisition management’ share the same contextual factors, shared themes from ‘defence management’ were also included in the defence acquisition management map. The first two steps lead to a preliminary map that answered the question if parts of the framework are covered through the work of the research organizations in the sample or if there are areas not covered. This mapping followed a binary approach. The results are pictured in the figure below. A detailed list on the mapping can be accessed in Appendix F.
When examining the map provided above, one can observe, that a series of topics seems to be covered by the research organizations. Covered topics seem to lie in the description of exogenous contextual factors, in formalized structures, in overall processes and in functional processes and in the description on how to effectively and efficiently procure defence equipment against a set of levels of ambitions. Topics, which were not identified in the conducted research contain a more detailed description of endogenous contextual factors, a description of the influence of different stakeholder groups, informal structures and managerial roles and actions.

In a third and final step, the number of research organizations was added to the chart. A representation of this examination can be seen in the figure below. This step was meant to indicate focus areas of research. It has to be mentioned, that indicated numbers of research organizations contain duplicates, as defence acquisition management is a subtopic of defence management. In certain areas however, they share some research findings, as can be seen in the area of exogenous contextual factors that influence managerial activities in defence acquisition. While one can observe that some topics are less covered, the general findings mentioned above do not substantially change. The only ‘difference’ can be observed, when examining the endogenous contextual factors. While there was no observation in defence acquisition research for the topics ‘available technology’ and ‘threat scenarios’, both topics were well covered in defence management research. When focusing on number or research organizations in the field ‘defence acquisition’ three rather better treated areas can be identified. These areas were ‘exogenous contextual factors’, ‘functional processes and improvements’ and ‘output’ of acquisition management. Less covered areas considering this perspective were ‘stakeholder influence’, ‘managerial roles and actions' and ‘informal structures’ (similar to the findings in the binary approach indicated above).
to compare the initial classification with an external point of view. Hence, as a result, it would be possible to conduct an empirical investigation through a structured questionnaire with closed questions to help categorize research fields. The questionnaire could be sent to the already identified research organizations. This is due to the fact, that there is no common standard or no common description for similar fields of study. In a way each research organization and research project tries to distinguish itself from one another in order to claim a unique research proposition in their respective field. The selected method contains room for bias, as it allows for subjective judgments from the authors. Subjective bias can be observed in selecting the topics identified in the search process and not covered by research organizations. As any qualitative review and content analysis, the selected method contains room for interpretation of studied areas in defence management and in defence procurement. This is due to the fact, that there is room for interpretation of the marketing capabilities of research organizations and to maintain the field's expansion. Exogenous factors could be considered in both phases of the defence management and procurement cycle such as political parties, government officials, lobby groups and international agreements. Endogenous factors such as corporate culture, production, inspection, operation, support, disposal of the military system or termination of service contract. Stakeholders such as government officials, political parties, and lobby groups could be considered in both phases of the defence management and procurement cycle. Figure 10: Mapping findings from defence management and defence acquisition (preliminary results) All these preliminary conclusions shown above need to be treated with utmost caution at this point in time. As mentioned in the limitations section results need to be safeguarded and enriched with further information pieces. Limitations At this point in time the authors are well aware of the limitations of this work in progress paper. Elaborations on limitations can be structured into four main topics, basically following the storyline of this working paper: (1) Framework, (2) Methodology, (3) Sample and (4) Findings.

In terms of framework, the reduced-model proposed by Lynn, Heinrich & Hill (2000) is used and gradually complemented with insights from the defence management and defence procurement practice. It is based upon principals derived from public management and governance theory. While these insights from theory are providing some guidance other theories need to be assessed and evaluated to further expand and detail the framework. Valuable insights could be drawn from classical economic theories that are closely connected to governance theory discussions. Examples would be transaction cost economics (Williamson, 1999, 2002), dynamic capabilities view (Ambrosini & Bowman, 2009) or from strategic choice theory (Child, 1972, 1997). They could help to understand relations and impacts between the single elements of the framework provided. Hence, a more insightful analysis could be conducted on what is already under investigation or on what is a neglected area of research organizations.

In terms of methodology, the authors selected a structured and logical approach following good practice as suggested by several other sources (Armitage & Keeble-allen, 2008; Denyer & Tranfield, 2009; Glock & Broens, 2013; Pilbeam et al., 2012). As any qualitative review and content analysis, the selected method contains room for bias, as it allows for subjective judgments from the authors. Subjective bias can be observed in selecting the research organizations for the sample. Due to the overwhelming number of search results, the screening was limited to the first five result pages. An expanded view could help to broaden the sample. It continues with the interpretation of studied areas in defence management and in defence procurement. This is due to the fact, that there is common standard or no common description for similar fields of study. In a way each research organization and each research project tries to distinguish itself from one another in order to claim a unique research proposition in defence management and procurement science. One possible improvement would be to conduct an empirical investigation through a structured questionnaire with closed questions to help categorize research fields. The questionnaire could be sent to the already identified research organizations. Hence, as a result, it would be possible to compare the initial classification with an external point of view.
In terms of content data collection, the authors were choosing a web-based analysis. It needs to be addressed, that even though the data collection process was made transparent, repeatability of the search cannot be guaranteed. This is due to the fact, that web-based content is subject to continuous changes and updates. Following the recommendations on evidence based research (Rousseau & Manning, 2008) the authors collected content data in a MS Excel Spreadsheet in order to make steps in the analysis transparent. Moreover, the geographical distribution of the data examined is limited on research organizations with a focus on European security and defence matters. The scope might be improved with widening the sample also onto other regional areas, such as American, African and Asian. The value would lie in the possibility to uncover differences in research agendas and topics in defence and procurement management. Another vital improvement would be to examine the impact of the research organizations on the development of defence science and on public policy authorities.

In terms of findings, as this is a work in progress paper, an in-depth analysis of publications, such as briefs, alerts, reports and challiot papers typically provided on the various research organizations homepages has not been conducted at this point in time. It is no doubt, that this would enhance findings on research organizations and their field of study. Second, the analysis considered only content, which is shared by the regarded research organizations on their homepages. Most sources are comparable in their structure and degree of provided information, but there are some information gaps. Therefore, this work-in-progress research could safeguard its findings by using additional sources, such as journal publications of research organizations staff members. Moreover, it is also vital to compare findings on thematic priorities from this working paper with journal publications in respected and ranked journal posts. This will help to draw a more thorough judgement on research priorities.

Conclusion

This working paper provides two key contributions. First, to the knowledge of the authors, this working paper represents one of the very first overviews on applied science research on defence management and defence procurement. The objective was to uncover research organizations in the field of defence science and to map them according to the topic they cover. In summary a sample of n=29 research organizations was examined. In summary defence management is a very broad (sometimes) not very well structured field of research. It encompasses a wide variety of research topics, among them “defence procurement”. It seems that defence procurement has a strong rootedness in applied science research. However, preliminary findings indicate, that certain topics are handled less frequently, such as a more detailed description of endogenous contextual factors, a description of the influence of different stakeholder groups, informal structures and managerial roles and actions and the interactions among them. Further, empirical research as suggested in the limitations section is required to safeguard these findings.

Being aware of its limitations, suggested improvements, such as the proposed empirical research are expected to improve the quality of the findings and conclusions. Anyhow, the preliminary results outlined above can help researchers and practitioners to gain a quick and condensed overview on the research landscape of defence management and defence procurement. It further provides details on covered topics and can thus be utilized to identify experts for discussions, group panels or Delphi-studies. As research and publications in ranked journals on defence management and defence procurement in particular are limited, this research also provides an idea on how to obtain research content and material despite the gap in ranked journals. A targeted assessment of alerts, briefs, reports and challiot papers can be conducted based on the information provided in this working paper.

The second contribution examines the variety of themes researched through the provision an analytical framework, based on insights from public management and governance theory. The framework helped to reduce complexity stemming from the great variety of collected research topics and helped to generalize findings. This framework can be used as a starting point and can be expanded through additional research.
References


Hübner, F. (1823). Militär-Ökonomie-System der kaiserlich königlichen österreichischen Armee, Wien, 1823 (also accessible via the internet: http://books.google.de/books?hl=de&lr=&id=r57TAAAACAAJ&oi=fnd&pg=PA1&dq=milit%C3%A4r%C3%B6konomie&ots=Wx5viaeZNU&sig=x_YoHGqsbV8lrxHyzfYZ-faVRW4#v=onepage&q=&f=false.


Appendix A: Search strings used to identify defense research organizations

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<th>Group B – Defence (AND/OR)</th>
<th>Group C – Procurement (AND/OR)</th>
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<td>Acquisition (Rüstung)</td>
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<td>Crisis (Krise)</td>
<td>Procurement (Beschaffung)</td>
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<td>Purchasing (Einkauf)</td>
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<td>Supply (Versorgung)</td>
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</tr>
<tr>
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<td>Peace (Frieden)</td>
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<td>Security (Sicherheit)</td>
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<td>(Working) Group (Arbeitsgruppe)</td>
<td>Strategic (Strategie/strategisch)</td>
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Appendix B: List of identified and reviewed organizations in defence management research.

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<th>Last access date</th>
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## Appendix C: Sample (n=29) and descriptive data / classification.

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Appendix E: Research organizations and defence procurement topics.

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## Appendix F: Mapping of research topics and framework categories (for defence acquisition research map).

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### Defence Management (if shared with defence acquisition framework)

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CONTRACT MANAGEMENT AND PERFORMANCE OF ROAD MAINTENANCE PROJECTS IN ARUA MUNICIPALITY

Godfrey Aluonzi¹, Pross N. Oluka² and Alex Nduhura³

ABSTRACT

This purpose of this study was to establish the relationship between contract management and performance of road maintenance projects in Arua Municipality. A cross-sectional survey design was used, with data collected from a sample of 102 respondents using questionnaire survey and interviews. The study found a significant relationship between contract administration, relationship management and contract closure and performance of the maintenance projects. We conclude that improved payment mechanism, controlled contract variations, improved communication channels and disputes management improve projects performance. The study recommends that the government of Uganda should increase the budget for road works; internal audit function be strengthened, contract management meetings regularly held and contract specifications clearly articulated and adhered to; and technical staff should be trained in contract management and stringent performance measures provided as controls to adequately punish errant officials. These findings offer a useful foundation in the road sector for policy and practical improvement in Uganda.

Key words: Contract management, performance, roads works, project, road maintenance, municipality, Arua, Uganda, service delivery

1.1 Introduction

Kylindri, Blanas, Henriksen & Stoyan (2012) contend that the main goal of each project is to be successful. Contract management in government has received increasing interest since the late 1980s, fostered by the ‘re-inventing government’ movement (Osbourne and Gaebler, 1992). This movement was part of the New Public Management (NPM) that saw numerous public sector reforms, a wave of decentralization endeavors and the injection of an entrepreneurial spirit in the running of government. Managers were given much autonomy to manage, accompanied by strong measures of performance. It was, however, not until 1989 that contracting-out was formally identified as a business strategy (Rundquist, 2007; Piore and Sabel, 1990) in an effort to transfer some risks to other parties, thereby targeting better performance. Gwilliam et al., (2008) estimate average spending on roads in Africa at nearly 2% of Gross Domestic Product (GDP); the estimated expenditure in the industrialized countries is only about 1% of GDP while expenditure on roads in the fast growing economies ranges between 2% and 3% of GDP. The roads

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sectors in Uganda, like many other sectors, have since the 1990s undergone several reforms aimed at improving efficiency and effectiveness.

Despite these reforms and increases in funds allocated to the road sector in the national budget, service delivery indicators remain below target levels. The proportion of paved roads increased from four percent in 2005 to eight percent at the beginning of 2009, with 45 percent of all the roads being in poor condition. According to the World Bank (2011), the maintenance and development funding for the national road network amounted to an average equivalent to about US$100 million per annum. However, Government is concerned that 70% of the contractors do shoddy work (Works Minister Abraham Byandala, 2013; Ntayi et al., 2010) contractors constantly fail to deliver even after receiving advance payments. Furthermore, despite the existence of a regulatory framework in the public sector, millions of dollars have been lost in unfulfilled contracts. Existing evidence indicates that the government is still losing billions of shillings in shoddy works and services Inspector General of Government (IGG Report, 2012). We, therefore, hypothesized that this could be due to poor contract management among key players in the procurement process. Could the above background have led Basheka and Kabeteraine (2013) to conclude that the public procurement reforms envisaged may have been lost in practice?

According to the Works and Transport Sector Performance Report (2011), availability of good-quality and reliable transport infrastructure and services is a pre-requisite for effective functioning of the service sectors, consuming about 16% of the national budget. Biafore (2006) observes the importance of contract management in projects performance. She notes that learning to avoid past mistakes is an important part of improving project performance. Cantabria (2011) records the use of ‘rule of thumb’ during the early years of industrialization as a measure (rough estimate) of things. The writer further reports the introduction of scientific management by Taylor in the early 1900s, which signaled the evolution of performance cost measurement. As industrialization entered the 20th century, Taylor mainly focused on productivity (efficiency) of the labor force that comprised mostly unskilled immigrants or field workers. It took about a century before the methods for evaluating performance took shape and form as a business management discipline. Memon, Rahman and Azis (2012) found that the construction industry in Malaysia, still faces poor performance, resulting in failure to achieve effective time and cost performance. Martin (2012) identified four key factors impeding the organization’s ability to deliver projects successfully as technical complexity of a project, optimistic organizational culture, unstable funding.

2.0 Statement of the Problem

When the Road Fund Act (2008) was operationalized in 2010, road maintenance funding to the Municipality rose significantly during financial year 2010/2011 (Annual road maintenance plan, 2010). Despite the achievements made in road maintenance performance during the study period, many road links in Uganda are not motor-able due to improper contract management. Nearly 40% of Arua Municipality’s road network remains either poorly maintained or unmaintained and riddled with potholes. An audit by Uganda Road Fund in 2013, of the Municipality found that there were no records, site handovers, and completion certificates final handover of completed projects. If road funds are not adequately managed, the Government of Uganda is likely to continue losing colossal amounts of money in the road sector without an equivalent level of actual service delivery. Sabiti, Muhumuza and Tumutegeyereize (2013) confirm that only 29.4 % of contracts are completed within the original contract time.
This indicates that contract management is a probable area of poor performance. It is therefore against this background that the researcher studied the relationship between contract management and performance of road maintenance projects in Arua Municipality. Conceptually, contract management has become a megatrend in many public entities especially as result of social accountability and increased demand of service delivery (Shetterly et al., 2012; Schiele, 2007; Swinney and Netessin, 2007). Contract management has been described by Rendon (2009) as having agrip in project monitoring and control.

3.0 Theoretical background

Khosravi and Afshari (2011) assert that researchers still have no common dimensions constituting project performance and how it should be measured. Lim and Mohamed (1999) argued that that project success depends on whether one is an individual owner, developer, contractor, user, and the general public and so on. Chan and Chan (2004) categorized performance indicators for construction project performance into two categories. Category one composed of time; cost; safety; and environment. The second one was subjective measures, which comprised quality; functionality; and satisfaction of different project participants. However, other researchers criticized Chan and Chan (1997) as being limiting to operational and tactical levels and excluded the strategic level of the project. In the same breath Ahadzie et al. (2008) introduced new criteria for mass house building projects, which included: environmental-impact; customer's satisfaction; quality and overall cost; and time. While Bryde and Robinson (2005) argued that contractors measure project performance on five sets criteria, including: cost; time; meeting the technical specification; and customers' and stakeholders' satisfaction. Recent studies by Le-Hoai, Lee and Nguyen (2013) in Vietnam also identified six significant variables of project success as project time, accuracy and completeness of design and owner’s project financing. Xiao and Proverbs (2002); Thai (2004); Lysons and Farrington (2006) assert that contract management focuses on achievement of the three goals of product quality, delivery on time and within the budget. For the purpose of this study we operationalized project performance as quality, cost and time even though they are referred to as the traditional indicators.

We are aware as suggested by Kylindri et al., (2012) that project success may not be assessed only through the three criteria, since ascertaining success is more complex because of the number of stakeholders involved. He argues that success criteria vary from project to project and from stakeholder. PMBOK (2004); Elsey (2007) classifies contract management into upstream/pre-award activities and downstream/post-award activities. We concentrated the study on downstream activities, with emphasis on contract administration, relationship management and contract closure.

Another theory used was the agent theory as advocated by Donahue (1989) who explains that contract managers in public sector play a relationship role. His findings emphasize that the buyer, as the principal, should minimize the risks posed by the agent. Therefore, civil servants concerned with public procurement must play the agent role. In that regard, procurement managers take on the role of agent for elected representatives. The principal-agency theory holds that shirking is likely to occur when there is some disagreement between policy makers and the bureaucracy.
4.0 Literature Review and hypotheses:

A few studies have been undertaken to explain how contract management affects project success mostly in the developed countries but few are context specific to Uganda. Reviewed literature seems to indicate that contract administration, relationship management, contract closure indeed have respective relationships with project performance (Alinaitwe, 2007; Soliman, 2011 and Young 2008). However, not much is known in the roads maintenance in Arua Municipality, Uganda.

4.1 Contract administration and performance of road maintenance projects

Kelman (1994) defines contract administration as a set of activities performed by government officials (client’s representatives) after a contract has been awarded to determine how well the government (client) and the contractor perform to meet the requirements of the contract. While strategizing to ensure that contract management successfully takes the right course, all the parties involved must pay keen attention to all provisions in the given or existing contract (Sanders, Locke, Moore, & Autry, 2007; Laratta (2009) and Saunders (2000) as cited by Oluka and Basheka, 2013). Successful and efficient contract management practices are those that meet the needs of the company’s (client’s) stakeholders, achieve optimum conditions and value in regard to the allocation of scarce tax payers resources, ensure rational and efficient use of funds available, stimulate valuable competition and manage the risk and potential liabilities to the buyer thereby improving service delivery. Thus enforcement of existing regulatory measures must be enforced to avoid pitfalls of inefficient contract management process and eventual poor service delivery (project performance). The people in charge of the contracts need to play an important role in ensuring that the client’s contractual goals are fully achieved at the minimum cost, timely to specifications. Therefore, consideration should be given to address the questions in the procurement contract literature as to how the supplier can provide the buyer with sufficient flexibility while not assuming all the risk due to demand uncertainty (Oluka and Basheka, 2013).

Alinaitwe (2007) links poor performance of construction projects in Uganda to lack of regular payments and meetings between client and contractor hence, contributing highly to substandard projects and variation. Ssebanakitta (2013) on his part blames lack of capacity by the domestic construction industry; overwhelming stakeholder/public expectations; delayed approvals by statutory agencies; uncoordinated and repetitive audits by the various government agencies. All of these distract the sector’s focus on contract administration activities as most staff spend time attending to audit queries. He further states that stakeholder must appreciate that variations in civil works are more of the norm than the exception. The situation is exacerbated by lack of accredited procedures to address road sector specific issues. The arguments above should not lead one to think that it is the client is to blame (Majid and McCaffer, 1998). We thus hypothesize that:

\[ H_1 \text{ Contract administration leads to success in road project performance} \]

4.2 Relationship management and project performance

A study by Coltman, Devinney and Midgley (2009) that examined the impact of customer relationship management (CRM) on firm performance reveals a positive and significant path between a superior CRM capability and firm
performance. This study shows that CRM initiatives that jointly emphasize customer intimacy, cost reduction and analytic intelligence outperform those that take a less balanced approach. Soliman (2011) also finds a positive relationship between CRM and performance. Smith et al. (2004) are concerned that the financial risk and reason for dispute and arbitration mainly arises from the shortage of necessary capital, often resulting in delayed payments by clients to contractors as well as delayed payments by contractors to sub-contractors or contractors’ employees. The writer further indicates that possibilities for disputes, arbitrations and other risks arising from time, cost and quality slippage are largely a result of or poor relationships between the client and the contractor. Oluka & Basheka (2013); Davison & Sebastian (2011) argue that contract management challenges are inevitable in any contractual relationship due to lack of transparency and poor record keeping. Stefanie et al. (2010) & Ntayi et al. (2010c) argue that contracts can provide the scaffold for the economic exchange, as long as the terms of the relationship is clear in terms of what is to be provided and the rights and obligations of parties to the contract thus minimizing the potential for opportunistic behavior.

William (2006) argues that purchasing has the ultimate responsibility of establishing and maintaining good supplier relationships. The author further contends that the type of relationship is often associated with the length of a contract between buyers and sellers. Keeping good relations with suppliers is becoming increasingly recognized as an important factor in maintaining a competitive edge - with many companies often adopting their suppliers as partners, especially in instances where the suppliers are reliable, provide high quality goods, (including works and services), maintain precise delivery schedules and are flexible in cases of alterations to specifications. Elsey (2007) also argues that once the contractor gains greater understanding of the organization’s business needs and style, confidence and trust accrue. We therefore propose the second hypothesis:

\[ H_2 \text{ Relationship management enhances project performance} \]

### 4.3 Contract closure and project performance

Contract closure concerns the activities associated with closing the project down, whether in accordance with the contract or as a result of early termination (Elsey, 2007). Lee (1996); Thai (2004) guides that in cases where arbitration does not work and termination becomes inevitable, the consequences of termination must be taken into account and appropriate provisions made prior to contract signing. Young (2008), in a study on health services in United Kingdom, finds that contract termination occur mainly due to contractor’s inability to perform the work to the required outcomes due to under pricing or misunderstanding the specifications. Non-inclusion of all transaction costs was also noted to have affected efficiency. We then draw the third hypothesis:

\[ H_3 \text{ contract closure clause leads project performance} \]

### 5.0. Methodology

The study adopted the cross-sectional research design and adopted both qualitative and quantitative approaches. Data were collected from the 102 respondents who were selected using both purposive and simple random technique. The sample categories included the top management comprising the mayor and town clerk, members of technical planning committee, municipal
councilors, staff members from works and technical services department, staff members from finance, planning and internal audit department; staff members from the procurement and disposal unit, road contractors and local council 1 chairpersons. The researchers used the self administered questionnaire for collecting data from members of technical planning committee (TPC), municipal executive committee (MEC), other councilors and staff from related departments and road contractors, while the mayor and Town Clerk were interviewed. The responses to the statements in the questionnaire were hinged on a 5-point Likert scale ranging from 5 - strongly agree; 4 - agree; 3 - neutral, 2 - disagree; and 1 - strongly disagree. This is consistent with Likert Scales as laid out by Amin (2005). The instruments’ volatility was evaluated by two experts from Uganda National Roads Authority (UNRA) who evaluated the relevance of each question with regard to the study objectives. The judges then rated each item on a scale of very relevant, VR (2) and not relevant, NR (1). CVI was obtained as 0.97. Basing on Amin (2005), the instrument was considered valid since its CVI was greater than 0.7. Reliability of the instrument was determined to be 0.759 using Cronbach’s Alpha. According to Cronbach (1951), a co-efficient of 0.5 and above is considered adequate. All co-efficient of the variables were above 0.5, implying that the measures were adequate. The overall response rate for the study was therefore 88.2%. According to Amin (ibid), a response rate of 70% is a good representation of the survey population.

6.0 PRESENTATION OF FINDINGS & DISCUSSIONS

In this section, we present the findings of our study. Data was analyzed using the SPSS software. Correlation Analysis was used to establish the strength and direction of the relationship between the variables in the study. Regression Analysis was used to examine the variance in project performance (dependent variable) that is explained by the contract management variables of contract administration, relationship management and contract closure (independent variables). We used the hierarchical regression analysis to determine the impact of each independent variable on contract performance.

6.1 Contract Administration and performance

Table 1: Regression results on contract administration and performance

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>Change Statistics</th>
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<tr>
<td>1</td>
<td>.679a</td>
<td>.461</td>
<td>.455</td>
<td>.49977</td>
<td>.461</td>
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<tr>
<td></td>
<td>a. Predictors: (Constant), Contract administration</td>
<td>b. Dependent Variable: Performance of the projects</td>
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</table>

Table 1 above shows that contract administration was a stronger predictor of coefficient \( r = 0.679 \) was high and \( p \) value \( (p=0.000) \) was less than the \( p \) critical \( (p_c=0.050) \), suggesting a positive relationship between the two variables. From regression analysis, the amount by which a change in contract administration brings a change in road maintenance projects performance was found to \( R^2 = 0.455 \). This means that contract administration affects performance of
road maintenance projects by 45.5%, thus supporting the hypothesis (see appendix).

According to Oluka & Basheka (2013); Rendon (2009) Mansfield, Ugwu and Doran (1994), the problem of untimely financing and delayed payment for completed works, poor contract administration, change in site conditions and shortages of materials cause delays and cost overruns in public highways and building projects in Nigeria. Alinaitwe (2007), whose study was in the construction sector in Uganda, also links poor performance of projects to poor contract administration, emphasizing delayed payments, lack of regular meetings between client and contractor as causes of client’s failure to track project developments and subsequently substandard projects and variation of prices. These arguments are largely in agreement with the findings of this study. Chan and Kumaraswamy (1997) identify some common and significant factors affecting performance of both building and civil engineering projects as poor site management and supervision, low speed of decision making involving project teams, variations of works and inadequate contractor experience. The factors pointed out by these writers are aspects of contract administration, thus in agreement with the findings of this study. Xiao and Proverbs (2002) argue that improved contractor performance leads to enhanced client satisfaction, and hence an improvement in the contractor’s reputation and competitiveness in the market. Therefore Arua Municipal Council’s management should budget basing on realistic requirements of the works and actual funding projections so as to avoid delays in projects and subsequently avoid cases of variations to contracts in the Municipality.

6.2 Relationship management and performance of road maintenance projects

Table 2: Regression results on relationship management and performance

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>Change Statistics</th>
<th>Sig. F Change</th>
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</thead>
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<tr>
<td>1</td>
<td>.744*</td>
<td>.553</td>
<td>.548</td>
<td>.45488</td>
<td>104.10</td>
<td>.000</td>
</tr>
</tbody>
</table>

Table 2 above indicated the correlation between relationship management and performance of road maintenance projects was positive and significant since Pearson’s Correlation coefficient $r = 0.744$ was high and p value ($p=0.000$) was less than the p critical ($p_c=0.050$), suggesting a high positive relationship between the two variables. From regression analysis, the amount by which a change in relationship management brings a change in road maintenance projects performance was found to be 0.548 (R square=0.548). This means that relationship management affects performance of road maintenance projects by 54.8%. The results supported the hypothesis 3 above. A study by Coltman, et al. (2009) reveals a positive and significant path between a superior customer relationship management (CRM) capability and firm performance, showing that CRM initiatives that jointly emphasize customer intimacy, cost reduction and analytic intelligence outperform those that take a less balanced approach.
Soliman (2011) also found a positive relationship between CRM and performance. William (2006) argues that purchasing has the ultimate responsibility of establishing and maintaining good supplier relationships. He further argues that keeping good relations with suppliers is becoming increasingly recognized as an important factor in maintaining a competitive edge—many companies often adopting their reliable and competent suppliers as partners. Elsey (2007) argues that it is necessary for a contractor to gain a greater understanding of the organisation’s business needs so as to develop some level of confidence and trust. But we maintain that parties should establish a precondition of goodwill trust based on the principle of fairness (i.e., the absence of opportunistic behavior). The trust should be built and not demanded from either party. Trust can emerge from an affective experience with the other person (based on underlying feelings) while for cognition-based trust, confidence is grounded in an individual's track record and reputation for dependability, reliability, and professionalism (Katsikeas, Skarmeas, & Bello, 2008). Therefore role expectations and professional norms in contract management should circumscribe the domains within which people's words, actions, and decisions, can be provisionally trusted. Acharya and Young (2006) also argue that claims, disputes and omissions adversely affect the performance. Findings by these writers broadly emphasize the relationship between the contracting parties and their performance in the various projects. The Municipal management should therefore institute clear communication channels with contractors and put in place competent structures that can deal with disputes at their infancy. Internal audit and other over-site departments of the municipality should be strengthened to monitor contract progress closely. Regular contract management meetings involving all stakeholders should also be instituted to make close follow ups on specific observations and recommendations.

6.3 contract closure and performance of road maintenance projects

Table 3: Regression results on contract closure and performance

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>Change Statistics</th>
<th>Sig. F Change</th>
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<tr>
<td>1</td>
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<td>.419</td>
<td>.412</td>
<td>.51909</td>
<td>.419</td>
<td>59.747</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Contract closure
b. Dependent Variable: Performance of the projects
Source: Field research findings, 2013

The findings in table 3 above show the correlation between contract closure and performance of road maintenance projects was positive and significant since Pearson’s Correlation coefficient \( r = 0.647 \) was high and \( p \) value \( (p=0.000) \) was less than the \( p \) critical \((p_c=0.050)\), suggesting a positive relationship between the two variables. From regression analysis, the amount by which a change in contract administration brings a change in road maintenance projects performance was found to be 0.412 (R square=0.412). This means that contract closure affects performance of road maintenance projects by 41.2%. In qualitative results, the two leaders were rather non-committal on the relationship between contract closure and performance of road maintenance, emphasizing that inspection of contract works was a role of technical staff. This implies that possible performance gaps can be associated with the competence of the
technical staff. Shen and Walker (2001) allude to time management as an important part of the construction management process. Acharya and Young (2006) also point out that any errors made in the process of meeting quality in technical performance, may result in loss to a contractor or dissatisfaction of the client. HHS (2012) urges contract managers to ensure that contracts are closed in a timely and effective manner in order to avoid any negative ramifications, financial or otherwise. Zhou, et al. (2007) concurs with this submission, reporting that in China, all contracts are required to be audited at practical completion stage. This is ideally a final account audit, requiring thorough investigation by the client. The audit identifies final project cost and reconciles the makeup of the final price, while noting any significant variations for further verification with authorities. Although in agreement with several aspects of the study, Young (2008), in a study on health services in United Kingdom, finds that contract termination (closure) occurs mainly due to contractor’s inability to perform the work to the required outcomes (efficiently) either as a result of under pricing or misunderstanding the specifications and non-inclusion of all transaction costs.

However, concerns of competence of the technical staff were also raised during interviews.

7.0 RECOMMENDATIONS, IMPLICATIONS, LIMITATIONS AND FUTURE RESEARCH

It is therefore recommended that capacity of technical staff be developed through training so as to fully understand and accurately implement provisions of the contract. Stringent performance measures should also be provided within contract clauses so that intentionally erring officials are adequately punished. Council should make a deliberate effort to involve all relevant stakeholders during the project process up to closure so that projects are owned by them and sustainability plans can be easily made and implemented.

Our study raises a number of implications that have to be addressed if road maintenance performance is to be improved. First and foremost, the Public Procurement and Disposal of Public Assets Authority (PPDAA) and Arua Municipal Council should work together to improve technical staff capacity in contract management and interpretation of contract clauses or procedures. The Municipality should first carry out a procurement skills assessment and training staff through refresher courses, workshops, seminars and conferences where staff meet and share experiences. The Uganda Local Government Association may partner with PPDAA and Ministry of Local Government in mobilizing training funds to build procurement capacity in the country for both staff and contractors.

This study is limited by a number of factors, whose analysis provides directions and areas for study in the area of contract management in Arua Municipality, leaving out other Local Government Entities (LGEs) and central governments. In Uganda, public and disposing entities are classified into two groups, the Central Government Entities and the Local Government Entities. The findings of our study cannot therefore be generalized to other entities, implying that there is need for studies to examine contract management in the road sector in other entities since the operating environments maybe different from those of Arua. Secondly, we note that road construction projects take long periods to be completed and circumstances may change over time. We therefore recommend a longitudinal study comparing central government and local governments attributes of project performance.

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PAPER IN PROGRESS

Paper preparation for the International Public Procurement Conference

Implications for offsets in Defence Procurement during austere time

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Abstract
Are offsets still relevant in defence procurement during austere time? Offsets is an economic development tool used by buyers in defence procurement to acquire various industrial, technological and economic benefits from the sellers of an equipment. It is claimed that offsets activity can prolong the procurement process and also increase the costs of procurement though there is little evidence to proof the latter. In times when defence budget is shrinking and the increasing need for effective and efficient public procurement is offsets still relevant in defence procurement?

Introduction
Global defence spending shrank to $1.7 trillion in 2012 and this declining trend is expected to continue for the next decade due to the continuing gloomy global economic environment. The shrinking defence budget has cautioned governments to find remedies by implementing cost-cutting measures and re-enforcing ‘value for money’ in defence procurement. However, in defence, nations also have to ensure sovereign capability, and these strategies work against the logic of economically effective procurement thus distorting the concept of free market forces. Because many states lack the size and technical capabilities to develop their own state of the art major weapons platforms they are frequently forced to buy very expensive equipment from other countries. However in order to enhance their own military capabilities, many countries choose to make the purchase of such equipment subject to policy requirements aimed at advancing their own national interests. The most common tool used in defence acquisition to achieve this end is known as offsets.

Offsets are most frequently conceptualized as economic compensation tools. The basic role of offsets is to ensure that in addition to the receiving the object of the primary sale buyers are compensated by sellers in various forms including technology, work packages, export opportunities and skills (development?) in addition to the primary sale. While offsets are widely practiced across all areas of defence procurement they are most frequently used in the aerospace and defence sector. Despite the notion that offsets reflect intervention, governments are increasingly using offsets as a policy tool to develop strategic industries and for wider economic development. The interest in economic development coming from mastery of hi-tech industries goes some way to explain why offsets are more commonly applied in aerospace procurements. More than 120 countries around the world enforce some form of offsets. Offsets are also becoming increasingly popular in the civil sector mainly in developing countries. Offsets are seen as a convenient route by many governments to seek the assistance of major define (OEMS) to build a
sustainable supply chain base; and a platform to leap-frog towards acquiring industrial and technological capability. Examples of using offsets in this manner include countries such as Canada, South Korea and Malaysia.

The opponents of offsets argue that this practice is inefficient, distorting of and clearly working against the principles of free market economy. Both academics and offsets practitioners argue that offset projects implementation increase costs and this additional burden is often loaded onto the main procurement contract thus escalating the total price of defence contracts. Considering that there may be an element of additional cost that may be created by offsets practice, the question then remains as to whether this tool should continue to be enforced by governments and what are the implications for offsets in defence procurement during austere time? This study will look at implications of offsets practice in defence procurement.

This paper will define offsets, review and examine the implementation of offset policies across the world. It will then provide an evaluation of the outcomes achieved by these various nations. In particular it will demonstrate that despite the global move toward the neoliberal agenda around free trade across nations, the implementation of offsets policies continues to grow. The paper then opens up discussion to take a strategic focus on the implications for offsets in defence procurement during austere times through an analysis of different regions. The paper then attempts to provide recommendations on the long term requirements of effectively implementing offsets in advancing industrial and technological development as part of defence procurement.

2. Defining Offsets in Public Procurement

What is Offsets?

Offsets represent a trade tool used by used by nation states as a vehicle to acquire additional socio-economic, industrial and technological benefits from sellers as part of an international procurement of large capital equipment or services. Offsets are practised by governments for both defence and civil procurement. There are various definitions to offsets. Udis and Markus define offsets as “an economic development tool used to create industrial and technological activities at the back of government procurement’. It is widely practised in the defence, security and aerospace sector but has become increasingly popular in the civil sector especially in infrastructure, transport and healthcare. It is a vast, pervasive business practice - involving tens of thousands of people around the globe estimated at ranging between five and thirty percent of world trade. “They claim that offset are a form of contract which imposes performance conditions on the seller of a good or service so that the purchasing government can recoup, or offset, some of its investment. In some way, reciprocity beyond that associated with normal market exchange of goods and services is involved.” The Bureau of Industry and Security, US (Year and P. No.) define offsets as ‘compensation practices required as a condition of purchase in government to government or commercial sales of defence equipment or services.’ Offsets are sometimes labelled as economic enhancement, industrial participation, industrial engagement, industrial collaboration, local content and partnership for development.

Broadly speaking, offsets are clustered as a subset of countertrade. Countertrade is much broader concept and includes barter, counter-purchase and offsets. First, barter is defined as exchange of goods in a traditional sense and this can become complex whether it is a switch or swap. Second, offsets are a form of counter purchase whereby the seller is paid fully in cash for the purchased product and in return the seller has to purchase products from the buying country in return for the same value or stipulated value different to ?. The product can be anything from raw commodities like palm oil, cocoa, rubber to manufactured products like electronics, plastics, furniture, automobiles. For example, when Malaysia bought the submarines from France, Malaysia paid for the submarine in cash but in return France was obliged to buy crude palm oil for 40% of the contract value. Third, offsets are further divided into two categories - direct and indirect.. Direct offsets are generally defined as activities that relate directly to the equipment or services being purchased. Indirect offsets include activities that are unrelated to the equipment or services being purchased. Direct and indirect offset activities include co-production, licensed production, sub-contracting, buy-back, marketing, overseas investment, technology transfer and training.
As the study of offsets as an academic discipline is a very recent development scholarly journal articles and books written on this subject are rare. (refer Martin 1996 and Brauer and 2006 for examples of edited books). Journals such as Defence and Peace Economics, Security Challenges, and define (RUSI) have also occasionally published articles on offsets. However both the books and journals on this topic have been mainly limited to descriptive case studies of specific nations. In recent years trade journals such as Jane’s Defence Weekly, Financial Times and the Economists have demonstrated a trend of increasingly discussing issues associated with offsets. This increasing interest by trade journals in offsets has been matched by the actions of several trade associations running international conferences on the topic (e.g. Aerospace, Defence and Security (ADS) in the UK, Global Offsets and Countertrade Association in the US, European Countertrade and Offsets Club (ECCO) in France, DKF in Germany and Congress of Indian Industries (CII) in India). Therefore offsets continues to be an area of increasing activity and as such worthy of far more academic investigation that has been the case to date.

History of Offsets

The origin of offsets practice can be traced back to 1870s during the Meiji restoration when the Japanese tried to acquire technological and industrial development without having to undergo an industrial process akin to the British Industrial Revolution. Offsets were formalised by the US government within NATO member countries in the 1940s after the Second World War by encouraging defence contractors to grant offsets to rebuild their allies defence industrial bases and support the Rationalisation, Standardization and Interoperability (RSI) provisions of NATO. Subsequently, offsets were used as a commercial tool to lure sales when demand of US defence products declined in the 1950s and 60s under the Kennedy Administration. Offsets were then incorporated in international business sales and marketing as a commercially competitive tool used within a strategy designed to win sales. Since the 1970s, many of the US allies and other nations have started demanding offsets as a condition of market access. The end of the Cold War in the 1980s and the widespread adoption of the neoliberal agenda, and in particular its emphasis on globalisation brought another of the defence economy. With nations seeking to increase the role of offsets, offsets has become an integral part of international defence business and public procurement.

Are offsets obligations really on the surge?

There has been an increasing debate as to the relevance of offsets and whether it is truly contributing to the economic development of nation states? Many scholarly articles have been written on this subject questioning the relevance of offsets in the present economic climate when most nations have, or are reducing, their defence budget. Exceptions being Asia (e.g. Japan) and the Middle East such as in Saudi Arabia, UAE and Kuwait. Policy initiatives taken by several organisations and governments around the world (e.g. within the European Union) has sought to severely reduce and if possibly eliminate offset requirements and obligations in defence procurement. However, the trend data suggests that these policies have not been effective. As geo-politics interests/issues becomes increasingly complex coupled by diverse political and economic interest, offsets has in fact become increasingly popular in many parts of the world. Many countries have now learnt from the best practices of other countries which have worked out the various models in offsets that can be used to achieve specific outcomes. As a result around 78 countries have adopted and implemented progressively more developed offset models which they apply to achieve to defined strategic goals offsets. This figure is expected to grow.

Why are offsets becoming increasingly important in defence procurement? This question can be analysed from two perspectives. First, the demand or country perspective which relates to national aspiration and strategic and industrial development goals. Second, the supply perspective where offsets are used as a leverage tool to attain a competitive edge in a international defence business.
3. Demand Perspective

*Industrialisation – ‘take-off’*

The first reasoning is associated with the modernization or linear stages of growth model theory introduced by a developmental economist, W.W. Rostow. According to this theory, there are five different stages that a nation must undergo before they become a fully industrialised country. The five stages are: stage one – traditional (primitive), stage two – pre-take-off, stage three – take-off, stage four – mature and stage five – mass consumption. Rostow’s argument was that every country will have undergone these five stages and in order for a nation to move from a pre to take-off they must embark on industrialisation. According to Rostow, The third stage, the ‘take off’, is viewed as the most important period amongst all the stages, when all the ‘old blocks and resistances to steady growth are finally overcome’ and when ‘compound interest becomes built, as it were, into [society’s] habits and institutional structure’.

During this stage, there is a rapid increase of economic activity fuelled by equally sudden spurts of savings, investments and radical technological change. A new entrepreneurial class emerges, agricultural productivity improves and resources, including population, begin to move into industrial activities located in towns. At the fourth stage, industries become mature. Rostow claims that during the fourth stage, nations will invest 10-20% of their national income towards new production capacity. Industries will forge ahead, mature and level-off whilst new industries will arrive on the scene. This era witnesses a mature economy and society, resting on the absorption of home-generated technologies. Finally, in the fifth stage of mass consumption, nations reach a level where their economic system is able to produce a surplus. At this juncture, leading sectors of a nation shift from heavy industries towards consumer durables and services. Therefore, many countries especially in the developing nations believe in and have adopted Rostow’s idea. This idea sees offsets as a tool which can be used (especially in the defence and aerospace technology) to industrialize their nations in order to be able to create an environment for more economic progress. There are of course many counter arguments to Rostow’s theory of late especially as nations learnt other methods to shorten the process without having to undergo all the five stages sequentially.

**Closing the technological gap**

The second reason relates to nations becoming industrialised quicker without having to go through the five stages as claimed by Rostow. The technology-gap theory emphasises technological backwardness and the need for catching up with technology leaders. The underlying mechanism of knowledge diffusion in this stream of thought is a mastery of a developed country’s technology by developing countries. This theory clearly recognised the need for building sufficient domestic capabilities for imitation of technological knowledge but also recognised the huge costs involved. Without a sufficient level of domestic capability, requiring massive investment, a country is unlikely to benefit from the technological knowledge of developed countries and thus faces the risk of continuously lagging behind advanced countries. Many nations decide to acquire technology instead of developing them from the scratch for various reasons. Some nations do not have sufficient capital and human resources to develop technological capabilities in the specific technological areas. Others have to compromise between allocation of R&D for technological development and to other socio-economic needs. In such cases, the most effective method will be to acquire technological capabilities from overseas. This can be done either as an outright purchase for technologies that are readily available off-the-shelf or through procurement for more specific or critical technologies obtained through offsets. For OEMs, within the technological curve, a company that had developed the technology will eventually decide to export when the technology is at the other end of the spectrum. For the technology acquirer, FDI, joint ventures or strategic collaboration is more effective method to leap-frog and obtain the technology without wasting too much time and money. This process allows buyer nation to ‘catch-up’ with the seller country thus reducing the technological gap. Offsets are seen as an easy route to technological leap-frog and catch-up through the procurement.

**Breaking the technology monopoly**

Another school of thought called endogenous growth theory or new growth theory argues that technology is appropriated and monopolised by its innovators. Once technology has been mastered, it is difficult for others to catch-up due to the difficulty of increasing returns to scale of physical and human resources, and geographical localisation of technology. Today, technological leaders attempt to restrict transmission of their most advanced technologies to foreign competitors and protect their intellectual property rights, especially from the encroachment
of developing countries. Recipient governments and firms, however, attempt to obtain control of these advanced technologies, as these have become factors in economic growth and international competitiveness. There is a greater emphasis on innovative investments, human capital accumulation and externalities as the dominant factors that determine long-term economic growth. Again, offsets are seen as a vital tool to assist in attaining these goals.

*Self-reliance/self-sufficiency (technology ladder)*

The third reason for offsets, especially in the defence sector, is associated to national aspirations of wanting to move up the technological ladder from a net importer to complete indigenisation. Figure 3 shows that there are five stages to indigenisation. Some countries are placed at the top as net purchasers and others at the bottom as had achieved total self-reliance which means that these countries are able to design, manufacture, assemble, integrate, maintain and market the products (a womb to tomb process). There are very few countries in the world which are totally self-sufficient in the world today, the possible exceptions being the USA, Russia and maybe China. Nations use offsets as a catalyst to acquire technology either through reverse engineering, licensing, co-production and etc. to be able to move up the technological ladder and become self-reliant. These are done for reasons of being able to independently defend one’s nation in times of crisis.

![Figure 2: Herbert Wolf’s Five Stages of Defence Industrialisation](image-url)

**Import** of equipment for repair, maintenance and overhaul

Of imported weapon systems. Foreign suppliers export

**Assembly** of imported arms, components, subsystems and unassembled kits of particular weapon systems are purchased abroad and assembled domestically

**Local production** of simple components under license though sophisticated and more expensive parts continue to be delivered from abroad. License-produced and imported components are then assembled domestically

**License-production** of near complete weapon systems. While the number of imported parts is reduced so that the weapon is produced domestically many sophisticated components still have to be imported.

**Indigenous design and production** of weapon systems. This stage can be initiated, at least for technologically advanced weapon systems, on the basis of many years of production experience and when sophisticated and diversified R&D facilities are set up. Design and production are often still dependent on know-how and technology input from

**Globalisation of industry and supply Chain**

The fourth reason for offsets is associated to globalisation of local industries. Many local industries are still protected largely through ‘infant industry’ protection scheme and other local content requirements. Such policies are enforced to ensure that the local industries are not completely wiped out in the process of globalisation where only the best and most competitive industries survive. In such an environment there is an increasing pressure to liberalise and open-up the market through regional economic forums, tools such as offsets are used by many nations. First, to gain a quicker access to industry knowledge and best practices through offsets in order to close the technology gap and make these industries ready to face a more competitive environment once at a level-playing field. Offsets are used by many nations to seek expert assistance for skills development, process improvement, export facilitation, training, education as well as assistance in penetration of the global supply chain as well as sustaining high-value added activities.

**Political justification**

Finally, as defence is an intangible asset and its outcome (is often?) non-transparent, defence spending normally comes under scrutiny. There are questions as to why should we buy tanks or fighter aircrafts when we are not going to war? For instance, the opportunity cost of spending scarce resources on 15 fighter aircrafts against building a hospital in a village for 300 people?. Within democratic nations in particular, these types of questions put pressure on politicians to justify the socio-economic and industrial benefits of offsets compared to spending this money on other initiatives.

4. **Supply Perspective**

**Competitive Advantage in a Winning Sale**

Strategically firms operating in a competitive environment have to be aware of and respond to their internal and external threats in order to ensure survival. Porter’s five forces analysis emphasises the five key elements to competition. Porter refers to the threat of new entrants, threat of substitute products or services, bargaining power of suppliers, bargaining power of customers (buyers) and intensity of competitive rivalry. From an industry or firm perspective, the shrinking defence market has made defence sales extremely challenging and increasing the bargaining power of the customers. For certain products such as fighter aircrafts, battle tanks, warships and communication systems, there is the threat of new entrants as several companies offer the same product or the chance of substitution of products and services to meet the highest level of technical specification. The competitive rivalry amongst defence firms results in buyers being provided with a wider choice of products which offer best value relative to cost. In these circumstances the point of differentiation moves from the product to the offsets offering. It is therefore often the case that the bidder with the best offsets offer is also awarded the contract.

**Long term Strategic Partnership**

Many trade theories on foreign direct investments argue that OEMs operate on a ‘fly by night’ model whereby they move their company to the operations with lowest cost. It is claimed that OEMs do not have commitment or loyalty towards national industrial and technological development in the countries where they operate but business is done on a purely commercial basis without any long term commitment. However, offsets is claimed to negate this effect through enforcement of long term commitment in the business projects. Both industries and governments work towards ensuring a sustainable partnership by working through joint-ventures, collaboration and partnering.

**Alternative Source for high-technology Supply Chain**

OEMs often decide to relocated some part of their firm activities to low costs destinations overseas. The decision is taken to reduce the overall production cost. Globalisation has facilitated this process whereby industries are able to move across borders much easier to set-up their factories and train manpower to undertake the outsourced work. However, many scholars argue that most of the outsourced jobs are those that are low on the technological curve and which are not feasible to be retained in the OEM’s original country. Offsets policy however is frequently used to limit this tendency by not only encouraging but contractually obliging OEMs to ensure high-value added high-
technology such as aerospace and defence related jobs to be outsourced to third countries. OEMs claim that this has had a positive impact by creating greater efficiency and effectiveness within the global supply chain where they have a larger pool of suppliers to choose from. Also, suppliers in the home market are driven to become more efficient in order to sustain their businesses.

6. The Impact of Offsets

Developed and developing countries seek offsets for political, economic, industrial, trade, technology, and military for various reasons. There are two competing schools of thought on the impact of offsets. The first views offsets as a facilitating mechanism towards industrial and technological development; the latter views them as inefficient and costly. Proponents of offsets claim that they are a critical policy tool in public procurement and should be enforced by governments to leverage maximum economic benefits. This school promotes the ‘visible hand’ approach thus encouraging direct government intervention in economic development through offsets policy. Offsets proponents claim that offsets have created socio-economic benefits and have had a positive impact on national industrial and technological development. These claims are then substantiated through empirical data and case studies to prove the long term impact of offsets projects for national development. Opponents of offsets claim that offsets goes against the practice of free market. They claim that offsets practice leads to distortion thus promoting inefficiency and price escalation in the demand and supply environment.\textsuperscript{15}

The pro-offsets school of thought argues that offsets have generally benefited purchasing countries in terms of creating an indigenous defence industrial base, advancing technology development, increasing defence–civil integration, expanding job creation, promoting exports, enhancing human resource development and generating high-value added backward linkages. However, for developing countries with smaller defence industrial bases, offsets have been maximised for indirect purposes mainly for spin-offs into civil sectors. Offsets have also, arguably, created ‘value-added’ manufacturing jobs in the backward supply chain, providing home-grown industry with the opportunity to enhance competitiveness though collaboration and joint ventures with supplier companies.\textsuperscript{16}

The opponents of the offsets school of thought view them as ‘economically inefficient’ and market distorting.\textsuperscript{17} They create a financial burden to buyer countries by adding an extra ‘hidden cost’ thus further escalating defence equipment costs. The US Department of Commerce, for example, claims that offsets are discriminatory, trade distorting and against the interests of free trade.\textsuperscript{18} Two major studies undertaken to evaluate the impact of offsets have resulted in negative conclusions. In the first of these studies, the US government evaluated the impact of offsets on the US economy and its industrial base, especially from the outflow of offsetting investment.\textsuperscript{19} The study claimed that US subcontracting jobs and crucial technologies were lost due to the use of offsets in foreign defence sales.\textsuperscript{20} A second study by York University on the UK Industrial Participation Policy, also specifically stated that (?) its impact on the UK economy, was negative.\textsuperscript{21} Recently, this negativism has found expression in policy statements. For instance, the US National Defence Authorisation Bill 2005 proposed that offsets be outlawed, or at the very least curtailed., Evidence from the US defence industry indicates that 469,000 jobs were lost as a result of offsets in the past 20 years.\textsuperscript{22} The US Defence Department argues that weapon sales due to offsets sustained more than 40,000 U.S jobs a year whilst only creating about 9,700 jobs overseas.\textsuperscript{23} This could be due to the highly competitive and complex nature of defence technology. The massive decline in US defence-related jobs is arguably due to the 1990’s major consolidation and restructuring of the US defence industry. Notwithstanding such development, the jury is still out as to whether offsets are a positive or negative force.

The scenario is different for emerging economies. Offsets have grown in popularity and are viewed by emerging countries as a ‘third way’, for technology acquisition and development.\textsuperscript{24} Offsets have the potential for impacting on defence industrialisation, value creation through inter-industry linkages, economic diversification, human resource development and product and process localisation. The Newly Industrialised Group of Countries (NICs), including South Korea, Singapore and Taiwan have displayed their ability to absorb new technology and catch-up with developed countries. The developing countries have pursued roughly similar paths of economic and industrial development, involving large-scale State investments, technology imports, applied research and synergistic civil-military links.\textsuperscript{25} Yet, for these countries, the government has had a ‘visible hand’ in decision-making, ensuring that
Successful technology transfer took place. Successful technology transfer initiatives to these countries were mostly through foreign direct investment, joint ventures, collaboration as well as offsets. Efforts have been directed by many nations to position offsets at the core of defence industrialisation. There is an increasing recognition that defence technologies should be spun-off into the civil industries. Whilst suppliers have been reluctant to invest in high tech plants, countries such as South Africa and South Korea have tried to create supply chains through backward linkages into manufacturing industries. They have pursued defence indigenisation to maintain national sovereignty and territorial integrity. For instance, Japan aggressively pursued indigenous defence production or ‘kokusanka’ via this method. South Korea and Taiwan have also been heavily involved in defence industrialisation, aimed at achieving autarky in arms production as part of their defence policy and industrial objectives. Today, these countries have reached a higher level of industrial capability as opposed to many of the other developing nations.

South Africa has also pursued defence industrialisation through its Defence Industrial Participation Policy. Denel (Pty) Ltd, a leading South African defence company, successfully built the tail sections of RAF Hawk fighter trainers, landing gear fuselage sections for the Swedish Gripen jet fighters, rudders and ailerons for BAE Systems aeroplanes. It was claimed that R104 billion worth of industrial participation commitments in South Africa would create approximately 65,000 jobs. Countries such as Singapore and Indonesia have taken the middle road as their defence industries are not as large scale as those of South Korea and Taiwan but are, nevertheless, wide ranging. However, others like Malaysia see offsets as a major thrust for economic development and technology acquisition with a specific focus on defence technology spin-offs, skills development and the creation of backward linkages. Malaysia is also seeking defence industrialisation through offsets, in similarity to both South Africa and the other NICs. An empirical study on the impact of offsets on Malaysia’s defence industrial and technological base had proved that offsets has been largely successful in transferring technology in the maintenance, repair and overhaul capabilities (MRO) activities mainly in the aerospace sector in Malaysia besides some level of manufacturing capabilities in composite and metal parts through collaboration. However, there has been less impact on the research and development incorporating design capabilities and export opportunities. Offsets has also helped develop human skills in high-technology sectors in Malaysia creating a readily available pool of human capital for the high-technology sectors especially in defence and aerospace.

#### 7. Role of Offsets in Defence Procurement

Defence Procurement is complex and involves a lengthy process. In some countries, a special organisation department is formed within the specific nation’s defence organisation to manage defence procurement. Others set up special agencies that are independent to manage not only the procurement function but also to consider the development of local defence industries and technology acquisition with a view towards indigenisation. For most countries with a requirement for industrial and technological development aspirations, procurement requirements will specify offsets in the requirement for procurement (RFP). The final procurement will be decided based on three criteria being technical specification, price and offsets. The weightage on the three component will be decided by the procurement committee based on the tender documents and the proposals that have been submitted for all types of procurement be it direct negotiation, government-to-government or competitive bid. The OEMs normally are provided the opportunity to present their proposals to the Offsets Authorities in the dedicated Offsets Department. The Offsets Department is normally a separate entity wither located within the Ministry of Defence, Ministry of Economy, Finance or Trade and Industry. The proposal can be further refined upon receiving feedback from the offsets authorities before being submitted as part of the bid. Normally the proposal cannot be changed or modified once the procurement committee have selected the winning OEM. In practice, procurement based on competitive tendering tend to obtain better offsets packages as OEMs try to offer the best offsets projects in order to outbid each other resulting in the buyer country and its offsets recipients gaining maximum benefits. Offsets projects can be part of a main procurement contract or a separate contract. Offsets are said to increase the costs of offsets. This remains a contentious widely debated issue. The issue has centred on whether offsets should be incorporated as part of defence procurement when it increases the cost of the procurement activity. The other thorny issue is as to whether offsets practice slows down and increases the length of procurement contract negotiation, sometimes up to three times longer than the amount of time that the negotiation should have taken. Although there is no empirical evidence to prove this claim there have been debates at international conferences that offsets slows down the procurement contract finalisation process due to disputes on deciding issues such as final value of offsets,
multipliers, deciding offsets beneficiaries, time-line and percentage of penalty and performance bond. There have been efforts to eliminate offsets at the outset due to some of these complexities around defence procurement.

8. Implications for offsets in defence procurement during austere times

The implications of Offsets on defence procurement had been varied across the globe. This paper now discusses the implications of offsets in defence procurement in the European Union.

European Union (EU)

Offsets have been an age old practice within the EU states. Each EU member imposes vigorous offsets conditions in order to build its own defence industrial and technological base. Normally the stronger EU member states such as France, Germany and the UK are providers of offsets whilst others such as Spain, Poland, Portugal and Sweden are recipients of offsets. The intra-European offsets trade is one of the largest in proportion due to the size of its defence procurement expenditure. In the EU, in 2009, the total defence procurement expenditure of 25 member states of EU totalled Euros 160billion whereby one fifth was military equipment, including procurement and research and development (R&D). The recent financial crisis that swept the EU countries has resulted in the reduction in defence spending which in turn has reflected on the existence of the European Defence Industrial and Technological base (EDTIB) and usage of offsets in defence procurement in EU. There has been a counter view to offsets practice in Europe claiming that it is creating duplication, inefficiency, and wastage of resources within EU countries. The European Defence Agency (EDA) has passed rules to eliminate offsets in defence procurement to create a more transparent and level playing field in the creation of EDTIB. This has not been accepted positively by all EU countries – smaller ones claim to still require offsets to protect their DTIB. There are two opposite views to either still retain offsets for national security or eliminate offsets and create a consolidated EDTIB.

The EU public procurement is regulated by Directive 2009/81/EC. Although offsets are not explicitly mentioned in the directive the EU has explicitly stated that offsets are illegal and cannot be used as a discriminator in defence procurement decision making. In the Guidance Note Offsets, by the EU Directorate General Internal Markets and Services (DG MARKT), states that offsets ‘violate basic rules and principles of primary EU law’, especially equal treatment, non-discrimination and the free movement of goods and services. The 2009 Directive makes offsets trading very uncertain for OEMs providing defence equipment and services to EU countries. Directive 2009/81/EC is specially designed for the defence market in Europe and this directive will now regulate most of the contracts. Directive 2009 regulates the procedure for contract awarding and affects the possibilities of member states to choose a tender with offset agreement over one without one. Prior to the introduction of Article 2009/81, companies were free to shape their contracts covering public procurement of defence material with little regard to regulations of the internal market. Now most OEMs are uncertain especially on offsets to be offered as part of tender in contracts concerning defence procurement. However, offsets agreements, both direct and indirect, can be exempted on the basis of Article 346 TFEU if they support an essential security interest. Article 14 in Directive 2004/18/EC and Article 346 of Treaty of the Functioning of the European Union (TFEU) is still invoked in special circumstances where the procurement involves national security interest.

The new rule imposed on offsets and its role in EU defence procurement has become a highly debatable and contentious within the EU member states. France and Germany claim little or no impact on their defence procurement as they traditionally do not practice offsets as part of their defence procurement. Both countries however have a matured and highly self-sufficient defence industrial base. The new directive and its implication to offsets have had greater impact on EU nations which are still highly dependent on offsets to sustain and enhance its DTIB. Some of the issues raised by these nations include the continuous security of supply for defence and security products and service. As under the new directive all governments have to open their procurement activity on a competitive basis, EU countries are also not allowed to request for offsets for overseas OEMs. This could also impact on the flow of technology and employment opportunities for EU as overseas contractors as they may be incentivises to now divert their offsets requirement into other non-EU countries with stricter offsets requirements. In the longer term, such action could drain the EU EDTIB and starve the continent of any new technological development. At the same time, directive 2009 is also developing a divide between the major defence producers and smaller countries within EU.
In a recent conference on Offsets in Europe: Implementation of Directive 2009/81/EC organised by the European Club for Countertrade and Offsets, several European countries addressed the issue of how this new directive has impacted their plans of sustaining their DTIB. Most of these countries claim to have transposed Directive 2009/81/EC into their defence procurement activity and that offsets are only invoked for procurement that can be justified for national security interest complying with Article 346 of TFEU. Belgium for example mentioned that their procurement system is fully transparent and all international tenders are based on a level-playing field thus providing equal opportunities for all EU members. However, the Belgium procurement process is highly innovative to be able to provide huge opportunities to the Belgium SMEs to be part of the supply chain and to undertake sub-contracting work as part of the procurement activity. Czech Republic on the other hand mentioned that the Ministry of Defence was forced to transpose Directive 2009 and eliminate offsets through the government was not ready to adopt the new directive. Countries like Denmark mentioned that they still have 32 existing offsets obligations under the various offsets programme with 15 banking agreements that need to be fulfilled by OEMs. In the UK, the UK MOD considering the Strategic Defence and Security Review (SDSR) had reviewed the existing UK Industrial Participation Policy and replaced with a newer approach called the UK Industrial Engagement Policy (IEP). The key aspect to IEP is that participation is voluntary and the implementation is separate from UK MOD’s procurement process. Further, there will be no targets for participating companies but in return an annual report on activities must be submitted to the UK MOD. The new policy emphasises partnership and the requirement for companies’ to understand MOD’s priorities.

On the whole it was felt that the implications for offsets due to the new procurement Directive 2009/81/EC could have both positive and negative impact in the long term. On the positive side, the elimination of offsets could see a consolidated and rationalised DTIB with reduced wastage and duplication. The EU’s unified EUDTIB could be on par with the US’s industries to face the increasing international competition. On the negative side, it is claimed by many that the elimination of offsets practice in the EU could create massive losses of technology and to the industrial base over the long term. For instance it is posited too profound, adverse impact on supply chain as work goes outside the EU and a technology development and retention is diminished. While offsets have been eliminated within the EU, EU OEMs will still be required to offer offsets in the export market. This will drive the OEMs to focus more on offsets for export markets rather than intra-European offsets. Most importantly, there will still be an issue of trust between the EU member states as to how much industry and technology can be developed on a work-share basis as opposed to still retaining the industrial and technological base in-a country for reasons of national security and economic prosperity. The debate on a unified and open EU as opposed to a national security and protection of individual nation’s economic prowess will still continue.

Rest of the World

In the rest of the world such as Asia, Middle East and Latin America, defence budget had been increasing over the years. At the same time, these countries have been monitoring the offsets impact in the EU and US and how these countries have used offsets to develop their DTIB. There is an increasing hunger for technology and indigenisation in many countries especially for those with very huge procurement spending such as India, Saudi Arabia, the UAE, Brazil and South Korea. These countries have developed very stringent offsets policies with high offsets value in order to obtain maximum technology and other economic benefits via offsets. Offsets are imposed as part of procurement for purchases above a certain value and this varies for each country. The offsets threshold value is normally pre-determined by the Offsets Authority. Although most offsets policy will mention that offsets should not increase the cost of the procurement in reality it is understood that a certain allocation will be made in the procurement to fund the offsets projects. The buyer nations are willing to pay in order to obtain the technological and industrial benefits. It is often debated as to how effective or to what extent has the buyer nation really benefited from this additional cost and what are the multiplying effect to its economy.

Offsets had taken a more important role by playing the deciding factor in defence procurement of certain countries such as when the Indian MOD decided to buy the fighter aircrafts. It is claimed that Rafael was the preferred choice as opposed to the other contenders due to the offsets content where more than 50% of the aircraft was to be produced locally and HAL, the largest Indian aeronautics company, to be appointed to manage more than 1000 suppliers thus creating a robust supply chain for the Indian defence industry. Similarly, when Malaysia tendered for the transport helicopters, the EC 725 was chosen based on the basis of the offsets programme to place the regional maintenance and a simulator centre for all Ecuriel helicopters in Malaysia.

Some of these countries have revised their offsets policies such as the UAE, Malaysia, Turkey and South Africa by incorporating additional requirements and measurements for offsets outcome. There is greater emphasis on
technology transfer and high-skilled employment creation. These policies have also introduced tougher laws for non-performance with penalty and performance bonds to non-performing OEMs. There is also a surge in the number of new countries that have developed a keen interest in offsets such as Mexico, Chile, Indonesia and Columbia. Offsets demand is predicted to continue to grow in other parts of the world mainly for reasons of acquiring technological and industrial benefits both in the defence and civil sectors irrespective of austerity.

The relevance of Offsets in defence procurement during austere time?

There are two opposite views as to whether offsets should remain as part of defence procurement in austere time. The proponents of free market capitalism will continue to oppose offsets on the grounds of market distortion. As leading to an inefficient industrial base with duplication and further increases to the cost of procurement. This group argues that the impact of offsets is not tangible or is very minimal as opposed to the price paid for an offsets programme. Further, it is claimed that the overall offsets process itself is not transparent and tainted by scandals and allegations of corrupt practice. These arguments help illustrate that here are many grey areas around offsets and it is, and remains a complex topic. Therefore, besides the efforts by the EDA and EU, there will be continuous efforts such as by Transparency International to completely eliminate offsets and let each nation compete on a level playing field. On the other hand, another group mainly consisting of offsets proponents continue to promote offsets as tool for industrial and technological enhancement. This group view offsets as a ‘third way’ for economic development and will continue to propagate offsets in public procurement.

During austere times when defence budgets are being slashed and governments have to consider allocations for competing means offsets will come under greater scrutiny. Generally there will be a greater concern to measure the outcome of offsets and how it has benefitted the wider public and just not the defence industry. Governments and industries have to work much harder to ensure greater transparency in managing offsets as part of public procurement. Both industries and governments should take the responsibility in developing a more transparent mechanism to manage the whole offsets life-cycle. This should include openness in developing the offsets strategy and policy as well as implementation. These include decisions as to how the offsets programme is finalised, how the project beneficiaries are selected, the offsets value calculation and justifications to the multipliers and impact measurement. Efforts should be made to ensure that defence procurement generates high quality offsets projects at low investments; thereby resulting in creativity in generating offsets projects. As there are signs that offsets will still remain relevant and will only continue to grow, it is absolutely vital to inject this policy tool into defence procurement with greater structure and clarity instead of having offsets being accused of being ‘smoke and mirrors’ and ‘the dark art’ of procurement.

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3 However, the principle behind all these labels are similar where host country or the buyer normally will impose a requirement on the seller to deliver some form of economic benefits to ensure that there is some level of technology transfer for local socio-economic development.
6 Refer to the Epicos website for a list of offsets practiseing countries around the world. EPICOS, Country Offsets Policy, [online], (EPICOS, Athens, 2002), (Accessed: 11 June 2005), Available at: http://www.epicos.co.uk.
7 Ibid p.3.


"Op cit, p.176.


"quote WTO rules and that offsets is against WTO rules except for defence but developing countries are exempt from offsets

"See A O Hirshman, (1958): The Strategy of Economic Development, (Yale University Press, Clinton, M.A. for the poles of development argument on how defence production is meant to trigger “backward and forward linkages” to other industrial sectors.


" Ibid, p.4.


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Pricing for Public Purchase -

A Qualitative-Empirical Analysis of Public Procurement and Price Setting Practices

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1. Introduction

Public purchase has an essential impact on the economy. In Germany goods and services for about 360 billion Euros are ordered by public institutions such as governmental departments, town councils or other public establishments (e.g. fire or police departments) (\textit{\O{}ko-Institut} 2008). This includes about 17\% of the German gross domestic product. In the meantime, the Consolidated Federal Funds Report mentions a number of over 500 billion Dollars that were spent by federal institution in the US (\textit{Consolidated Federal Funds Report} 2008). For getting the goods and services in the most economical way, basically two key-questions come up: 1) How do we find the contract partner who is able to satisfy public needs for goods or services as cheaply as possible with sufficient quality? and 2) Is the price appropriate?

These questions might be easy to answer for products and services that are part of everyday life where impressions about the adequacy of offers and prices can be researched with low effort. But especially for complex and individualized products (e.g. military equipment, IT or research and development services) there might not exist an obvious market with several suppliers and customers. When market mechanisms fail, the above mentioned questions are highly relevant to make sure that tax payers’ money is not wasted inefficiently. To meet these requirements, states implemented rules to find the appropriate contract partner and price for public orders under cost effective and money-saving aspects. Despite a highly globalized world where companies specialize their products and services to have advantages in a worldwide competition, public purchase systems still remain very national. While there is a tendency towards a harmonization of public procurement in Europe, pricing regulation still remains exclusively in the hands of individual states. International comparative studies on the price finding process for public purchase contracts are missing.

In Germany basically, public procurement and pricing regulation are individual but connected to rules the intention of which is to give answers the above mentioned questions. To answer question 1), \textbf{Public Procurement} regulation was implemented to the process of public purchase. Public Procurement is a regulatory instrument that helps federal
institutions to generate and decide about the most economic offer of potential contract partners for public needs. Fiscal aspects create the motivation for this instrument.

When the best fitting offer is filtered out, question 2) comes up. To ensure that the price for a public contract is appropriate, Price Regulation was implemented to the process of public purchase. Price regulation for public purchase displays a discrete framework to find the adequate price based on market mechanisms (Hoffjan/Hövelborn/Strickmann 2013). In monopolistic settings market mechanisms might fail. In these settings price regulation provides norms to calculate prices based on a “costs-plus-profit” approach.

As Germany (VO PR 30/53 with LSP) the United States (Federal Acquisition Requirements) use a public procurement and “cost-plus” pricing regulation system to protect themselves from excessively high prices but also to guarantee companies to get the full costs they had for compensating their effort. Pricing regulation in Germany was implemented in 1953 mainly with a focus on military goods and public constructions. It is still enforced without any serious reformations. Current circumstances as e.g. a significantly higher relevance of the services sector compared to the industrial sector as well as changing (cost) accounting practices (e.g. HGB after BilmoG and IFRS, USGAAP) have not been adequately considered yet. Problems with company-internal calculation and price-building processes especially for IT or research services are the consequence. That is why in Germany a reform of the existing framework is discussed.

Despite of its relevance for public purchase, price regulation is not widely issued in science and practice. The objective of this paper is to empirically analyse (1) the common practice of how the actual system for public purchase in Germany is disposed and (2) to assess if and at what point of the purchasing process problems occur. Finally we give (3) recommendations for how the existing system or the habits of involved parties have to change. Therefore we use a qualitative grounded-theory based approach with 20 interviews among price auditors and companies with experience in the public purchase process. By the development of hypotheses about their relationship we attempt to create an in-depth understanding of the actual regulatory framework and its problems. Besides an investigation of public procurement and price regulation processes in Germany, a special focus of our paper is on situations where market mechanisms fail so that cost-based pricing regulation comes up.

In a further step of this research project, a comparison of German practices with the regulatory system in the United States of America is planned (1) to assess problem-solving approaches and (2) to give advice about an international harmonization of public procurement and pricing systems. The close relation and economic similarities between Germany and the United States of America as well as an advanced history of the United States of America in regulation can provide conclusive information for a best-practise regulatory design of price regulation for public acquisitions.

This paper proceeds as follows: In section 2 we review the existing literature regarding the design and implementation practices of public procurement and cost-based pricing regulation in Germany. The methodological approach of our study is described in section 3. In Section 4, we present the empirical results on the procurement and pricing process for public purchase. Section 5 concludes the paper with a discussion of our results with regard to controversies between theory and practice and with suggestions to smooth out existing problems. Furthermore opportunities for future research are worked out. In section 6, this paper is classified into the overall research project.
2. Public Purchase System in Germany

The system that is designed for public purchase in Germany basically consists of two parts. While the first part includes the procurement process for public utilities (*basically through the prescription of VOL-A*), the second part includes the regulations of the price setting process (*VO PR 30/53 and LSP*). Both rules are individual but connected. In this section firstly the theoretical framework for public procurement and secondly pricing for public purchase are shortly illustrated.

2.1 Public Procurement System

Basically, the system for public procurement in Germany is separated into three parts. VOL-B deals with the procurement of construction works. VOL-F focuses free-lancer activities. In VOL-A the process for residual procurements of goods and services is organized. Pricing regulation for public buildings is organized differently from goods and services. That is why in this paper we focus on public procurement and pricing regulation for goods and services except constructions.

While for the procurement process above the threshold level of 200t € is harmonized at a European level to equalize the chances for European companies to get contracts with public institutions in entire Europe, procurement under this threshold level falls “only” under national rules. Anyway, both processes resemble each other with only few differences.

**Under the threshold level** basically two forms of procurement are provided. First, open or closed competitive bidding where the public need is announced by the purchaser so that companies can decide whether they want to give an offer or not. Open competitive bidding means that the public need is published without any constraint so that every company is potentially informed about it. Here, the number of participants is potentially unlimited. Closed competitive bidding means that companies have to be invited to give an offer to the purchaser. Therefore they normally have to proof their ability first. In cases when competitive bidding processes are initialized, the most economical offer out of a number of offers is taken by the purchaser. The criteria for what is seen as “economical” can be defined by the purchaser. Price and quality aspects or experience are examples for relevant criteria. Closed processes are preferred when potentially too many bids are handed in to the purchaser or when it is essential to get further information about the ability of companies to work off orders in the sense of the purchaser. Second, the public order can be given directly to a contract partner without a competitive bidding process. Here an invitation for tenders with discretionary award of contract is given by a public purchaser. In this case the company also sometimes has to give proof for their ability to work off the public order based on e.g. the above mentioned criteria.

Discrete procurement processes are used especially when competitive bidding processes do not lead to an adequate result or when highly specialized requirements for goods or services need to be discussed and developed in detail.

**Above the threshold level**, also open and closed competitive bidding are provided. Moreover, two additional procedures of public procurement exist. First, in a negotiation with or without an ability-check purchaser and supplier discuss conditions of a contract. Second, potential contract partners start a competitive dialogue about goods and services that should be produced. Both additional forms of procurement include the possibility of negotiations after the contract partner is already chosen. These modes are adequate if complex projects (as e.g. a transportation system in rough environments) need to be realized.
No matter what procedure of procurement is chosen, it results in the public purchasers’ decision for a proposed offer which includes an amount of money that quid pro quo has to be paid by the purchaser. Especially in cases where complex and specialized products or services need to be bought, there is an information asymmetry between public purchaser and supplier concerning the size of the price. Sometimes the public purchaser has only little experience about if the envisaged amount which is appropriate. Therefore public procurement ordinance refers to pricing law in which a system is provided that should verify an appropriate price for a certain public order.

2.2 Pricing Regulation

The main intention of the pricing regulation law for public purchase is to keep a justified price level. That means an adequate price based on market mechanisms should be paid for a public purchase. Like that, public institutions should be protected from unfairly high prices and also the supplier should be protected from inadequate low prices (Ebisch et al. 2010, p. 24). Compared to the cost-saving intention of the public procurement system, the intention of pricing regulation for public purchase is neutral. It only focuses prices that are as market-conform as possible.

Generally every public purchase in Germany falls under pricing law. In detail this includes contracts for public purchase of federal or local institutions (e.g. governmental departments, police, army) as well as public undertakings (e.g. state owned research institutes or municipal companies that are founded to satisfy local services such as waste disposal or street cleaning).

The German pricing law is organized in two steps. First, depending on the company and product-specific marketability, a price-type has to be identified. Basically, five price-types are provided by pricing law. These price-types are hierarchically organized. If requirements for a higher ranked price-type fail, the next lower price-type has to be checked.

The highest ranked price-type is a “by the state defined price”. It is used e.g. for medicine. It is not further part of our analysis because there is no price-finding process for this price type. Anyway it has to be mentioned for the sake of completeness.

The “market-price” is on the next step of the hierarchy (§ 4 VO PR 30/53). For having this price-type, an active market has to exist. Therefore pricing law provides the following requirements (Ebisch et al. 2010, p. 90ff). An objective market-price exists if products are traded so that everyone has to pay the same price in a fixed point in time. For a company-subjective market-price, prices for equal products or services have to be realized constantly with non-public contract partners. Contracts with other public institutions cannot be used to proof an active market.

If the requirements of a “market-price” cannot be fulfilled for a public order, cost-based pricing comes up. Based on a hierarchical organization, three cost-plus-based price-types are provided by pricing regulation for public purchase. The lower the hierarchical level, the more distant are active market mechanisms. To be as close to the market as possible, cost-based pricing calculation can comprise market-prices for parts of the final product or service.

For a “fixed-price” planned costs of products or services have to be clearly calculable. This is the case if there already exist enough experiences about the production process because of other similar orders (e.g. for other public institutions) (Ebsich et al. 2010, p. 137ff).
A “conversion-price” is designated for orders where there is not enough experience to be able to calculate transparently at the beginning of the production process, but it is expected that it will be possible at a certain point of the production. In this case, a conversion date is negotiated before the production starts. Before that point of time every costs that occur are reimbursed. After that point of time, the “reimbursement-price” is replaced by a “fixed-price” (Ebsich et al. 2010, p. 141ff).

The lowest price-type on the hierarchy is the “reimbursement-price”. This price-type comes up if costs for a public purchase cannot at all be planned in advance. In these cases, costs are reimbursed if they can be documented based on calculation norms that are provided by pricing law (Ebsich et al. 2010, p. 147ff).

Second, when the criteria of a market-price cannot be proofed, cost-based price calculation comes up. Pricing law provides a “cost-plus” approach where overhead costs are allocated to the cost-by-cause principle (LSP). Besides direct costs, pricing law provides the possibility to add calculatory costs to the cost-based prices (e.g. calculatory interests on operating assets). While there are exact norms for which costs can be included in the calculation, the benefit margin in generally negotiable between the contract partners. Previous studies mention margins between 1% and 6%, in exceptional cases more (Hövelborn 2014).

3. Methodology

In this study we use a qualitative-empirical approach based on Grounded Theory Methodology. Grounded Theory Methodology implies the process of building theory inductively by means of the qualitative analysis of data (Lueger 2009, S. 192). It therefore provides the researcher with greater freedom to explore the research area. As a consequence, Grounded Theory is useful in providing rigorous insight into highly complex areas that are relatively unknown by the researcher (Corbin/Strauss 2008, p. 8). As already mentioned, prior research in the fields of procurement and price setting practices for public purchases is relatively little. This process involves using the data collection via interviewing experts in the fields of public purchase and pricing.

Aim of the interview-sessions was to gain deep understanding about procurement and price setting practices for public purchases. Because not a probabilistic representativity is in the focus of this study, theoretical sampling was used (Charmaz/Belgrave 2012, p. 358f). With that structures and interrelations between key aspects and determinants can be seen. Generalizable hypotheses and theoretical models were worked out as a basis for further (quantitative or theoretical) studies.

The study was announced via email, interview appointments were acquired through following direct calls. Further interview opportunities were generated by personal references. Every dialog partner had an academic or professional background. The discipline was not necessarily restricted to experts with a strong focus on finance and accounting. The discussions can be strategically and operationally expanded and can cover financial as well as legal aspects. Data triangulation aspects were the reason for the dualistic approach of this study which includes the interviews of price auditors as well as of organizational interview partners. In summary it was possible to personally interview 26 experts in 20 interviews. 10 of them were generated within companies of defense industry, research and development, public-private-partnerships, IT industry as well as research institutes. Like that company-subjective perspectives were considered. For getting a neutral and overall-view of interrelations, the other 10 interviews were generated with price auditors.
The interviews were conducted from March 2012 till May 2013 and were all guided by a semi structured guideline consisting of a pool of 30 open questions. These questions were mainly deducted from literature and impressions of prior experiences (Parker/Roffey 1997, p. 221). In order to assure the validity of the study, the complete interview guideline was pretested and discussed with two practitioners and three persons with a research background in the field of pricing and public services (Bortz/Döring 2006, p. 355f). As proposed by Grounded Theory, the interview guideline was constantly adapted to recent insights gained from prior interviews.

The interviews’ duration ranged between 65 and 170 minutes with an average of around 115 minutes per interview. 17 interviews were tape recorded and transcribed, only in three cases the researchers had to take notes during the interview process and to directly paraphrase the interviews afterwards. No names of interview partners are mentioned throughout this study, as privacy was assured to the participants.

The data was analyzed using an iterative approach following the Grounded Theory methodology. According to this approach, the processes of collecting and analyzing the data ran simultaneously (Glaser 1992, S. 16). For data analysis the researchers built over 2000 codes from the data collected. Following the Grounded Theory Methodology, the data analyzing process included open, axial and selective coding for being able to isolate key-categories at an abstract level (Kuckartz 2012, p. 66ff). Therefore the use of the software MAXQDA was helpful. During the process of data collection and analysis, memos helped to identify key-aspects and their interrelations.

4. Empirical Results

In this section results of this qualitative-empirical investigation among price auditors as well as organizational interview-partners are presented and analysed for creating structure of concerned companies and their problems during the process of public purchase. Therefore the first part structures the business environment in which price finding process for public purchase plays a dominant role. In the second part, organizational requirements that are necessary for the pricing process are analysed. In the third and fourth part of this section, results concerning the pricing process are focused.

4.1 Business Environment of price regulation for public purchase

Especially price auditors as interview partners could help to create an idea of what the business environment that falls under price regulation for public purchase looks like. By analysing the interviews concerning this topic, it becomes clear that the structure of companies that follow price regulation continuously to find prices for public orders especially consist of the defence industry as well as research and development (R&D) institutes. In some cases also locally public owned undertakings use price regulation norms, too. In other branches, price regulation norms are not an important instrument to generate prices for public orders.

The interview partners reported that the structure of public orders for which price audits come up is basically of a wide variety of goods and services. Price auditors distinguish between audits for industrial products and services. They underline a growing importance of service-contracts in the past decade. In general it becomes obvious that in the price audits concerning the regulation norms occur more frequently for military equipment, IT products and services as well as R&D services. Here because of a high level of specialization market mechanism seem to fail more often.
Concerning the asked price auditors, organizations that work for the public sector give a heterogeneous image concerning their size and the revenue they generate with a public contract partner in relation to the total revenue. Small companies with under a dozen employees as well as international enterprises work for public institutions. A high dependence on public contracts can be seen especially in R&D institutes as well as in local publicly owned undertakings. Also some highly specialized companies for military goods and services have relatively a high revenue-percentage with public orders compared to orders of private contract partners.

Dependent on the relevance of the public orders as well as on the size of the organizations cooperating with public purchasers, pricing for public orders as well as price audits are either organized as a part of management accounting with a few experts on these topics or as an own section that runs parallel to management accounting. The first can be mainly found in SME’s and companies where the revenue with public contract-partners has a small volume no matter if they are big or small. Whereas independent sections occur in companies that are highly dependent on orders of public institutions. In any case a close relation of pricing and price audits for public purchase with management accounting is obvious.

4.2 Operating requirements for the public purchase

In general, the qualitative-empirical investigation of this study identified three major requirements that are needed by companies to deal with the public procurement and pricing process adequately. First, there has to be an expertise about public procurement and pricing rules within the companies. Both, the asked price auditors and organizational interview-partners underline the importance of knowledge even before the public procurement process has started. This is necessary to be able to work formally to meet the conditions that come up later in the procurement and pricing process. Exact formal requirements are analysed in sections 4.3 and 4.4. Both groups report that problems especially occur when companies are audited the first time, because the majority has not anticipated the requirements during the procurement process because of missing expertise. By analysing the interviews it becomes obvious that while the majority of the companies have a certain expertise about public procurement, knowledge about pricing regulation is missing when the companies do not work off public orders constantly. Certainly pricing regulation leads to difficulties especially when market mechanisms fail.

Second, a permanent documentation of costs and revenues is needed to overcome the process of public pricing without deeper problems. Because the exact size of the price for a public order gets finally verified by a price audit, until then there exists uncertainty in the companies. That is the reason why it is not enough just to document the revenue and costs of an exact public order that is worked off. In fact it is absolutely necessary to document every revenue and costs that occur during the production of goods and services. Price auditors as well as organizational interview-partners report that especially when there is no expertise about price regulation rules or when contract partners assume conditions that are not conform with price regulation rules, (different) documents might have to be presented to price auditors for not coming into the situation to give a part of revenue back to the public purchaser. Because price audits mostly happen after the order is fully worked off, companies are surprised and unprepared for them. Surely the prerequisite of a permanent documentation is necessary in order to proceed with price audits. What exactly has to be documented will be shown in the following sections.

Third, pricing for public purchase requires a structured accounting system. Especially in case of cost-based pricing to meet the regulation norms (Leitsätze zur Selbstkostenpreisermittlung (LSP)) they have to be based on
financial accounting, but also on management accounting. While for example direct costs are valued based on the financial accounting standards, overhead cost calculations are part of management accounting. In practice, companies with a high percentage of public orders tend to organize their accounting system based on the calculation norms that is designated in the regulatory norms of cost-based pricing (LSP). Especially R&D institutions, local publically owned undertakings and some companies of the defence industry prefer this structure for being optimally prepared for price audits. On the other hand, in most cases companies that generate only a smaller percentage of their revenues with public orders, work with “bridge-calculations” to transfer the numbers of their accounting system into conformity with the cost-based pricing norms.

4.3 Identification of the adequate price-type

Especially price auditors who have a good overview of pricing practices for public orders report that every price-type can be found in practice. In practice, the “market-price” is the most common type, because it is the usual result of a procurement process where many companies bid for a public purchase. By bringing different offers together, a “synthetic” market is created that meets the requirements for a norm conform “market-price”. If there is only one bid or if there is no procurement in form of competitive bidding, companies can prove that the price for an order is a “market-price” by presenting documents that show that an equal product or service was already sold to another private contractual partner to the same amount of money.

By analysing the interviews it came up that difficulties for proofing a “market price” especially occur in 1) public owned undertakings, 2) companies that separated from their mother only to work off public purchase and 3) service companies. While local publically owned undertakings usually provide services like waste disposal or R&D institutes for which only public institutions give the order for, companies that separated from their mother only to work off public purchase report that they met the requirements for “market prices” before they were separated. Because they now only work off public orders, they do not have revenue with other private contract-partners so they do not meet the requirements for a law conform “market-price” any more even if they have obviously merchantable products or services. Interview-partners of service companies especially of the IT-branch report that price auditors refuse them to get a “market price” because of the individuality of their products that are adapted especially for the (public) customer. There is a discontent between price auditors and service companies in this case because while service companies see themselves in efficient markets, price auditors do not.

If contract partners agree to have cost-based pricing or if price auditors refuse “market prices” as the adequate price type, price regulation rules provide three price types on a cost-plus basis. First, a “fixed price” is certain before the public purchase is worked off by a company. Therefore costs have to be calculable in advance of the execution of the order. The interview-partners report that this is only the case if an equal product or service was already produced several times. The asked price auditors confirm that mostly industrial products fall under this category. Following them, “fixed prices” are preferred for large orders because politics can communicate a price that should not be exceeded later on. Nevertheless, price auditors report that for large contracts it is difficult to foresee planned costs transparently so prices are sometimes adapted by using add-on contracts.

Second, a “conversion-price” is the price type that is used when a company cannot oversee the costs at the beginning of a project but it is expected that at a certain time of the producing process they can oversee the costs of the whole project because they generated enough experience. So before the production process starts, a date is fixed
when the company has to have enough data about upcoming costs till the project is finished. The interview-partners report that this price type is used for large projects where there is not enough data to present a transparent plan of the expected costs at the beginning of the project. As a result of the interviews, this price type is least preferred by price auditors as well as by companies. The reason is a high administrative effort and a certain arbitrariness concerning the date for when the planned costs for the rest of the project have to be presented. Both groups of interview-partners assume that this price type is politically motivated. Large defence projects that include the development and production of military equipment are mentioned here.

Third, a “reimbursement-price” is not certain before the production process starts. Here, public institutions order products or services where the entrusted company cannot make any resilient cost plans. In these situations, the final price for the product or service is calculated when the production process has finished. During the production process, costs have to be documented in detail so that they can be charged. Organizational interview partners as well as price auditors report that the “reimbursement-price” is mostly used for individualized services like IT-services but also repairs etc. Concerning this point, there exists a controversy between the two interviewed groups. While organizational interview partners see a well doing and fast emerging market in services, price auditors do not. Because of their individual adaptation to the customer’s needs, the interviewed price auditors report that these services are not comparable most of the time, so the requirements of a norm-conform “market-price” are not fulfilled.

By analysing the interviews of this study concerning “price-types”, mainly two problems occur. The first problem concerns the definition especially of the “market-price” which is based on company subjective facts and which does not consider other forms of verification for existing markets for certain products or services.

The second problem is based on the price audit process. The correct “price-type” for public orders has to be ascertained by a price auditor. He is the one who irrevocably declares it. The consequence of this is that organizations are in uncertainty concerning the “price type” until a price auditor decided about it. Because of undercapacities price auditors report that it is common practice that the ascertainment of the adequate price-type lies sometimes after the order is worked off so that companies documented under a wrong assumption of a price type during their production process. As it is described in former sections, the different “price-types” require different documents. For a “market-price”, revenues of equal products are essential. For “fixed-prices”, planned costs have to be transparently presented, so former production processes with equal products or services create the basis of calculation for this “price-type”. On the other hand, “reimbursement-prices” require a documentation of actual cost for the public order. Documentations of former orders do not play any role for this “price-type”. Especially organizational interview partners report that problems occur when the price-type is 1) not ascertained before the production process starts or 2) when an assumed price-type is changed during price audits. In these cases companies might not document the information that is needed for the finally ascertained price type but for a different one. The interview partners of this study report that acting under the assumption of a different price type might have the consequence of not being able to charge a part of costs to the public purchaser. In practice this problem occurs especially for orders where first a “market-price” was assumed, then the production process started under this assumption and finally a “reimbursement-price” was ascertained.
4.4 Cost-based pricing practices

In this section, calculation practices are evaluated and critical aspects are worked out. By analysing the 20 semi-structured interviews of our study several inconsistencies within the actual calculation norms were identified. In this paper we focus on two essential structural discrepancies between the actual calculation norms and the requirements of today’s economy. First, actual calculation norms were basically introduced in 1953. Since then no adaptations to actual accounting standards have been made. Our interview partners report that hence therefore there are discrepancies because the financial accounting system is the main source of data for a cost-based calculation. Both systems used to be harmonized in that case but since there have been adaptations between financial accounting and taxation standards, generated numbers are not in accordance with calculation norms of pricing law (e.g. expected salary increases are now part of pension devices). Also price auditors suggested a reformation even if a harmonization would have higher prices as a consequence.

Second, actual calculation norms do not consider changing economic structure. During the last 60 years there has been a shift in economic structure from mainly industrial to a service oriented one. Calculation norms are still focused only on industrial production processes. Although, (knowledge based) service companies with highly specialized products do not use classical overhead cost accounting approaches to calculate their costs and prices. Activity based approaches are state of the art in modern research and practice but are hardly adaptable to cost-based calculation norms of pricing law. Furthermore we identified for calculating calculative interest for production relevant capital or benefit margins that are still recommended by commentary and used by price auditors.

5. Conclusion

In this paper we analyse the pricing process for public purchase. By using a grounded theoretical approach we investigate empirically who is concerned about this topic, how principles of pricing law are transferred into practice and which problems occur. Because of a close interrelation, it was necessary also to include public procurement in our study. To get a holistic overview of this poorly investigated field of research we provided 20 semi-structured interviews equally representing by price auditors and organizational interview partners. By our analysis we were able to develop an integrative model considering public procurement as well as pricing practices. However, our study also reveals many areas of research that need to be extended. In this section, we summarize our findings, give recommendations and comment on a few of the most promising streams for further research.

By considering previous studies and analysing our data, we identified defence and IT industry, research institutes as well as public-private-partnerships as especially concerned branches. Further descriptive studies are absolutely necessary to get detailed knowledge about the concerned branches, products, services and order volumes.

Based on our study, we identified three aspects that lead to problems in the actual system of pricing for public orders. First, the connection between public procurement and pricing law is not clearly defined. Both rules are independent but anyway in this study we identified a close interrelation. While public procurement is an instrument to find the most economical offer, pricing law is an instrument to verify if the price for the offer is appropriate. Public procurement is the first rule that has be executed by public purchaser and supplier. In fact, it refers to pricing law, but it is not clear at what point the connection starts. There has to be defined a concrete point of time in the process of public procurement, when a price-type has finally to be defined. In the actual system, only price auditors
have the competence to verify the final price type even after the production process has finished. In our opinion, this point of time needs to be before the company starts the production process for being able to document based on the price-type-specific requirements. Further normative studies are necessary to give advice how to solve this structural ambiguity.

Second, there is a serious lack of information about pricing law concerning public purchaser and also supplier. In the fact of good public procurement rules, pricing law has to be considered for every public order, but only few public purchaser respect it. Our study provides evidence that many public institutions disregard pricing law and/or do not inform suppliers about the duty to consider it for public orders. Certainly, also suppliers do not inform themselves adequately about requirements of pricing law. As a consequence this can lead to inadequate or missing documentation so that a “market-price” cannot be proved even if there exists an active market. Also, costs can only be reimbursed if their existence is documented based on the calculation norms. If companies are not informed about the documentation requirements they might not be able to add costs to the reimbursed cost-plus price. Because of a lack of (management) accounting expertise, especially SMEs seem to face differences here. By analysing the qualitative data of our study, there is a clear understanding that as the owner of the highest competence in pricing law, the ministry of economics with their price auditors is seen as in charge to distribute information about the duty to execute public orders under requirements of pricing law. As an instrument to guarantee appropriate prices for public purchase, this should also be on the tax payers’ behalf.

Third, the cost-plus calculation norms for cases where active markets cannot be proven are not up to date considering the status quo of the actual economy. The actual pricing law with its cost-plus price calculation approach does not consider modern accounting standards and seems to be still focused on industrial production processes. Especially for complex and highly specialized knowledge based services (e.g. of IT or R&D) these norms are hardly transferable. Here, classic cost accounting systems as provided by pricing law are mostly replaced by activity based approaches. Also the appreciation of idle time costs mainly determined by the degree of capacity utilization is totally different in services than in the industrial production processes. Furthermore the formula to calculate the benefit margin in defence contracts as well as the one in the calculative interest for production relevant capital provided in accompanying commentary indicate that also here revisions are necessary. Further empirical investigations as well as normative studies will be helpful and necessary to give further recommendations for a reformation of pricing law in Germany. International comparative studies are seen as valuable for integrating international best practices.

Practicable rules and procedures have to be implemented to enhance commitment to the regulatory system of public purchase and to support processes in the regulatory context.

6. Completed and further steps of this research project

So far completed project steps of the research project include a qualitative Status quo investigation concerning public procurement practices and cost-based pricing rules in Germany (VO PR 30/53) and their effects on company-internal processes. Analysis of existing constraints of public procurement and cost based pricing rules in Germany and the assessment of hypotheses as a basis for further (quantitative) investigations.
Anticipated further project steps are the identification and evaluation of the regulation system for public purchase in the United States of America (Public Procurement, Federal Acquisition Regulation (FAR), Defence Acquisition Regulation System (DARS)), the analysis of key aspects, organization and effects of the pricing rules for public acquisitions in the United States of America and the evaluation of the regulatory commitment and the practical relevance of the public procurement and cost-based price regulation system in the USA compared to the German system.

The examination of the public procurement process and the reflection of cost-oriented regulation systems in Germany and the United States of America are regarded as an essential part of the overall research project. The close relation and economic similarities between Germany and the United States of America as well as an advanced history of the United States of America in regulation can provide conclusive information for a best-practise regulatory design of price regulation for public acquisitions in Germany. The existing regulatory systems across sectors and borders should be the subject of a constant process of evaluation and development.

References


Systematic review of 16 years of scientific literature on public procurement

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As public procurement research is fragmented in many sub-topics, a clear synthesis is lacking, which in turn inhibits the establishment of a clear body of knowledge. To start filling this gap, this systematic review provides an overview of the most influential literature in the field of public procurement. The findings are aimed at providing other researchers with relevant information to synthesize existing findings.

We found that public procurement research is maturing, with increasing attention from diverse scientific disciplines. USA and UK are most productive publishers, while European countries have become increasingly active. Although a wide spectrum of research designs have been utilized, the reviewed articles focused on few. For example, although articles addressed twenty different topics, eleven were only studied once or twice, while 61.4% of papers researched the topic of procurement strategies. Considerable variations were observed across countries, indicating different research foci, as well as varying levels of maturity per research characteristic. Research seems to have underused existing scientific knowledge in that literature and meta-studies were only utilized in 13.2% and 5% of papers respectively. Practical applicability of research findings is inhibited by a detected imprecision of research, such as not specifying the procuring government level in 56.1% of reviewed papers. The overall conclusion with respect to the maturity level of public procurement research is that while various different paths have been laid, most researchers continued to walk the main roads. To develop the field further, we recommend to research the field from more diverse angles.

Introduction

Public procurement is a powerful tool to make governments more efficient. It accounts for 13% to 20% of worldwide GDP (OECD, 2013), meaning that a significant proportion of all produced products and services are bought by governments. Good public procurement policies and practices lower public expenditures and free them up to be allocated to other areas (Choi, 2010).

Many researchers emphasized the powerful effects that public procurement can have on fostering innovation (a.o. Aschhoff and Sofka, 2009; Edler and Georghiou, 2007) and green production (Day, 2005; Günther and Scheibe, 2006). To achieve such socially desirable outcomes, governments operate as both regulators, passing laws and regulations, and market participants (Choi, 2010; McCrudden, 2004). And in times of global supply chains public procurement is not only a means to improve upon social outcomes on domestic markets, but also internationally (McCrudden, 2004).

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While public procurement is a highly fragmented field, a systematic overview of research is still lacking. Crossan and Apaydin (2010) state that "fragmentation of the field prevents us from seeing the relations between these facets and ultimately impedes consolidation of the field." (p. 1154). By showing which topics have been addressed by research, to what extent, detecting possibly understudied, as well as mature sub-fields, and by enabling researchers with the tools to conduct syntheses on findings for sub-fields, the field is developed to a new state of more clarity and unification. The practical impact of this work is therefore indirect, by stimulating and enabling a research agenda to derive at generalizable findings.

This literature review provides an overview of the most influential scientific literature published on the topic of public procurement (PP). Moreover, the overall state of PP research is assessed, providing insights into the maturity of the field. According to Cheon, Grover and Sabherwal (1993) mature research fields are characterized by studying a variety of different topics and applying various research methods instead of narrowly focusing on few. Therefore, this review focuses on addressed topics, as well as employed methodologies and their development over time. The literature review is focused on the past sixteen years (1997 to 2012).

Methodology

The methodology was informed by Wynstra (2010). For reviewing the Journal of Purchasing and Supply Management’s publications of the years 1994 to 2009 he developed an extensive list of categories each article was classified into. The main categories employed by Wynstra are: topic, research strategy, data collection, data analysis, type of product, type of purchase, as well industry and sector. With respect to the topics, the author classified each article into a maximum of three subject categories, while another, similar review conducted by Carter and Ellram (2003) on the Journal of Supply Chain Management categorized each article into only one subject category which summarized the article's focus the best. We believe that Wynstra's approach yields a more accurate representation of research topics, since procurement subjects are often researched against a clear background and therefore categorization into only one subject field will under-represent the other(s).

Each of the main categories was further divided by Wynstra into sub-categories. He also gathered general article data including publication year, contributing authors, institutions and citations.

All main categories employed in his research were adopted with the exception of "type of purchase", as a scoping study of the PP field had revealed that this category was irrelevant. While the main categories were mostly adopted, the sub-categories were modified. His topic sub-categories were to a great extent not applicable to this review, since his research mainly focused on private sector procurements. The research strategies were all adopted except for "expert interviews/Focus group" and "laboratory experiment", which were instead grouped as data collection methods. Wynstra's subcategories for data collection are very specific, such as distinguishing between four kinds of questionnaires. As this level of specificity may falsely create the impression of variety, the subcategories were simplified. The same applies to his thirty-nine items list of data analysis techniques, which was simplified to only distinguish between quantitative and qualitative research. The product types were amended to account for works while the product type combination "good/service" was omitted. Nine industry and sector categories were adopted from the Wynstra classification scheme yet further extended during the data extraction stage of the review. Instead of collecting institute data, the country of the institute was noted per article. While institutional data would have provided interesting insights into institutional collaborations, as well as most active institutions on the field, this review adopted a global perspective limited to cross-country as opposed
to cross-institutional differences. Finally, his categorizations were extended with data on studied country/ies, publishing journal and the procuring government level. This latter study characteristic is specific to public procurement and inclusion in the review provided valuable information on the context of conducted research. Specifying the research context is according to Denyer, Tranfield and van Aken (2008) supportive to practical relevance. The complete classification scheme may be obtained from the authors upon request. The classification scheme was directly transcribed into an SPSS data extraction form, which was later used to conduct the analyses.

The review's objective was to assess the overall status development of public procurement research, its predominant study characteristics and research designs, as well as addressed topics. The status of public procurement research was operationalized as annual publications. Publication counts are an effective outcome measure to assess the scientific importance of a research field (Crossan and Apaydin, 2010) and their development is a reliable indication whether the relevance of the field changed. To further characterize the time developments, publishing countries and journals were assessed over time as well as authorships. It is believed that these variables provide a meaningful overview of the main stakeholders of the field.

Predominant study characteristics were assessed against the industries and sectors from which the government procures, the procuring government level, studied country/ies and types of products procured. There was no limitation for those categories with regard to maximum sub-categories per article.

Most frequently employed research strategies were assessed against the research methodology, time dimension, research strategy and data collection methods. While there was no limit as to how many data collection methods each article was grouped into, the other categories held mutually exclusive sub-categories. This exclusiveness was only breached when articles clearly articulated to have utilized more than one strategy.

To detect developments over time, the sixteen years of research have been subdivided into equal time intervals of four years each, inspired by Wynstra (2010) and Carter and Ellram (2003).

Searches were conducted by use of the databases Scopus and Web of Science. Both databases are well-established, multi-disciplinary research platforms, holding a wide variety of peer-reviewed journals, and they are being kept up to date. We chose for two databases to ensure all relevant papers are included, since it is possible that one database omits relevant research (Crossan and Apaydin, 2010).

To assess whether high impact papers differ from low and medium impact publications with regard to study characteristics and research designs we conducted citation analyses based on mean scores of the Scopus and Web of Science citation counts. We included both databases' citation counts as citations differ per database and therefore reliance on only one source may over- or undervalue individual papers. A mean citation count is believed to provide a more realistic assessment of each paper’s scientific impact. Also, not every paper is enlisted in both databases, therefore considering only one of them could mean that some papers could not be assigned an impact assessor although they may be of value to research. A shortcoming of citation analysis is that recent papers have had less time to accumulate citations. However, one paper from 2010 is still the twenty-first most often cited paper overall, and the third most cited article in its research sub-field. Therefore, it is believed that, while acknowledging the discrimination against recent papers, research with high relevance to science will have gathered notable citations in the past least one year (status March 2014).

Searches were limited to English articles, published in peer-reviewed journals. While some authors have critiqued peer-review to be an obscure process (Altman, 1996), potentially biased by knowing
the identity of the author (Relman, 1990), the limitations of this research did not allow for a quality appraisal of each included article. Therefore, it is believed that peer-review was the best available measure to have some quality appraisal in place. It is assumed that high impact research on the subject of public procurement will have been translated into English and that therefore no high impact papers have been disregarded from the review based on the language restriction.

The time frame chosen for this systematic review are the years between January 1, 1997 and December 31, 2012. Around the millennium a number of initiatives have been launched by the National Institute of Governmental Purchasing, Inc. (NIGP) to foster academia to pay more attention to the largely neglected field of public procurement (Thai, 2001; Carter and Grimm, 2001). Those included, beyond others, under a partnership agreement with the Florida Atlantic University (FAU) the establishment of the Public Procurement Research Center, as well as the launch of the first scholarly journal on the field, the Journal of Public Procurement. We decided on setting the cut-off year for this review a few years before the launch of those initiatives to, among other things, be able to assess their impact on the field. The final year of consideration, 2012, was the most current research year when this systematic review was initiated in 2013 and was thus chosen to represent the most recent developments.

Search terms were developed by testing individual term’s effectiveness against batches of twenty search results. After the test batches had revealed many terms to be ineffective in that they did not add any new or relevant results, the following are the final search terms utilized in combination.

- Variations of public: public; government
- Variations of procurement: procurement; purchasing; contracting; buying; commissioning

For the database Scopus, searches for the search terms was restricted to title, abstract and keywords of the article. The proximity operator of W/5 was included between two consecutive search terms to include results where the two search terms appear within five words. Scopus advises researchers to use a proximity operator of either 3, 4 or 5, if they wished to find the search terms within phrases (Scopus, n.d). To lower the threat of falsely omitting relevant literature, we utilized the widest of the advised proximity operators. For the Web of Science database searches were restricted to the topic subject and title. In line with the Scopus searches, the proximity operator NEAR/5 was used.

For the Scopus database searches were restricted to the subject area of Social Sciences & Humanities. For the Web of Science database searches were restricted to the subject areas Science Citation Index Expanded and Social Sciences Citation Index.

Search results were assessed for relevance in a three-step process based on Bettany-Saltikov (2010) by comparing title, abstract and the full text against stipulated criteria for in- and exclusion. The main rationale was that we only wanted to include articles that were strictly on the topic of public procurement and which provided exemplars of current practices, best or worst, as well as guidelines for practice and research. The criteria may be requested from the authors.

Relevance assessments were partly conducted in a team of four. The other three researchers could not finish all batches due to personal agendas that no longer allowed for the time intensive effort. As a result, the title assessment was fully conducted in a team, while the abstract assessment was only partly conducted in a team, and the final full text assessment was conducted by the main author alone.
The remaining 378 articles were then coded against eleven main categories and subsequently analyzed by means of descriptive statistics using the software SPSS.

Findings and discussion

This review analyzed the status of public procurement research and how it developed globally between the years 1997 and 2012. We found that the relevance of the field, assessed by annual publications, increased significantly over the years, a raise which began in 2003 (Figure 1). High individual authors, who only published one or two articles, as well as the fact that 199 different journals were the publishers of the 378 articles included in this review, highlight that public procurement is no isolated research field, but instead highly cross-disciplinary.

The majority of journals, 68.5%, published only one article over the sixteen years, and a further 14.5% published two. Even the top ten publishing journals each account for a maximum of 3.7% of all papers included in this review (Table 2) and they often published merely one or two relevant articles within four year intervals. Due to the high requirements of the chosen databases, the Journal of Public Procurement is not listed in the Web of Science database, while Scopus only lists publications from 2012 onwards. Yet, in this final year the journal published eight relevant articles, making it the overall fourth most productive publisher and the most knowledgeable on the field of public procurement research.

Forty-eight countries published relevant articles, while eighty-five were studied. While this poses to variation, our analyses revealed that most influential countries, both publishing as - due to a strong home bias of researchers - studied, are mainly the USA and UK, while all other countries have very low relative shares. Yet, the importance of the top publishers decreased greatly as more countries entered the field over the course of time. Especially European countries have rapidly increased their research activities in the later years. If this trend is continued, they could become more knowledgeable on the field and PP research could mature to a state where phenomena are studied against more versatile backgrounds.

PP research is highly practice oriented, which manifests itself both through employed research strategies, which were mostly case studies and survey researches (Figure 2), as through utilized data sources, of which reviews of non-academic literature and survey methods were most prominent (Figure 3). Shortcomings of these trends refer, paradoxically, to practical relevance as all those measures have limited reliability and their findings are difficult to generalize. The mostly neglected measures to pool findings (meta-analyses) or apply them to further analyses (literature studies) disable the field from deriving at definite findings, which can be applied by practitioners.

Figure 1 Publication trend
What further inhibits practical application is that research was very unspecific with respect to context variables: 56.1% of papers did not specify a government level, 28.6% no product, and 60.6% of articles were grouped into the pooled categories of unspecified industries and sectors from which the public procures. Moreover, 20.6% of papers did not specify their data sources, which poses to dubious scientificity as findings cannot be verified by others.

The field addressed a wide range of twenty different topics, including nine that were only studied once to twice and which were grouped into a pooled category entitled “Other topic”. However, topics have been addressed by uneven proportions of papers: while the top studied topic of procurement strategies was studied in 61.4% of papers, the second most prominent topic, selection, was merely studied by 17.2% of the articles. Even more so, other topics’ relevance decreased over time, while procurement strategies’ continued to grow (Figure 4).

Of the twenty different procurement strategies addressed, research mainly focused on contracting-out and PPP, which combined were studied in 64.2% of strategy papers.

This apparent, yet fallacious, versatility was also observed for studied industrial and sectoral contexts: while thirty-two different industries and sectors were studied, research mainly focused on the construction industry, studied in 20.6% of papers, while the second most often studied sector, the health sector, was only studied by 6.9% (Figure 5).

The review concentrated on discovering prominent research designs and study characteristics. Overall, services were the most often studied product type, although over time their proportionate relevance decreased as particularly works became increasingly popular.
The most frequently studied government level is the local one. Over the sixteen years, the municipal level was researched increasingly more often, while the federal level slightly decreased in scientific relevance. Whereas during the years 1997 and 2008 the majority of articles conducted quantitative research, qualitative methods gained more attention in the final four years, resulting in both methodologies being applied almost equally often. This achieved status is a sign of maturity in that no method is under- nor overused. With respect to time dimension it was shown that PP research was focused on cross-sectional research, applied by 79.6% of reviewed articles, which inhibits generalizability of findings (Babbie, 2006).

While on the global level overall favorites per research variable could be detected, cross-country, as well as cross-topic comparisons showed great variations. Research on the strategy of e-procurement showed noticeable limitations in that it was only assessed by means of survey research and case studies, while fifteen of the sixteen papers on the topic did not specify the private industry or sector from which the public procures. Utilizing the full spectrum of research strategies increases generalizability of findings. Furthermore, contextualization is paramount for evidence-based management, as it also enables other researchers to assess reasons for potentially contradicting findings.

High impact papers did not show differences to low impact papers with respect to contextual imprecision. A noticeable distinctiveness observed is that while low and medium impact papers focused on the more practice oriented research strategies of case studies and survey
research, while mostly neglecting literature studies and meta-studies, the high impact papers exclusively relied on the latter strategies as well as on survey research. This shows that high impact research utilized existing, scientific knowledge, which is important in developing the PP field to maturity.

The overall conclusion with respect to the maturity level of PP research is that while various different paths have been laid, researchers continued to walk the main roads. To develop the field further, researchers are strongly advised to research the field from more diverse angles. The data provided in the full review can provide them with the needed information as to which designs have been underused until today. Moreover, scientists should synthesize past findings for the sake of deriving at definite conclusions. Only when research findings are tested against various backgrounds and when past findings are validated, can definite findings be developed, which can eventually be consulted by practitioners.

**Review limitations**

A limitation of this review is that the categorizations of all included articles were done by the main author alone. To make the findings objective, systematic literature reviews should be conducted.
within a team of researchers (Tranfield, Denyer and Smart, 2003; Rousseau, Manning and Denyer, 2008). As this limitation was known at the beginning of the research project, this paper aimed at making the review process highly transparent to enable other researchers to replicate the work and test the findings.

A further limitation regards the exclusion of articles published in other languages than English, which may have yielded a language bias (Egger et al., 1997).

Restricting the search for relevant papers to only two databases may have omitted relevant papers, since even the renowned databases Scopus and Web of Science do not hold all relevant articles. This apprehension was confirmed by the fact that ten years of publications from the Journal of Public Procurement were missed because the journal was rejected by Thomson Reuters, and only accepted by Elsevier in 2012.

It is generally considered important to include grey literature in a systematic literature review to develop a more complete overview (Tranfield et al., 2003; Rousseau et al., 2008; Hopewell, McDonald, Clarke and Egger, 2007). Grey literature refers to "multiple document types produced on all levels of government, academics, business, and organization in electronic and print formats not controlled by commercial publishing i.e. where publishing is not the primary activity of the producing body." (GreyNet International, n.d.). Due to its nature, grey literature is difficult to locate and can be abundant, which would have exceeded the time range of this review. Moreover, this type of literature does not satisfy the research aim of presenting an overview of only the most influential scientific literature. According to Davies (2000) publication bias may adversely affect the validity of findings as journals tend to favour publishing positive results.

Directions for future research

To address this review's limitations, other researchers are encouraged to replicate the work to test the findings. Full replications should take account of the limitations of this review.

While the review provides a detailed overview of researched topics and the designs applied to study them, researchers should take these findings into account when designing upcoming studies. To increase versatility and increase generalizability of findings, subjects should be assessed against different backgrounds and by different means. As shown in the topic analyses, increase in versatility is especially needed for research on e-procurement, which was approached highly limited in the past.

While this systematic literature review concentrated upon cross-country differences, it would be interesting to detect most active institutions on the field, as well as inter-institutional collaborations.

The high amount of 199 individual journals publishing relevant research may be analyzed with regard to most prominent backgrounds to detect which scientific fields are the main stakeholders of PP research.

This review does not include an analysis of most relevant topics per publishing country. Since public procurement practices are embedded in local system contexts, such analyses may provide interesting insights as to how PP research foci differ globally.

The citation analysis conducted in this review was limited to citations of Scopus and Web of Science. As PP is very practice oriented, it is likely that paper impacts differ when non-scientific citations are included. Such analysis could provide valuable insights into the potential differences in topics' relevance to practitioners. Potentially observed differences could then inform future research topics, which would both make the field more diverse, as it would also increase practical relevance.
Finally, replication of this review in a few years’ time is encouraged to assess how the field developed after 2012. Since recent trends have been observed, such as the study of more diverse industries and sectors in the later time intervals and an increasing relevance of European publishers, the research field may appear quite different in the years after 2012.
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Auditing Public Procurement: Roles of the Office of the Auditor General of Thailand in ensuring Transparency and Accountability in Public Procurement

Sutthi Suntharanurak

Abstract

Supreme Audit Institution (SAI) is one of the most important pillars of good governance and anti-corruption agencies. SAI could enhance transparency and accountability in public procurement. Transparency and Accountability are the main characteristics of good governance. In 1977, the Lima Declaration was intended to provide criteria to ensure independence and effective of government auditing. This document showed that the government auditing could play the important role in enhancing transparency and accountability in public financial management.

Presently, the auditing public procurement is another type of audit of Office of the Auditor General of Thailand (OAG). Under compliance audit, the main audit objective is to ensure that the procurement process of goods and services including public works have been followed the public procurement law and regulations. It is essential to check whether public procurement is made through transparency processes, supporting competitive public procurement market and obtaining values for money. For OAG Thailand, the auditing public procurement consists of three phases. The first phase is the audit of preparation of procurement plan. Next phase, the auditor will review the tendering and awarding processes. For the last phase, the auditor will examine the execution of public procurement contract. Under the State Audit Act, the audit report and recommendation will be submitted to the audit entity in order to improve its procurement management. However, many irregularities cases were submitted to anti-corruption agencies because these cases might be related to corruption in public procurement. Many previous audit findings will be revised for developing measure of transparency and accountability in public procurement system. Additionally, OAG Thailand still plays another role to improve transparency by publishing main detail of contracts of audit entities through OAG website. This paper attempts to analyze how OAG Thailand contributes to ensure transparency and accountability in public procurement.

Keywords: Supreme Audit Institution, Auditing public procurement, Office of the Auditor General of Thailand

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1. Introduction

Each year Thai government spends a large share of taxpayers’ money through public procurement—purchasing goods and services ranging from stationery, military weaponry, medicine, road construction, and so on. For this reason, the Office of the Auditor General of Thailand (OAG) emphasizes on the auditing public procurement to ensure transparency and accountability exists at all stages of the procurement procedures. This paper will discuss the role of OAG Thailand in public procurement through the audit of public procurement. The author attempts to explain how OAG Thailand contributes to enhance good governance in public procurement. This paper is consisted of four parts which the next part will summarize briefly about background of public procurement in Thailand. For the third part, the author will clarify the auditing public procurement of OAG Thailand which reflected the role of Supreme Audit Institution (SAI) in enhancing transparency and accountability in public financial management. However, the final part will be conclusion and looking forward to improve the auditing public procurement under values for money audit.

2. Background of Public Procurement in Thailand: Legal Framework

The main legislation about public procurement in Thailand is the Regulation of the Office of the Prime Minister on Procurement and its amendment (ROPMP) of 1992. Chulasingh Vasantasingh (2008: 39) noted that this regulation has been revised to be in line with the public procurement of the UN Commission on International Trade Law (UNCITRAL). Also it was based on the basic principles of proper procedures which ensured fairness, prudence, transparency and accountability. However, the Thai government has established a central procurement agency called the “Office of Procurement Management” or OPM in the Comptroller General’s Department (CGD) within the Ministry of Finance. The duty of the OPM is to supervise or consult the individual procuring entities, monitor compliance with the regulatory framework, set and harmonize procurement policy, as well as recommend reforms. Since 1992 the government has set the Committee in Charge of Procurement (CCP) to interpret the ROPMP, make recommendations concerning its enforcement and amendment, grant exemptions from the ROPMP to procuring agencies, and hear complaints. Further, Thailand’s law, regulations, and policy guidelines on public procurement are published in the Royal Gazette. Also they are posted on the websites of the Ministry of Finance.
Under the ROPMP, the procurement methods depend on several factors including the value of the contract, the nature of the goods and services, and the urgency of the procurement. However, since 2005 procurement valued at above 2 million baht has had to be conducted through an electronic auction (e-auction). In the procurement process, the procuring agency must publish the criteria of prequalification and method of selection. The publication of procurement opportunities increases bidding participation, also consequently reduce the risk of collusion or bid rigging in the procurement process.

Generally, all procuring agencies must announce their procurements on the Governments’ central procurement website (www.gprocurement.go.th) and relevant agencies’ websites. Additionally, they must make these announcements to the Mass Communication Authority of Thailand, the Broadcasting Authority, and the Office of the Auditor General of Thailand. Hence, clear definitions of the criteria and procedures for bid selection are the important factors in reducing corruption in the procurement process. (Chulasingh Vasantasingh, 2008: 41) Normally, the ROPMP provides general selection criteria, namely, price, bidder’s qualification, and quality. The selection committees are responsible for evaluating and selecting the lowest bidder. The lowest bidder under government criteria will be announced on the website of the procuring agency and finally a contract is signed as “contractor” of the government agencies involved.

After post-procurement processes, the ROPMP provides the principles of public contract management, for example, the Material Inspection and Acceptance Committee is in charge of inspecting the fulfillment of the procurement contract, in term of quality and quantity of goods and services.

3. Auditing Public Procurement of OAG Thailand: Compliance or Performance Audits

In the past, SAIs attempted to audit public contracts especially the auditing public works which mentioned to section 21 of the Lima Declaration in 1977. The Lima Declaration (1977) defined the guidelines on auditing precepts which should be implemented in each country. This declaration contains a comprehensive list of all goals and issues relating to government auditing particularly the independence of SAIs. Additionally, it was intended to provide criteria to ensure independence and effectiveness of government auditing. This

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2 Presently, Lima Declaration (1977) is adapted to the first International Standards of Supreme Audit Institutions or ISSAI 1 which stated the basic prerequisites for the proper functioning and professional conduct of Supreme Audit Institutions and the fundamental principles in auditing of public entities. This guideline consists of seven principles, i.e., (1) purpose and types of audits, (2) independence of SAIs and its members, (3) relationship to parliament-government and the administration, (4) powers of SAIs, (5) audit methods, audit staff, international exchange of experiences, (6) reporting, and (7) audit power of SAIs.
document shows that the government auditing could play the important role in enhancing transparency and accountability in public financial management.

At the beginning era, the audit powers of SAIs related to the public procurement in the auditing public contracts. However, it mentioned to the audits of public tendering especially the competitive issue. Particularly, it emphasized on the auditing public works.

<table>
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<th>Box-1 Section 21 of Lima Declaration (1977)</th>
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<td>1. The considerable funds expended by public authorities on contracts and public works justify a particularly exhaustive audit of the funds used.</td>
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<td>2. Public tendering is the most suitable procedure for obtaining the most favorable offer in terms of price and quality. Whenever public tenders are not invited, the Supreme Audit Institution shall determine the reasons.</td>
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<tr>
<td>3. When auditing public works, the Supreme Audit Institution shall promote the development of suitable standards for regulating the administration of such works.</td>
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<tr>
<td>4. Audits of public works shall cover not only the regularity of payments, but also the efficiency of construction management and the quality of construction work.</td>
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In box 1, it shows the section 21 of Lima Declaration (1977) which explains the basic concept of auditing public procurement. However, this concept is developed to the audit guideline in public procurement, for example, the audit of public works which performed by the Board of Audit of Japan (BOJ). Under the viewpoints of compliance, economy, efficiency, and effectiveness, the BOJ will examine the appropriateness of public work project at each stage as following: planning, design, cost estimation, bidding, contract, construction, and inspection and receipt of the completed work. Meanwhile, in Germany Bundersrechunungshof (BRH) or SAI of Germany performs the auditing public procurement as a routine exercise. Werner Pelzer (2010) concluded that the audit approach of BRH in public procurement is designed to verify whether there is an actual need for the particular procurement. From a legal point of view, the auditor will check that the procedure has been conducted in accordance with public procurement regulations. In addition, the auditor attempts to prove whether the result of the procurement procedure achieves values for money. Therefore, the auditing public procurement in Germany seeks to ensure regularity as well as good performance. In practices, the BRH will identify subject matter and scope of audit in public procurement by using budget plan, procurement statistics, and contracts also complaints, evidences and petitions from the third persons.
Hence, the auditing public procurement is based on audit approach in both regularity auditing and performance auditing. Normally, the regularity auditing is consisted of the financial and compliance auditing. The main objective of regularity auditing is to verify that the procurement processes has been conducted under public procurement laws and regulation. Presently, some SAIs still carries out the auditing public procurement under this approach such as the Office of the Comptroller and Auditor General of Bangladesh, and OAG Thailand. Meanwhile, many SAIs attempt to implement the performance auditing approach for verifying that the result of the procurement process promotes values of money. For example, National Audit Office of United Kingdom (NAO, UK) examined the improving public procurement of UK government by using the values for money audit. The NAO audit report showed that there have been problems in implementing the procurement reforms such as ineffective governance structures, unrealistic targets, incomplete data, and weaknesses in the management of the central contracts. These problems might affect to the values for money in public procurement reforms.

For OAG Thailand, the auditing public procurement is a main audit type which OAG establishes the direct department for public procurement auditing. According to the Notification of State Audit Commission about setting organizational structure and duties in Office of the Auditor General of Thailand B.E. 2555 (2012), in headquarter office there are five procurement audit units or known as Procurement and Investigative Offices 1-5. These offices perform public procurement auditing and investigative auditing. In addition, in regional audit offices there are 15 procurement and investigative auditing units or known as Regional Special Audit Offices 1-15 distributed across the country.

However, the auditing public procurement is still based on the compliance auditing. The main objective of auditing public procurement is to ensure that the procurement process of goods and services including public works have been conducted the public procurement law and regulations. Under OAG audit mandate\(^3\), it is necessary to verify whether the public procurement procedures are made through three perspectives (1) transparency processes, (2) supporting competitive public procurement market and (3) obtaining values for money.

\(^3\text{Under the Organic Act on State Audit B.E. 2542 (1999) or the state audit act of Thailand, OAG will conduct the state audit, for example, to audit receipt and payment, the retention, and disbursement of money and other properties belonging to or being within the responsibility of the audited agency and give opinions as to whether it is in compliance with the laws, rules, regulations or resolutions of the Council of Ministers, and to, as it wishes, audit the disbursement of money and use of other properties or the procurement under a given plan, work or project of an audited agency and give opinions as to whether they are in compliance with the objectives, economical, worthwhile and achieve their goals.}\)
However, the third perspective as obtaining values for money seems to be ultimate goal which the compliance auditing method could not attain this goal.

Presently, the public procurement auditing of OAG consisted of three phases as following:

1) Audit of preparation of procurement plan;
2) Audit of tendering and awarding processes;
3) Audit of contract management.

In the first phase, the public procurement auditor will check the preparation of procurement plan under the Notification of State Audit Commission about making preparation of procurement plan of audit entities B.E. 2546 (2003). The objective of this notification is to enhance the good governance in the procurement system of audit entities. The notification determines that all audit entities have to make the preparation of procurement plan and submit to OAG in order to review this document. The main content of procurement plan is consisted of category of procuring items, value of good & services and public works (more than 100,000 Bath for goods & services and 2 million Bath for land purchasing& public works), selecting procurement method, expected date of bidding process, expected of signing contract, and expected payment plan.

Under this notification, the auditor will receive the procurement plan during the first month of fiscal year which in Thailand commenced on October. Therefore, the auditor could check the procurement needs from procurement plan of audit entities. In particular, the important projects as mega projects must be appeared in the procurement plan, thus, the auditor could utilize these information to prepare audit plan in the next phase.

In the second phase, OAG will examine the accuracy of the tendering and awarding processes. In this phase, OAG plays the key role obviously especially enhancing transparency and accountability. According to the Regulation of the Office of the Prime Minister on Procurement and its amendment (ROPMP) of 1992, it determines that procuring agency has to advertise its procurement in the website: www.gprocurement.go.th, and notify to five public agencies including OAG Thailand. Similarly, the ROMP issues that the procuring agency must submit awarding contracts which over than 1 million Baht to OAG. Therefore, the audit mandate of OAG is existed in the public procurement regulation which allows OAG
to carry out a procurement audit under transparency and accountability of tendering and awarding processes.

Generally, the public procurement auditor will examine all documents in procurement procedures. Initially, the auditor will check main processes as followings.

(1) The identification of needs should be clarified in the request procurement report of procuring agency. In particular, obvious specification of procuring items should be broad and open for competition.

(2) The bidding documents\(^4\) should clearly define the bid evaluation criteria. Also adequate publicity and time have been allowed for the prospective bidders to respond.

(3) The bidding documents should obviously describe the form of bid under the standard bidding documents of ROMP.

(4) The bidding documents have to be accurately and clearly about the work, location, procuring items, plan and schedule of delivery and installation.

(5) Bidding process must be disclosure to the public under concept of transparency, fairness, non discrimination, and competitive procurement market.

(6) The estimated cost should be reasonable prices beneficial to the government.

(7) The evaluation committee must be qualified and does not include anyone with a personal interest in the contract. In other words, the auditor will examine the conflict of interest behavior in public procurement.

(8) The criteria and methodology for selection of awarding bidder should be accordance with the bidding documents.

(9) The decisions and reasons of all evaluation committees have to be recorded and could notify to the third persons clearly. Under the principle of bid evaluation, the evaluation procedure will be confidential.

(10) Terms and conditions of contract have to be the same in the invitation bidding stage.

\(^4\) Generally, the bidding documents are included (1) invitation for bid, (2) instructions to bidders, (3) form of bid, (4) form of contract, (5) general and specific conditions of contract, (6) design and drawings and specifications, (7) list of goods or bill of quantities (BOQ), (8) delivery time or schedule of completion, (9) sample form of securities guarantees, (10) publication of notice, and (11) information to agent.
For the third phase, it is the audit of contract management which the main objective is to examine the execution of public procurement contract. For example, the auditor will examine whether delivery of goods is different from the one specified in the identification of needs. Further, the auditor could review the extension of time of supply of goods, equipment, and public works construction which should be completed within the time in contract. Likewise, in case of price adjustment the auditor should also be careful in the audit of payment escalation under reasonable price.

However, when OAG found audit findings from the auditing public procurement, OAG will submit these cases to the State Audit Commission (SACs)\(^5\) in order to decide on the audit cases. The audit report will be rendered to the parliament, council of ministers and audit agency. It is also publicly available. In case of any resistance by the audit agency, SACs will report the irregularity cases to the higher authority supervising that audit agencies. Additionally, if the audit decision is relevant to the penal offences and believable corruption in public procurement, SACs will submit these cases to anti-corruption agencies like the Royal Thai Police and the National Anti-Corruption Commissions (NACC).

Nowadays, in order to support principles of transparency and citizen engagement, OAG provides the database of audit entities in awarding of contract which all audit entities have to submit copy of contract to OAG\(^6\). This database, known as Public Procurement Watch with OAG, will show contract information as contract value and name of contractor through [http://procurement-oag.in.th/](http://procurement-oag.in.th/).

For the benefit of database, our auditors or researchers could analyze the condition of public procurement market by using this database. The OAG auditors could evaluate whether procurement market of auditee is competitive or not. Likewise, academic researchers or civil society could access the fundamental information of contract which they could monitor public expenditure more closely.

In addition, many audit findings in public procurement audit will be revised for developing measure of transparency and accountability in public procurement system. For

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\(^5\) The State Audit Commission (SAC) is appeared in the chapter XI Part 1 (Independent Organ under Constitution: Article 252-254) of the Constitution of the Kingdom of Thailand B.E. 2550 (2007). In article 253, it is mentioned that the State Audit Commission has the powers and duties to prescribe the standards and rules for state audit, advice, recommend and propose the remedial measure on state audit.

\(^6\) The Regulation of the Prime Minister on Procurement 1992, the procurement law of Thailand, determines that all government agencies have to submit copy of contract which valued more than 1 million baht to OAG within 30 days after signed contract.
example, in 2005 OAG proposed the *Measure of State audit about public procurement of Sub district Administrative Organizations (SAOs)*\(^7\) which this measure explains good practices in each procurement stage of SAOs.

4. Conclusion: Looking forward to improve auditing public procurement in Thailand

The auditing public procurement is one of the important instruments of OAG to enhance transparency and accountability in public procurement in Thailand. OAG has been powered to carry out the public procurement auditing in regards of legality and value for money. Hence, the auditing public procurement could encourage the integrity of the procurement system, and reduce the risk of corruption in public procurement.

However, the auditing public procurement of OAG is still based on the approach of compliance auditing which could verify only the following procurement laws and regulation. The compliance auditing may not answer the question about values for money which the performance auditing could explain this point.

Presently, many SAIs in Europe improve the auditing public procurement by using only the approach of performance auditing, for example, National Audit Offices in UK, Denmark, and Finland. Meanwhile, some SAIs utilizes both the compliance and performance auditing in public procurement such as Tribunal de Contas (Portugal), Bundesrechnungshof (Germany), and the Spanish Court of Audit (Spain). Interestingly, many SAIs in Europe have attempted to improve the model for public procurement auditing as known as *Procurement Performance Model*.

The procurement performance model develops key questions as reference pointers for auditors evaluating the performance of the procurement function of the audit entities. It sets the assessment of public procurement in three levels as following: (1) the meta level will assess the government overall procurement strategy; (2) the macro level will assess the department’s procurement function unit; and (3) the micro level will assess a single procurement project.

Therefore, the auditing public procurement of OAG could ensure the transparency and accountability in public procurement; however, OAG Thailand could improve the method in

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\(^7\)The Sub-district Administrative Organization (SAO) is another type of local government in Thailand which presently the number of SAOs is more than 7,500 SAOs across the country.
procurement audit by looking forward to the performance auditing in order to obtain the values for money in public procurement.

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Rationalising public procurement of complex construction projects by the price component selection

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ABSTRACT. The problems related to the traditional project procurement method are known to often lead to adversarial relations especially in the case of competitive fixed-price contracts and complex projects. Neither does the traditional, sequential involvement of the parties allow mutual exchange of information and collaboration for the benefit of the project. Therefore, early involvement of the construction team is increasingly utilised in demanding projects to incorporate versatile expertise in their planning. Often the solution is to strive for an open process where the price (target cost) of the project is set later after a joint development phase by the owner and the selected team involved. Such a process poses, however, a challenge to public owners due to public accountability concerns. This study tries to respond to this challenge by exploring the possibilities of awarding a contract based on capability and mere key price components combined with specific cost management methods to ensure the economic efficiency of a project. This is done by delving into the practices and experiences of four different infrastructure construction projects. The price components used in those four projects consisted of, for instance, fee, project overhead, risk and opportunity provision, preliminaries and direct costs of a certain part of the project; these items do not cover the total project price leaving part of the project unpriced in the selection phase. On the whole, the experiences from case projects have been positive and they also encourage considering the possibility of using the price component method more extensively in challenging future public sector projects.

Keywords: price component selection, partial price selection, project alliance, infrastructure, construction

Introduction

It has long been the custom in construction to select service providers, especially contractors, solely on the basis of the lowest bid. The practice has led to risk taking and adversarial relations and created problems in the sector thereby impeding its development. Pressures to renew the implementer selection come also from a broader cultural change: a value-added strategy is now being pursued also in construction and more collaborative, relational project practices are increasingly applied in various forms (see, e.g. [1]). A collaborative approach often also means early involvement of the key parties to the process since traditional, sequential involvement of the parties does not allow mutual exchange of information and collaboration for the benefit of the project. Therefore, early involvement of the construction team is increasingly utilised especially in demanding projects to incorporate versatile expertise in their planning. Early involvement has also become part of governments’ strategies [2–5].

At an early stage, the project is fraught with too much uncertainty which makes it impossible to estimate (all) costs reliably. Due to the resulting risk premiums, it is not sensible to fix the price in the early stages of project development. On the other hand, procurement methods involving competitors in early proposal design (for complete design and full price) forego the opportunity of collaboration with the client (owner) and stakeholders. Even if competitive ideas are presented, the owner’s decision making can be conservative and ignore possible improvements since evaluation of alternative solution and ensuring the absence of gimmicks is often impossible in the middle of a hectic process where the public owner is required to treat all competitors equally and non-discriminatory. If nothing else, those project constraints that require laborious administrative procedures to remove usually constitute an obstacle. Thus, collaboration is seldom genuine and profitable and much potential may be wasted in cases like this.

Thus, the current solution is to strive for an open process (incl. independent cost estimators, etc.) where the price (target cost) of the project is set later after a joint development phase by the owner and the selected team. However, it is not reasonable to ignore the cost and price elements totally even then and give the service provider disproportionate power to price the service/project subsequently which might happen as a result of the contractors’
higher cost consciousness (or information asymmetry). Actually, it is necessary especially for public owners to set constraints and/or a mechanism for price formulation in order to ensure price competitiveness also in the case of early involvement in order to comply with public sector accountability concerns. This leads to a complicated set-up and it is uncertain how such an approach works in practice. Accordingly, the essential goal of the study is to determine whether it is possible to find procurement procedures that integrate broad-based competition with good, creative collaboration. That is of critical importance especially since ‘public sector accountability concerns’ have been considered the number one factor hindering the use of relational contracting in public construction [6].

More precisely, this paper aims to increase the understanding of the possibilities and appropriateness of using partial price factors in case of early involvement in public procurement by delving into the practices and experiences of four different infrastructure projects. In those Australian and Finnish public projects team selection was based only on price tenders for some cost items or parts in addition to capability assessment. These items do not cover the total project price. The price components used in those four projects were, for instance, fee, project overhead, risk and opportunity provision, preliminaries and defect correction cost. In the case of assigned components tenders are binding. That which was not covered by the components was left to be priced during subsequent collaboration.

In other words, the proponents themselves do not seek/present a total price for a project: just an estimate of the unpriced part is prepared on the basis of the owner’s own cost-estimate items and/or offered component prices to determine the comparative price. In the end, the selection criterion is the ‘most economically advantageous tender’ which means that capability/quality is always taken into account in selection in addition to (comparative) price although it is not delved into here. The descriptions focus mainly on price components, and other aspects are described only to the extent that they are linked to the use and use criteria of components. Correspondingly, for the purposes of this study, the listed approaches are jointly called ‘price component selection’ despite the term’s possibly limited interpretation.

The paper starts with a closer look at the need for targeted practice due to the on-going tendency toward relational contracting and better integration of the construction team. That is followed by an analysis of cost uncertainty and the ability to impact costs which vary during the advancing process. The analysis produces two imprecise critical points to serve as a frame of reference for an examination of the practical examples thereafter. There, the focus is on the price components used as selection criteria in four different case projects which are also examined in relation to the said frame of reference for a better understanding of the wide range of possibilities in existence. Appropriateness of the different approaches is then discussed based on interviews of parties to the projects while some remarks are also made from the viewpoint of public procurement regulations. The European perspective is emphasised in the study; the different constraints possibly existing in other parts of the world are not examined.

Need for a change

From adversarialism to collaboration

Fragmentation of the construction process and the resulting adversarial relationships between the involved parties have led to a lot of criticism towards prevailing procurement practices. The initial reason seems to be the separated design and construction, or disintegration of the construction project process in general (e.g. [7]), where the low bid syndrome can be recognised as a major determinant behind the customary adversarial behaviour [8–12].

‘Relational contracting’ has been offered as a solution to these challenges. This is due the fact that a contract based upon a relationship of trust between the parties, where responsibilities and benefits are apportioned fairly and transparently, is called ‘relational’ as opposed to ‘transactional’. This kind of duality can be traced back to the relational theory of contract (e.g. [13]). In practice, relational and contractual mechanisms are complementary parts of the governance continuum of a project [14, 15]. While explicit contracts are needed to reduce uncertainty and minimise opportunism, they can only cover foreseeable contingencies — specifying everything would increase planning costs and prevent a flexible and quick response to unforeseen events. This is where the relational aspect, with its socially complex routines, comes into play in interorganisational relationships.

Critical consideration of contract law also provides a basis for the theory of ‘transaction cost economics’ when examined jointly with economics and organisation theory (see [16]). In reference to the theory, it says in [17], for instance, that due to ‘bounded rationality’, the actors in any contract have limited foresight and are unable to foretell the future, nor can they fully, precisely and unambiguously specify the known aspects due to the limitations of language and the cost of calculating and communicating plans and solutions (cf. [18]). While ‘asset specificity’ ties the contracting parties together due to the losses caused by termination and changing service providers, ‘opportunism’ in the form of pricing of extras may occur. Bearing this in mind, the initial tender may have been
manipulated already considering the existing loopholes referred to above. Moreover, it is stressed that in traditional
delivery methods an increase in reimbursable costs generates also costs that are not allocated to the project meaning
that part of the cost effects often go unrecognised. For these reasons, traditional contracting would lead to an
uneconomical result especially in complex projects from the viewpoint of the owner (see e.g. [17, 19, 20]), which
explains the contents of ‘the low bid syndrome’ referred to above.

Relational contracting is also called for by the change that has taken place within the modus operandi of the
industry and its clients. The owners of built assets have increasingly regarded them as strategic means to improve
the performance of their core operations (e.g. [21]. Correspondingly, they have in many cases started buying
business solutions, not just construction capacity, which, moreover, requires employing relational contracting
practices [15]. In general, there are various forces driving towards further servitization of construction [22].
Servitization, which means integration of additional services, knowledge and support to the supplier’s core product
offerings, also puts the firm face-to-face with its customer [23] increasing thereby the importance of the relational
mechanisms that supplement the contract [14]. Moreover, performance in demanding, risky projects could
obviously be improved by joint risk management [24, 25].

From sequential process to joint development

Studies aimed at fostering innovation in construction also stress the need for closer integration and improved
collaboration [26–28]. Systemic innovations, especially, require comprehensive or multidisciplinary expertise. It is
also clear that co-operation that begins early enough with respect to design creates the best possibilities for utilising
the partners’ expertise in seeking better and more cost efficient solutions than the conventional ones. This is based
on the fact that the ability to impact the cost weakens, and the cost of design changes increases, when the process
proceeds as illustrated at the top of Figure 1 imitating literature (e.g. [29–31]). Yet, conceptualisation of the project
prior to the mobilisation of the entire team is needed to direct the work.

Although innovation-orientation may be considered the main driver for renewal, studies on the negative influence
of project changes in the current practice provide some understanding of the existing potential. In [32], for instance,
it is concluded that the fragmentation of the design and construction process increases the likelihood of change
orders with conventional project procurement methods causing significant cost and time overruns. Most change
orders arise from problems in planning and design [32–35], which early team integration is believed to alleviate. In
[36], again, it is shown how late change is more disruptive of project productivity than early change as also shown
in the figure.

On the other hand, as illustrated for instance by [37] and [38], a project budget evolves towards an increasing level
of accuracy: the spread of uncertainty becomes narrower, as would be expected due to the intensive work
undertaken by the team to develop the plans. Since risk premiums alternate in parallel with risks (e.g. [39]), the
owner should aim to fix the pricing of the project relatively late in the process as outlined in the middle of Figure 1.
In other words, early pricing with inadequate planning lead contractors to add arbitrary premiums to their quoted
prices potentially resulting in money being wasted by the client [40]. Yet, the pricing should normally be agreed
prior to launching the costly construction phase to avoid the situation where the owner carries all the risks.

Practical application of both of the above viewpoints means early involvement of the construction team (Step 1 in
Figure 1) combined with late fixing of the price level (Step 2). In other words, early involvement of the
construction team which leads to the signing of a final contract (although conditional) is of primary importance for
the project’s success providing that an arrangement ensuring a reasonable price later in the process can be
developed. Such arrangements, for the most part, are examined later in the paper, and the two-node process
reintroduced at the bottom of Figure 1 forms a tentative frame of reference for that.

The importance and potential of this ‘development stage’ (between Steps 1 and 2) is obvious also on the basis of
earlier research. The reported experiences from early involvement are mostly positive [2, 3, 40–43] especially when
the team is involved with the intention of implementing the project to completion – consultative involvement is not
likely to work as efficiently due to the inadequateness of incentives or, more precisely, the existence of
disincentives [44]. All in all, it is clear that the trustful relationship of ‘relational contracting’ should not be
understood only as a collaborative component of a contract after all its price-inclusive conditions have been fixed.
Case examples

Common project characteristics

This chapter presents four projects adhering to the practice of ‘price component selection’ to introduce the change of the previous section (partially) to traditional practice while yet remaining cost conscious and observing public sector accountability requirements – not putting the owner at the service providers’ mercy.

More precisely, these projects are alliancing projects for major infrastructure procured by public bodies. Project alliance is a project delivery method based on a joint contract between the key actors to a project (owner, designer, constructor) whereby the parties assume joint responsibility for the design and construction of the project to be implemented through a joint organisation, and where the actors share both positive and negative risks related to the project and observe the principles of transparency of information in pursuing collaboration [45, 46]. The alliancing practice also typically leans on the early involvement of the team for joint development. Thus, it truly is a form of relational contracting.

The project alliance system evolved from the need to improve the implementation of demanding and risky investment projects – due to, for instance, new technology and project conditions or interfaces – and it has broken through especially in Australia [47, 48].

Overall selection process

The overall selection method naturally varies per project but is generally based on both qualitative and price components. Typically the competition entrants, who have been selected as tenderers, receive a request for proposals. After the first round proposals have been submitted, the number of tenderers is reduced based on an assessment including interviews. Thereafter, two competing teams usually continue to the stage involving workshop tasks that are evaluated as a part of qualitative criteria. Then, the competitors give their quotes for the requested price components. Sometimes pricing is openly discussed already during the preceding workshops (e.g. in case of a risk analysis which is of no real value if cost consequences are not dealt with), but most often they are finally tendered in a sealed envelope that is opened only after other evaluation measures have been completed. As a rule, the tendered price components have been binding. Selection is then made based on joint assessment of the team’s capability and a comparative price constructed from the quotes.

Figure 1: Illustrations of the two conceptual fulcrums of the involvement process.
Overall, that was the process primarily followed in the presented cases with a few exceptions. In Case 4, the final evaluation of capability was done already in an earlier stage and the three competitors continuing to the last stage focused just on project design and pricing. Case 4 was also different from the others in that cost escalation provision was not needed due to later index-linking whereas in the other cases the tenders also had to cover cost escalation. In Case 3, again, some of the presented price components were not binding.

Subsequently, selected service providers develop the project and its design in co-operation with the owner before the actual target cost (or target outturn cost, TOC) is set and the parties are ready to finally commit to the implementation of the project in question. Thus, TOC is agreed prior to launching construction and termination is possible if the parties are not able to agree on, for instance, the TOC. The TOC is to be based on quoted price components and, the remaining part, on project/risk- and market-adjusted (or tested), audited direct costs of earlier projects. After the completion of the project, the owner and service providers share the difference between the target and outturn costs.

One characteristic of the selection process needs to be emphasised in particular since the following presentations skip examination of the quality/capability assessment: evaluation of capability – with its manifold meanings – is a very in-depth, stage-wise process especially if the price components are rare (cf. [47, 49]). It includes interviews and collaborative development workshops often with a psychologist involved in the evaluation – in addition to the more usual criteria of past performance, know-how and experience of section managers, and project specific narratives on strategies, approaches and management plans.

Case 1: Road tunnel with junctions

The project involves relocating an arterial road that is a major entry road to a city as well as a through road for long distance traffic. The aim is to bury part of the road, that currently divides the city and becomes regularly congested, in two 2.3 km tunnels with three lanes in each direction, to widen the rest of it (along 3 km), and to connect it to the surrounding traffic network by graded interchanges. Besides the city infrastructure, the tunnels will also pass under the rapids traversing the city at 20 metres below the river bed. The price components used in the selection were the following [50]:

- Fee percentage of design companies which consists of company-level overheads and expected profit when the fees of designers to the main contract are combined according to their work shares.
- Fixed-fee of contractors which consists of company-level overheads and expected profit when the fees of contractors to the main contract are combined according to their work shares.

The owner used the same – his own – direct cost estimate in comparing competitors, which thus became the basis of the assumed size of the direct costs of both last stage proponents. Based on data from earlier projects, the owner divided the total cost estimate into likely design and construction costs for the calculation of a comparative cost. Designers’ fee was calculated from the design share (based on the percentages) after which all items were added up to arrive at a total comparative cost (Figure 2). Selection was then made based on joint assessment of the team’s capability and the comparative price where the former carries greater weight than the latter. Due to the small number and limited coverage of concrete price components, the cost viewpoint is reflected in the selection primarily as a component of capability through the proposed method for control of the economy, presented budget critique and suggested development possibilities. Thus, it is not question of track records and formal qualification, but a solution-oriented view is required.

![Figure 2: Formation of comparative price in the road tunnel project.](image)
Case 2: Water treatment plant

The project involves renovation of a water treatment plant that processes the sewage of about 1.5 million people. Before the renovation, the treatment system consisted of two main stages that were not modified. Instead, the renovation added a third stage to the process, which improved the treatment result considerably. The project was a new type of combination of technologies, which means that the implementation also involved technologically demanding development. Besides, the intermediary storage of water between the second and third stages and its reorganisation/location posed a big challenge to the project. The price components used in the selection were as follows [51]:

- Preliminaries costs that cover costs related to the erection of temporary structures for launching the site (such as fences, site roads, warehouses, site offices).
- Project overheads, which here cover the project-level management costs (e.g. safety officers, supervisors, accountants, financial systems) of the entire project until completion.
- Risk and opportunity contingency based on the risk analysis made by proponents, that is, the pricing and summary of risks and opportunities constituting a risk allowance to be included in the TOC.
- Fee percentage which consists of company-level overheads and expected profit when the fees of designers and contractors are combined according to their work shares.

The owner used the same – his own – direct material and labour cost estimate in comparing competitors, which thus became the basis of the assumed size of the direct costs of both proponents. The cost items priced by the proponents were added to the cost level of the owner’s estimate: management costs, site establishment costs, and risk contingency (Figure 3). This total cost was then increased by the share of the fee derived from this sum based on the fee percentage submitted by the competitors. The result of this calculation provided a comparative price for the competitors. Selection was then made based on joint assessment of the team’s capability and the comparative price.

![Figure 3: Formation of comparative price in the water treatment plant project.](image)

Case 3: Road bridge and surroundings

The project involves replacing an existing road bridge across a river with a new one next to a rural community. The new approx. 150 m long two-lane bridge with a separate lane for light traffic will be built in the immediate vicinity of the old bridge that is to be dismantled later. The work includes the implementation of walls subjected to loading from earth and erosion reinforcements as well as road connections and nearby access and intersection arrangements. The special challenges of the project derive from the fact that the bridge is connected to the adjacent square of special cultural-historical importance.

In the competition, most of the components needed to determine the full price were tendered for. Only some relatively insignificant parts, such as the relocations of utilities/services networks, were not priced. Yet, some price components were indicative only while others were binding. The price components to be tendered for at binding prices were [52]:

- Bridge TOC, which is the total of the labour and material costs needed to build the bridge (without a specific risk provision).
- Risk contingency for bridge, a risk premium produced by risk analysis of bridge building to be included in total TOC.
• Project overheads TOC, which cover the overheads of both the bridge and the so-called balance of works of the project.
• Risk contingency for project overheads, a risk premium produced by risk analysis of overheads to be included in total TOC.
• Fee percentage consisting of company-level overheads and profit margin. A corresponding share of the sum of all other cost items is included in the tender/TOC.

In addition to the above binding components, the following price components were offered as tentative prices:
• Budget TOC for the balance of works, that is, a preliminary estimate of the total cost of inputs other than those required for building the bridge.
• Risk contingency for balance of works, a preliminary risk premium produced by risk analysis of a so-called balance of works to be included in total TOC.

At the same time, the model with its indicative scope and unit price data determined the way of calculating how later changes in components tendered for at tentative prices affect the overall price.

The owner calculated the total prices of the alternatives on the basis of the price components submitted by the proponents as illustrated in Figure 4, i.e. including the contribution and influence of the owner’s estimator. The final selection of the contractor was based on both capability and price. In principle, the intention was to assign equal weights to quality and price.

![Figure 4: Formation of comparative price in the road bridge project.](image)

**Case 4: Arterial road with junctions**

The project involves a massive road investment for improving a main road network and increasing its capacity. The works centre around an about ten kilometre section of a highway bypassing a major airport. Additional lanes are being built for this section and many junctions are being rebuilt, a few are being expanded into complete interchanges. The project also includes the improvement of many kilometres of roads intersecting the main road and some other roads in the area. The works are mainly restricted by existing urban structure and the airport area.

The selection model can be considered a partial price competition model due to the extensive scope of the project, although the pricing concerned a considerable part of the road network practically in its entirety, covering all costs at binding prices. The price data to be specified in the tender consisted of the following parts [53]:
• Total price of construction works covering the specified part of the project (road network; utilities/services networks, etc. excluded) based on a unit cost calculation to be submitted as part of the tender.
• Defect correction percentage, which is a cost item reserved for warranty works, calculated from and added on top of actual construction costs.
• Project overheads (site overheads and other staff costs) which are supplemented in the case of design and supervision with the related staffing plan and corresponding breakdown of costs.
• Risk provision percentage that describes the risk provision to be added on top of direct costs and calculated on their basis, which in the light of the risk analysis is sufficient to cover expected variation in costs.
• Fee percentage that consists of company-level overheads and expected profit when the fees of designers and contractors are combined according to their work shares.
The owner used the unit costs submitted by the proponents in determining the comparative cost while calculating the estimated magnitudes of the costs of actual construction works for parts of the project to be designed later. These parts were not subject to design in the competition, although they were also meant to be included in the works under the very same contract together with the road section priced in the tender. Thus, we are dealing with areas 2 and 3 of Figure 5 illustrating the calculation of the comparative price (whereas only part 1 was included in proposal planning and pricing). Besides, the owner used his own cost estimate for some works excluded from tender pricing, which was the same for all competitors.

The total comparative price was arrived at by adding to the construction costs determined phase by phase first the cost of warranty works calculated as a percentage of them, and then the sum of project overheads also compiled phase by phase, as well as the risk provision and fee of the service providers to be calculated later on the basis of the percentages submitted by the proponents. The risk provision was calculated from the mentioned item covering direct costs and project overheads, and it was added to the cost estimate before calculating the fee from the resulting sum of costs that included the risk provision. However, the setting of the comparative price was not just mechanical calculation, but the evaluation team also had to do a lot of work in making the tenders comparable. The selection, yet again, was made on the basis of both capability and comparative price while the latter carried more weight this time due to the relatively complete design of a critical section of the project.

Discussion and conclusions

General assessment

The case projects shed interesting light on both the possible applications of price component selection and the reasons behind its use. Both the reasons and applications were different in all mapped cases:

- In Case 1 the model was used in the most minimalist way where the fee was the only price component quoted by the proponents. It was considered that the most important determinant of efficient project solution was early integration of the team and genuine, collaborative joint development due to the uniqueness and uncertainty related to the project. Competitive tendering on sub-contracts and price transparency were also of importance, in addition to the fact that the owner’s budget had already initially been considered stringent.

- In Case 2 the model was used mainly to determine project and company overheads and joint costs. Direct costs were determined largely on the basis of later competitive tendering on sub-contracts, so there was no need to price them during the selection of the alliance team. Thus, the use of indirect costs as competition components locked in the price determination criteria reliably enough, and use of the owner’s own cost estimate for direct costs made it possible to calculate a reliable comparative price.

- In Case 3 the model was used due the genuine uncertainty related to implementation. The whole was clearly composed of different types of largely independent sections: the main part of the project could be priced and there was significant uncertainty only about the other part of the project, which justified the use of this model. The former project part was priced in the competition, while an estimate was adequate for the latter part of the comparative price, as project overheads were included in the tenders comprehensively.
In Case 4 the challenge was the extensive scope of the project, which is why a large portion of the project had not yet been defined by the competition phase. A key part of the project was developed and priced during the competition. On that basis the owner could calculate a comparative price for each proponent using the tender prices submitted and the default project size and contents. Thus, the unit prices specified in the tender also acted as guidelines for the price level of the project part that had not yet been designed.

A summary of price components used in the case projects is presented in Table 1. A characteristic feature of most components is that they are contingency provisions or joint costs and overheads added on top of direct costs. Direct material and labour costs are also priced partially sometimes in search of innovative project solutions. Their use can also be the solution when the owner considers it inadequate to base the selection on contingency provisions and overheads only (in addition to capability, etc.). In the case of a large project it may be reasonable, for instance, to request proposals for a certain part of the project area-wise while selection is based on the comparative cost of the entire project (cf. Case 4). In determining the comparative cost, the owner can use the unit costs submitted by the proponents as a part of their proposals to calculate the estimated magnitudes of the costs of actual construction works for parts of the project to be designed later in the joint development phase. An alternative is to break down the project structure-wise so that the proposals cover only critical structures throughout the project (Case 3) or within a section (Case 4). (More information on Cases 2–4 is available in [54], and on Case 1 in [55] and [56].)

Table 1: Bases for definition of price components of case projects.

<table>
<thead>
<tr>
<th>Case 1: Road tunnel with junctions</th>
<th>Case 2: Water treatment plant</th>
<th>Case 3: Road bridge and surroundings</th>
<th>Case 4: Arterial road with junctions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fee</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Cost escalation</td>
<td>✓**</td>
<td>✓**</td>
<td>✓**</td>
</tr>
<tr>
<td>Risk contingency</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Project overhead</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Preliminaries costs</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Direct costs, structure-specific</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Direct costs, section-specific</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Defect correction</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

* Part of risk contingency.  ** Part of direct costs.  *** Direct costs are tendered in the case of certain structures of a diverse project.  **** Direct costs are tendered in the case of a certain section/area of a wider project.

As to Case 4, the owner had already used a very similar price component selection procedure to select the team for an earlier road project. Its components corresponded to those used in this project with the exception that in terms of direct costs only part of the pavement had to be priced, although the contract covered the design and construction of the entire road structure so that the total costs were many times larger than the priced part. Both the owner and the service provider seemed to be highly satisfied with this previously used lighter model, but the huge size of the current project together with public accountability concerns forced extending the set of components to cover a bigger share of the project. To illustrate other possibilities deviating from Case 1 (where the owner used the same direct cost estimate for both proponents), only a fee quote can be requested while a proponent-specific estimate is prepared by the owner’s estimator for the comparison adhering to a model used in another Finnish project where a proposal included a partial concept design for the project ([57]; the comparison was structured differently in the actual case, however). And other possibilities not captured by the study surely exist.

All in all, there are numerous ways of applying price component selection as shown just by the case examples. The used price components were different, and the organisation of the selection processes also differs, for example, in the timing of the workshops. The amount and nature of proposal planning also vary. Perhaps the most important factor is the weights the owner assigns to competitive pressure and genuine joint development for the benefit of the project, i.e. how the ‘development phase’ of Figure 1 breaks down into the ‘competition’ and ‘joint development’ stages of Table 2. Some procedures are not very far from traditional auction while some really are. Accordingly, the more design is needed for a proposal, the more weight is assigned generally to comparative price in the selection. In fact, the extreme models apply very different strategies to the development of the project and its value for money which allows drawing only general conclusions.
Experiences

Experiences from the use of price component selection in the presented cases vary correspondingly with the fact that the models used in the four case projects differ from each other in many ways. In the case of partial price selection models that aim at a relatively unambiguous and comprehensive comparative price, the same doubts often arise that have been found problematic in pure price competition. Besides, the use of price components may make procurement more challenging, unless the contents of the components have been clearly defined. At worst, the proponents get frustrated interpreting the contents. The formation of the costs of projects is a complex equation including many interdependencies and even overlaps where the interpretation of the content of an individual component may depend on the performer of the calculation. On the other hand, there is the risk that the design solution is manipulated to lower the comparative price without really improving the efficiency of the project.

This also makes the comparison of tenders more challenging. Practice has shown that the owner often has to work to make the tenders commensurate before deriving genuinely comparable reference prices from the tenders. For these reasons, the price components of the partial price selection model should naturally be as independent cost items as possible. This is also required by the fact that the low prices of components included in the competition cannot be compensated for later by other cost items priced only at the development phase. Moreover, price components should be defined so that they play a central role in the formation of the overall costs and that they cannot be compensated for later by other cost items priced only at the development phase. Furthermore, price components may depend on the performer of the calculation. On the other hand, there is the risk that the design solution is manipulated to lower the comparative price without really improving the efficiency of the project.

To make comparisons easier in the case of an alliance project with a joint organisation, proponents should also assume at the competition phase that all tasks are performed solely by the staff of the service providers. Risk contingency is a more conceptual factor that also poses a challenge. It is worthwhile incorporating the risk view of all proponents in the owner’s register at first, and later to let them price the revised version. Risk contingency may not, however, be a reasonable factor in price component selection unless the related uncertainties can be expected to be largely minimised during the joint development stage before fixing the TOC. Fees and even project overheads, again, are appropriate in most cases due to their insensitivity to variations in direct costs. The breakdown of costs into direct and indirect ones must, however, always be clarified, since companies seem to have different practices in that respect. Direct costs, on the other hand, can be eliminated from the competition the more likely, the larger the share of the project purchased from the market or based on standardised solutions is.

Thus, in some cases, the use of the price component method may be even more demanding than full-price selection. Experiences from the projects have, however, been for the most part very encouraging and support the validity of price component selection due to the reasons given in the ‘need for a change’ section above although possible caveats were listed as an advisory for future applicants. Especially in the case of more demanding projects it is evident that the other advantages gained by early involvement and collaborative project development weigh more than the challenges of competitive tendering. This was also underlined by the participants of the studied projects. In the case of the simplified applications of the studied projects, no express criticism was levelled at the selection method either.

It must be emphasised that the presented view is based on interviews of the owner’s and service provider’s representatives in all presented cases. At the time of the interviews, some of the projects (Cases 3 and 4) had just completed the selection phase and, naturally, there is no certainty about what the definitive experiences will be. Yet, the overall assessment was highly positive and optimistic. The projects that had progressed to implementation/construction (Case 1) or completion (Case 2) were even more so: the parties were absolutely satisfied with the cost efficiency and believed that better results could not have been achieved by any other methods (e.g. [58]).

Public procurement view

Although all the presented cases represent public construction projects, Case 1 is obviously the most interesting one from the public procurement perspective for two reasons. Firstly, it is a procurement that was carried out in Europe, in Finland, while Cases 2–4 describe Australian activities. (Based on anecdotal evidence, a model similar to that of Case 1 has also been occasionally used in Australia although it is not dealt with in this study.) The author’s view is
based on the fact that in Europe public procurements are controlled by basically clear regulations (whereas in Australia there are no similar, universally applicable regulations, and the decisions on procurement practices are mostly made by public servants and politicians under the guidance of various policies). Secondly, in Case 1, the price components were the least comprehensive leaving most of the pricing to take place only after the selection which may be presumed to provide the most potential for violating the regulations. This view is based on the fact that although the European directive on public procurement allows the application of ‘the most economically advantageous tender’ criterion, it implicitly also includes the price viewpoint.

Yet, a project that applies the price component method in selection can rely on numerous means for managing its costs. Naturally, the actual method depends on the project and used price components. In general, however, at least the following means were used in the studied projects:

- The owner reserves the right to subject final stage competitors to financial audits where the level of costs of realised projects can be assessed to serve as a benchmark in evaluation.
- Besides the specified price components, the proponents are expected to include their pricing bases in their tenders for additional auditing and to serve as benchmarks for the parts to be estimated later on.
- Major purchases of the project are to be jointly subjected to competitive bidding later and, at the minimum, the prices are to be market-tested (the contractor may do the work if competitive enough).
- An independent third-party estimator is involved to assess the appropriateness of the target outturn cost (TOC) and the cost items it consists of (evaluation of costs and justification material).
- A financial auditor is involved to verify costs incurred and financial management in general (auditions of financial systems, breakdown/limitation of direct and indirect costs, audit of reporting and invoicing).
- The owner’s budget guiding the joint development and pricing of the project is based on two expert estimates completed independently and is made strict compared to the general cost level in the market.
- The owner has the right to terminate the project for convenience, without default, for instance, but the owner has to pay a fair compensation for all work and services carried out by then.

These features of the practice led the owners of the presented case projects to regard it the most appropriate method to provide good value for money in the targeted projects considering their properties, constraints and objectives. The requirements of owners included flexibility in scope definition and fast completion as well as the ability to introduce novel technologies for improved performance. Another reoccurring challenge was created by the fact that the work disturbed on-going operations and that numerous stakeholder issues had to be solved in the course of the project. The uncertainty due the project constraints and conditions was part of the challenge as were the multi-dimensional value systems of projects. That is to say, that although the study speaks for the use of price component selection it is not suggested as an all-round solution for all projects.

On the above basis, also the owner of Case 1, the Finnish Transport Agency, made a decision to use the described selection model. Due to the cost management measures itemised above, it was considered that the price view was incorporated into the decision making process to a reasonable degree except for part of company overheads and profit. Therefore, it was seen necessary in the completion phase to request a fee which was also seen as the minimum condition for procurement to meet the requirements of the regulations on public procurements (i.e. [59, 60]). In terms of the current public procurement legislation, the described procurement practice is based on the stage-wise ‘negotiated procedure’ where ‘the most economically advantageous tender’ is the selection criterion [50]. According to the directive, this procedure could be used ‘in exceptional cases, when the nature of the works, supplies, or services or the risks attaching thereto do not permit prior overall pricing’. Yet, 13% of all public construction by value is procured by the negotiated procedure in Europe [61]. All of the above suggests that there is room for the presented models despite the restriction.

What is more important, however, is that the directive has recently been updated [62], and within two years it (the relevant parts) should be guiding the practice after having been transposed into national laws within the European Union (EU). Although the author refrains from legal interpretations, it is clear that the new directive broadens the possibilities for negotiation. Thus, it provides a long awaited opportunity to consider new approaches and, consequently, use of price component selection also in the procurement of major, largely public, infrastructure projects. Yet, it should be noted that when EU Directives are implemented through national laws, they may set stricter terms for various alternatives. Therefore, it is not necessarily certain that the practice is applicable as such to all countries within the EU.

Closing remarks

Along with the change in procurement and project delivery practices, and the corresponding increase in the use of relational contracting, project alliance has proved its applicability as a project delivery method of demanding projects. At the same time, it has established itself in the realisation of complex infrastructure projects in
Australasia and is also spreading to other continents. Early involvement of implementers in collaborative design is a central part of the solution, and it cannot be combined effectively with full-price competition. This has caused price components to be used in parallel with qualitative criteria since that is often considered necessary to maintain competitive pressure and gain acceptance in the eyes of politicians, auditing authorities and the general public. In selection based on price components, the tender covers only part of the items that finally make up the total price of the project.

The study has examined experiences gained from projects applying various forms of competition that include price components as selection criteria. In their totality, the experiences from case projects have been highly positive and definitely also encourage considering the possibilities of using the partial price selection model also in challenging future projects of the public sector. Especially, since the performance of full-price selection is often questionable in projects requiring innovative approaches and flexibility and ones that involve many constraints and uncertainty. Yet, the practice should be combined with the principles of transparency of information (incl. external auditors and estimators) and emphasis given to the creation of collaborative, trustful relationships among the team members.

It must, however, be remembered that different projects call for different selection methods derived from project properties and boundary conditions of implementation. Price component selection is not expected to be the answer to all situations and projects: more straightforward and standard projects may still be best procured by more conventional methods than the one discussed in this paper. Yet, since projects are becoming more complex and more constraints and requirements are set by society and stakeholders, the number of projects that would most likely benefit from price component selection is growing. It seems to be a model, which at best, efficiently integrates competitive pressure and genuine joint development for the benefit of the project.

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Seven Years of U.S. Defense Acquisition Research: Analysis of Proposals and Projects

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Abstract
In 2006, the U.S. Defense Acquisition Executive approved a sponsored program to solicit, evaluate, and fund proposals for innovative, scholarly acquisition research. Administered by the Naval Postgraduate School, this program has led to the submission of over 300 research proposals each year since 2007; about a third of those have been approved for funding each year. This paper presents an exploratory analysis of data on these proposals and awards in order to gain an understanding of the types and sources of research that has been proposed. The data are classified and examined according to several key aspects, such as the following: topical area (e.g., contracting, logistics); research type (e.g., exploratory, hypothesis testing); research design (e.g., case study, experiment); and type of analysis (e.g., comparative, statistical). Cluster and trend analysis indicates areas of high/low and developing/waning research interest during the seven-year period. Comparisons of accepted and rejected proposals indicate evaluator preferences and potential biases in several categories. The paper’s findings provide a basis for judging the extent to which the program has accomplished its objective to improve the quality and quantity of scholarly research in defense acquisition.

Keywords: defense acquisition, defense procurement

Introduction
In 2005, Jack Gansler and Bill Lucyshyn of the University of Maryland’s Center for Public Policy and Private Enterprise made compelling arguments for the need for a focused program of research in defense acquisition [1]. Noting (1) the large resource investments typically consumed by military procurement; (2) recurring problems experienced by large weapons programs in terms of cost overruns, schedule delays, and performance shortfalls, despite numerous reform initiatives; (3) the rapidly changing political, technological, and economic aspects of the world’s defense environment; and (4) the relative lack of scholarly research devoted to these topics, Gansler and Lucyshyn called for a “disciplined basic and applied research program [as] the only proven way to develop new theories and then use them to solve specific, practical questions within [the defense acquisition] knowledge domain” [1].

Partly in response to this call, the Acquisition Executive for the U.S. Department of Defense (DOD) in 2006 approved a program to support relevant and innovative proposals for acquisition research projects. The Naval Postgraduate School’s Acquisition Research Program (ARP), which had been in operation since 2003, was designated as the executive agent for this new program. Beginning in 2007 and each year since, the ARP has issued a call for research proposals, led a review and selection process, and coordinated awards of funding to support the approved research projects. As of December 2013, 319 proposals have been reviewed with 128 selected for award.

In this paper, we undertake an exploratory analysis of the proposals and awards that have been generated by this program in order to understand the nature of the larger scholarly environment that may support defense acquisition research. Specifically, we seek an understanding of the content of the proposals and their sources; that is, “What sort of research has been proposed, and who has proposed it?” We ask questions such as the following: What are the specific topics in which researchers have interest? What research designs, methodologies, and data are
employed? What universities and other institutions have interest in acquisition research? The answers will provide information on the breadth and depth of the capacity for defense acquisition research, as well as indications as to whether the research program is accomplishing its objectives. Ultimately, the usefulness of the ARP and similar programs must be assessed in the extent to which they contribute to improvements in defense acquisition, but of course such assessments will not be possible for several years.

This paper makes several contributions to public procurement thought and practice. First, it sheds much-needed light on research in defense acquisition, a neglected but important area of public procurement [2]. It also illuminates potential issues with public procurement research as they relate to public procurement’s critical importance [3] and its status as an academic discipline [4-5].

We acknowledge this study’s limitations. The proposals submitted to the ARP during this seven-year period may not be a representative sample of the universe of defense acquisition research efforts underway throughout the world. The proposals were submitted by researchers seeking monetary support for their projects, and the possibility must be admitted that the actual research performed does not always correspond to the research that was proposed. Finally, our methodology, which is described below, contains potential for coding errors and biases. Thus, our results and conclusions must be taken as merely suggestive of the state of defense acquisition research and, by extension, of public procurement research.

Following a brief background on defense acquisition research, we describe the annual process of solicitation, review, and selection of research proposals. We then review the methodology employed to categorize various aspects of the proposals. Data on research proposals and awards since 2008 are then presented in tabular and graphical form, and we note points of interest and significance. We conclude with a synthesis of the major findings, with implications for the ARP and for defense acquisition research in general.

**Background of Defense Acquisition Research**

The call by Gansler and Lucyshyn [1] for attention to defense acquisition research reflects a long-standing recognition of its potential importance. Significant institutional interest in defense acquisition research has been evident for some forty-five years (Table 1).

<table>
<thead>
<tr>
<th>Organization/Event</th>
<th>Year Established</th>
</tr>
</thead>
<tbody>
<tr>
<td>Army Procurement Research Office</td>
<td>1969</td>
</tr>
<tr>
<td>Procurement Research Coordinating Committee</td>
<td>1971</td>
</tr>
<tr>
<td>Annual Federal Acquisition Research Symposium</td>
<td>1972</td>
</tr>
<tr>
<td>Air Force Business Research Management Center</td>
<td>1973</td>
</tr>
<tr>
<td>Federal Acquisition Institute</td>
<td>1977</td>
</tr>
<tr>
<td>Naval Center for Acquisition Research</td>
<td>1977</td>
</tr>
</tbody>
</table>

**Table 1:** U.S. Defense Acquisition Research Initiatives [6, p. 95].

The potential resource represented by university scholars has also been noted [7-8]. Perhaps more significant is the long-standing recognition that, despite these resources, acquisition research generally reflects a lack of both quantity (i.e., few researchers devote attention to it) and quality (i.e., the little work that is done is questionable in terms of methods, data, and rigor) [8-11].

Faculty members at the DOD’s two graduate schools—Air Force Institute of Technology (AFIT) and Naval Postgraduate School (NPS)—have vested interests in acquisition research, because they educate students to take leadership and management positions in the DOD’s acquisition workforce. Accordingly, much extant research emanates from the faculty and students at these institutions. In 1997, faculty members at NPS issued a call for papers for a special issue of *Acquisition Review Quarterly*, a peer-reviewed journal published by the Defense Acquisition University. The call targeted scholars in universities and other research institutions “to engage their interest in defense acquisition as a primary area of research” [6, p. 89]. Response to the call was, however, “underwhelming” (p. 102), generating only one of the seven accepted articles. (The others were generated from personal solicitations from the special issue guest editors.) The guest editors concluded that, if there exists an untapped pool of potential defense acquisition researchers, there is “no effective formalized mechanism for bringing their work to bear” on acquisition matters (p. 103).
A program with precisely this intent was established at NPS in 1998 by direction of then Defense Acquisition Executive Gansler. Dubbed the External Acquisition Research Program (EARP) to reflect its focus on non-DOD (external) researchers and institutions, the program provided funding for fifteen research projects beginning in 1999 until its termination in 2001 due to budgetary constraints [11]. The EARP essentially served as a predecessor for the ARP, which, as mentioned in the introduction, was initiated in 2006 and is the subject of this present study.

**Execution of the Research Program**

In this section, we describe the ARP’s annual process of soliciting, reviewing, and selecting defense acquisition research proposals for award.

Each year, the ARP publishes an open solicitation at a central web portal called Grants.gov. The solicitation is also distributed to hundreds of contacts in the ARP’s mailing list, and it is also publicized at the ARP’s annual research conference. The primary objective of the solicitation is to attract outstanding researchers and scholars to investigate topics of interest to the defense acquisition community.

The solicitation specifically solicits proposals for “defense acquisition management and policy research,” which refers to investigations in all disciplines, fields, and domains that (1) are involved in the acquisition of products and/or services for national defense, or (2) could potentially be brought to bear to improve defense acquisition. These include but are not limited to economics, finance, financial management, information systems, organization theory, operations management, human resources management, and marketing, as well as the “traditional” acquisition areas such as contracting, program/project management, logistics, and systems engineering management. The solicitation requested projects of 12 months duration with budget ceilings of $100,000 in the first year and then increasing slightly each year thereafter; the 2013 ceiling was $120,000.

The solicitation remains open for eight weeks. Proposals are then collected and distributed to the review and evaluation committee, which typically includes six representatives from DOD research and academic organizations. The committee convenes to discuss and rank the proposals according to (1) overall scientific and technical merits; (2) offeror’s capabilities, related experience, and past performance; and (3) project cost. Awards are made starting with the top-ranked proposal and then proceeding to lower ranked proposals until the budget ceiling has been reached.

Fig. 1 shows the generally upward trend in both proposals and awards through 2012. The drop-off in proposals in 2013 was likely due to the annual conference’s cancellation caused by heightened DOD restrictions on conducting conferences—thus limiting the extent of the solicitation’s distribution—while the reduced number of awards in 2013 was most likely due to the effects of sequestration in the DOD.

![Figure 1: Proposals (n=319) and Awards (n=128) through the Acquisition Research Program 2007–2013.](image-url)
Methodology
We conducted a systematic review of research proposals received over the last seven years using content analysis to identify patterns and themes. Specifically, we replicated the methodology used in three prior studies. Carter and Ellram [12] analysed articles published in *Journal of Supply Chain Management*, and Elder [13] and Miranda and Spann [14] conducted separate analyses of articles in *Acquisition Research Journal*.

We independently reviewed the text of each research proposal to identify major characteristics of each. These characteristics were taken from those identified in the prior studies [12-13]: research subject category (Table 2), type of research (Table 3), research design (Table 4), and type of data analysis (Table 5). We separately coded and then compared scorecards, with conflicts resolved through subsequent discussion and mutual agreement. We also gathered demographic, institutional (e.g., university, researcher’s departmental affiliation, for-profit or nonprofit institution), and funding data from the proposals.

<table>
<thead>
<tr>
<th>Subject Categories</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquisition Strategy</td>
<td>Big picture views in acquisition strategy such as outsourcing, privatization, and cooperative acquisition</td>
</tr>
<tr>
<td>Analysis &amp; Decision Making</td>
<td>Analysis models in decisions, cost analysis, and budgeting</td>
</tr>
<tr>
<td>Contracting</td>
<td>Auctions, buyer–seller relationship, contract management, contingency contracting, source selection, acquisition planning, contract incentives, etc.</td>
</tr>
<tr>
<td>Cost, Schedule, Performance</td>
<td>Management, estimation, activity-based costing, budget, cost as an independent variable, cycle-time, estimate at completion, earned value management, total ownership cost, management reserves, performance measurement and metrics, better buying power, efficiency, productivity, etc.</td>
</tr>
<tr>
<td>Defense Industry</td>
<td>Commercial off-the-shelf, non-developmental items, small business, commercial issues, industry base, etc.</td>
</tr>
<tr>
<td>International</td>
<td>Cooperative acquisition, foreign military sales, globalization, transatlantic, etc.</td>
</tr>
<tr>
<td>Interoperability</td>
<td>DOD Architecture Framework, enterprise architecture, integration, quality assurance, quality improvement, trade-off, technology integration, system architecture, systems-of-systems, and design</td>
</tr>
<tr>
<td>Logistics</td>
<td>Electronic business, depots, life-cycle, logistics reform, supply chain, performance-based logistics, technology performance risk index, etc.</td>
</tr>
<tr>
<td>Management &amp; Organizational Issues</td>
<td>Leadership/management theory, organizational reconstruction, organizational strategy, workforce development, etc.</td>
</tr>
<tr>
<td>Policy &amp; Regulations</td>
<td>Encompasses acquisition regulation and public policy issues, etc.</td>
</tr>
<tr>
<td>Risk Management</td>
<td>Field testing, battle labs, technical performance measures, etc. Risk, risk models, metrics, test and evaluation, technical evaluation</td>
</tr>
<tr>
<td>Technology</td>
<td>New research endeavors not directly related to interoperability or program fielding. These include: anti-tamper, information technology, innovation, knowledge management, net-centric, etc.</td>
</tr>
</tbody>
</table>

*Table 2: Proposal Subject Categories [From 13-14].*
### Research Definition

<table>
<thead>
<tr>
<th>Research</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploratory</td>
<td>Research that makes observations for the purposes of developing theories, but leaves testing of the theories for other studies.</td>
</tr>
<tr>
<td>Hypothesis</td>
<td>Research that introduces and then tests research hypotheses or propositions.</td>
</tr>
<tr>
<td>Literature</td>
<td>Research that reviews and synthesizes existing literature, the result of which is the development of a framework, propositions, or normative prescriptions grounded in existing literature.</td>
</tr>
<tr>
<td>Methodology</td>
<td>Research which reviews methodologies in the field. A “how-to” proposal.</td>
</tr>
<tr>
<td>Normative</td>
<td>Research where literature might be cited, but the point of the inclusion is to support the opinions/assertions of the author.</td>
</tr>
</tbody>
</table>

#### Table 3: Types of Research [From 12].

<table>
<thead>
<tr>
<th>Research Design</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archival</td>
<td>Research is designed with the primary use of data that already exists and has been collected by others.</td>
</tr>
<tr>
<td>Case Study</td>
<td>Research is designed to use in-depth data gathered from a specific program or event.</td>
</tr>
<tr>
<td>Experiment</td>
<td>Research is designed to collect data through an experimental process.</td>
</tr>
<tr>
<td>Interviews</td>
<td>Research is designed to collect data through interviews with subject matter experts.</td>
</tr>
<tr>
<td>Modelling</td>
<td>Research involves proposing or developing a simplified framework designed to illustrate complex processes, often but not always using mathematical techniques.</td>
</tr>
<tr>
<td>Surveys</td>
<td>Research is designed to collect data through the use of surveys.</td>
</tr>
<tr>
<td>Topic Presentation</td>
<td>There is no discernable research design methodology.</td>
</tr>
</tbody>
</table>

#### Table 4: Types of Research Design [From 13].
### Data Analysis Definition

<table>
<thead>
<tr>
<th>Data Analysis</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anecdotal</td>
<td>Based on incidental observations or reports rather than a systematic evaluation</td>
</tr>
<tr>
<td>Comparative Analysis</td>
<td>Utilizing comparison as a method of analysis (e.g., outlining results with a comparison between DOD restricting to that of a civilian organization)</td>
</tr>
<tr>
<td>Content Analysis</td>
<td>A detailed systematic evaluation of a particular body of material for the purpose of identifying patterns, themes, or biases</td>
</tr>
<tr>
<td>No Analysis</td>
<td>No discernible analysis proposed</td>
</tr>
<tr>
<td>Statistical Analysis</td>
<td>Uses statistical methods to analyze data. These methods include ANOVA, correlation analysis, regression analysis, descriptive statistics, and factor analysis.</td>
</tr>
</tbody>
</table>

**Table 5:** Types of Data Analysis [From 13].

### Data Presentation

The following section gives top-level summary results of our analysis of proposals, along with comments on potentially significant points. We include comparisons with the findings of prior studies [13-14] (hereafter referred to as “prior studies”) where appropriate.

**Proposal Content.** Here we present results for research topics, types of research, research designs, and types of data analysis.

For all of the figures below, the total number of proposals is 319 and the total number of awards is 128.

Fig. 2 shows the frequency of proposals and awards by subject. Of note is the large number of proposals and awards in just four subjects; almost 60% of the proposals occur in 33% of the subjects. “Contracting” and “Logistics” are recognized as traditionally mainstream defense acquisition topics. The large number of proposals and awards in “Analysis & Decision Making” and in “Cost, Schedule, Performance” may reflect researcher and evaluator perceptions of perennially problematical outcomes in defense acquisition. Less frequent attention to niche topics such as “Defense Industry” and “International” possibly reflects a belief that acquisition’s problems lie mainly within the public sector and are mainly domestic in nature. These results have little in common with the findings of prior studies, in which “Technology” and “Acquisition Strategy” were frequently occurring topics.

The large number of proposals in “Contracting” may have significance for public procurement, as most would agree that contracting is the defense acquisition topic most closely related to public procurement.

An interesting point is that almost half of the proposals in “Interoperability” received awards, indicating either the evaluators’ high levels of interest or the high level of quality of proposals in this area, or perhaps both.
The relative frequency of research proposal types (Fig. 3) mirrors that found in the prior studies. Elder [13] noted that “Methodology” and “Normative” types represent practitioner-oriented research, while the other three types are typically associated with scholarly research. These results indicate a distinctly pragmatic bias towards investigations in defense acquisition.

The large number of proposals and awards in the “Methodology” category reflect biases towards applied “how to” research to solve some acquisition-related problem. The high frequency of “Normative” proposals suggests that researchers have definite views on the problems to be solved and how to solve them. Interestingly, more awards were made for these two categories, suggesting that evaluators prefer proposals that seem to offer definitive answers to problems—what should be done and how to do it—over those with more scholarly rigor that seek foundational understandings.

The infrequency of proposals in the “Hypothesis” and “Literature” categories suggests a general paucity of data and scholarly literature in defense acquisition.

Fig. 4 shows that more proposals indicated no discernable research design than any other type, which corresponds to findings in the prior studies. Overall, this confirms a relative immaturity in the state of defense acquisition.
research. Still, this category received the second-highest number of awards. This suggests that evaluators may be at least as interested in new ideas and approaches for addressing acquisition issues as in the scholarly rigor underlying those ideas and approaches.

Rigorous designs that might be most useful in generating new knowledge (e.g., surveys, interviews, and experiments) were proposed least frequently. This may also reflect a paucity of useful data for such designs or difficulties in gaining access to sources of defense acquisition data, which may be restricted due to security concerns.

Also of note is the high frequency of designs that involve modelling, which was not found in the prior studies. Many of these proposals sought to provide conceptual or analytical “frameworks” which would provide a basis for addressing some issue or solving some problem. Researchers often proposed to validate these models using some limited data, with the hope that, if the proposal was accepted for award, DOD agencies would be willing to use them more extensively. That the “Modelling” category received the most awards suggests that evaluators recognize that the DOD is searching for useful frameworks to understand and solve acquisition problems.

Fig. 4: Proposals and Awards by Type of Research Design Proposed 2007–2013.

Fig. 5 depicts the frequency of proposals and awards according to type of data analysis. At first glance, the large number of proposals and awards in the category of “Statistical Analysis” may appear contrary to trends identified up to this point, which indicate a predominance of practitioner over scholarly research orientations. This category includes, however, simple descriptive and graphical analysis as well as sophisticated regression and ANOVA techniques; thus, this category may not be a good discriminator of research rigor. A stronger indication may be given by the combined frequencies of proposals in the categories of “Anecdotal” and “No Analysis.” These two categories suggest less rigorous scholarship and thus a stronger practitioner orientation. Still, evaluators valued these proposals; roughly one of every four was awarded.
Fig. 5 shows the distribution of proposals for various types of institutions. As the DOD sponsor had hoped, civilian universities—known as standard-bearers for high-quality scholarly research—are by far the largest contributors of proposals. Defense universities\(^1\) were robustly represented, mainly because they all have faculty members who are intimately involved in research and education activities related to defense acquisition.

Of the total proposals from civilian (i.e., non-defense) universities, a large proportion came from only a few schools (Fig. 7). The largest number came from the University of Maryland, an unsurprising result given the significant capabilities and interests in acquisition research in its Center or Public Policy and Private Enterprise, led by Jack Gansler. The other top-proposing schools—University of California Irvine; Stevens Institute of Technology;

\(^1\) Defense universities submitting proposals included the following: in the USA, the Naval Postgraduate School, the Air Force Institute of Technology, the Air Force Academy, and Defense Acquisition University; in the UK, the Defense Academy of Cranfield University; and in Germany, the Bundeswehr University Munich.
University of Tennessee; Purdue University—all submitted proposals in multiple years. This distribution suggests that defense acquisition is something of a niche topic of interest to only a relatively few institutions; similar statements have been made about public procurement as a topic of research interest [5].

**Figure 7:** Top Proposing Universities 2007–2013.

Fig. 8 gives the distribution of proposals by university researchers’ departmental or school affiliation. Considering that the annual solicitations sought proposals for “management and policy research,” this distribution is not surprising. The number of proposals from engineering and information sciences departments suggests that management is a significant sub-discipline within those departments (e.g., engineering management, information technology management).

**Figure 8:** University Department of Lead Researchers, Including Both Universities and Defense Universities 2007–2013.

*Note:* The “Other” category includes non-university institutions.
Fig. 9 depicts the annual distribution of proposals according to their sources. The generally increasing trend of university proposals (except for 2013, which perhaps is an anomaly, as discussed earlier) indicates that the program is accomplishing its objective of stimulating research interest outside of DOD. The predominance of university proposals over those from for- and non-profit entities is also a positive sign.

The increasing numbers of DOD university proposals since 2009 likely reflect a procedural change more than any substantive trend. Prior to 2009, NPS researchers submitted their proposals in response to a separate solicitation, and after that date, they submitted proposals in response to the annual BAA.

Discussion
On balance, these results present a mixed picture of the state of defense acquisition research. While trends seem generally positive in terms of numbers and awards, they represent a fairly limited number of institutions. Seven institutions represent 60% of proposals and 70% of awards. This suggests that acquisition is a limited niche research topic.

In the section that follows, we explore some possible reasons for this condition. We perceive that defense acquisition has unique characteristics that may separate it from the mainstream of academe, and thus also from the mainstream of scholarly research.

Acquisition as a Military Function
It may be argued that acquisition—at least in the United States—is primarily a military rather than a technical or managerial administrative activity. Acquisition is controlled by the military and is configured as a distinctly military function in at least two significant ways. First, for the most part, the locus of acquisition is within the DOD and the Departments of the Army, Navy, and Air Force. Second, the majority of key program managers are uniformed military officers [15]. The most common explanation for this is that the operational experience of the uniformed officer enables him or her to understand and respond to the needs of the operational user [16].

Acquisition as an Interdisciplinary Activity
Second, as an interdisciplinary activity, defense acquisition lacks a central defining scholarly discipline: Is it mainly for study by engineers, management theorists, or political scientists? Acquisition is often organizationally associated with research and technology activities. For example, Pentagon acquisition executives also have responsibilities for their services’ research and development activities, hence, titles such as Assistant Secretary of the Navy (Research, Development, and Acquisition) and Under Secretary of Defense (Acquisition, Technology, and Logistics). Most writers locate the roots of contemporary defense acquisition in the management of large complex weapons projects, such as the Manhattan Project and aerospace projects, during and following World War II [17, pp. 4-5; 18, p. 13]. Regarding management, the DOD’s general preference for managerial and business approaches in acquisition has been well documented [19]. The DOD’s requirements for qualification in certain
acquisition career fields include at least 24 semester credit hours in business-related subjects [20]. Fox [21] has noted, however, that acquisition’s historical preference for technical disciplines may have overshadowed attention to business concerns. Finally, Mayer and Khademian [22] note the strong political dimension of defense acquisition, partly because of the huge number of dollars at stake. It thus continues to attract the attention of political scientists as an object of research (for example, see [23]).

An interdisciplinary bias is indicated by graduate degree programs for acquisition officers. Each year, the services pay for a certain number of officers to attend graduate school on a full-time basis to obtain master’s degrees in a variety of disciplines. In fiscal year 2008, for example, the Army sent about 75 of its acquisition officers to graduate school to pursue degrees in engineering, computer science, information systems, business, and management [24].

While acquisition’s interdisciplinary character may be an advantage in terms of effective practice, it may have drawbacks in terms of research. If one discipline doesn’t “own” acquisition, a critical mass of disciplinary scholarship will be lacking.

Acquisition: Training, not Education

After World War II, as Cold War weapons programs grew in scope, complexity, and cost, the DOD recognized the need for specialized management skills among its officers and civilian members. Eventually this led to the establishment of professional training programs in functional areas such as contracting, logistics, production management, and project management. In 1990, as part of DAWIA, a Defense Acquisition University was established and given responsibilities for the professional development of the acquisition workforce. By far, most activity to date has occurred in the area of training. Much less attention has gone to acquisition education and research. There are a few textbooks dedicated to defense acquisition, and both the Navy and the Air Force have instituted acquisition management curricula at their respective graduate schools. Acquisition and procurement research has received some attention over the years [25-27], but there is little evidence of interest in developing what might be called “acquisition theory.”

To summarize, defense acquisition proceeds largely as an interdisciplinary field of professional practice with neither an explicit underlying theory nor much evident interest in the development of theory. The result is a general lack of any activities that could lead to an understanding of the important questions and enduring themes that might define acquisition as a unique area of research.

Conclusion

We conclude with several questions that remain unanswered from this analysis. Has the Acquisition Research Program accomplished its goals? Has scholarly interest in defense acquisition actually been stimulated, both among faculty and graduate students at academic institutions? Is there now a wider scholarly network of interest in acquisition research? Has new and useful knowledge been generated, and if so, is it being applied to solve acquisition problems? Most importantly, have the outcomes of defense acquisition been improved through research?
References


Acknowledgements

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Protesting Local Government Procurements in the United States

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Accountability in government purchasing has become increasingly important given the number of complex procurement solicitations combined with the fact that companies are investing more time and money into bid preparation in order to win government contracts. Local government accountability is especially important since state and local government purchases account for almost 60% of the roughly $3 trillion spent on public procurements in the US.

For decades most local governments have been required to follow public procurement procedures designed to ensure fair and cost effective government purchases. In order to protect the integrity of the procurement process most localities permit companies that believe they have been treated unfairly by the locality during the award of a contract to file a bid protest.

A bid protest is a formal objection to the formation or award of a government contract. It provides an unsuccessful bidder the legal right to challenge the award of a public contract on the grounds that the public body failed to follow the required procurement procedures. Common reasons for protests are failure to award to the lowest responsive bid by a responsible bidder, failure to follow the solicitation’s evaluation criteria, and failure to enter into meaningful negotiations. If the protest is valid, then the award of the contract may be cancelled and the locality forced to start the procurement over again. Bid protest procedures offer the chance of a relatively low cost and timely resolution to procurement disputes by allowing aggrieved bidders to make a challenge directly to the locality issuing the solicitation before having to file an action in court. Confidence in the procurement process is reassured by allowing companies to formally challenge mistakes in the procurement process and requiring localities to answer to those challenges.

This paper examines protest procedures at the local level (county, city, town) by focusing on the protest procedures in Virginia. It discusses the process of filing a protest under the Virginia Public Procurement Act and draws comparison and contrasts with the Model Procurement Code and other procurement regimes in states in the US. In particular, it examines issues such as access, procedural requirements, remedies, and judicial review. Protest procedures at the local level must strike a balance between providing a remedy for violations of the procurement rules and protecting the efficient purchase of essential goods and services. For simplicity, the term ‘bid protest’ is used throughout this paper to refer generally to any type of procurement challenge, and includes protests by bidders or offerors.

LEGAL BACKGROUND

Protest procedures at the local level are generally guided first and foremost by state procurement statutes. This is especially true for states following Dillon’s Rule, where local governments only have those powers that are expressly conferred upon them by the state legislature or those that may be necessarily or fairly implied from expressly granted powers. In Virginia, state and local government purchases are regulated by the Virginia Public Procurement Act (“VPPA”). The VPPA is a comprehensive set of procurement laws that was enacted by Virginia’s state legislature in 1981 in an attempt to standardize the purchase of goods and services by state agencies and local governments. The VPPA includes a protest procedure that automatically applies to Virginia’s local government procurements.

Virginia, along with several other states and hundreds of local jurisdictions in the U.S., adopted its procurement laws in accordance with the general principles set forth in the Model Procurement Code (“MPC”). The MPC is a model comprehensive procurement law that is published by the American Bar Association (“ABA”) and is optional for state and local governments to adopt. Article 9: Legal and Contractual Remedies of the MPC
includes a procurement protest procedure. While the MPC is not a law itself, it is useful model to consider when comparing protest procedures around the country because many states have adopted the MPC’s principles.

All U.S. states, however, do not regulate procurement in the same way. As a result, local protest procedures vary from state to state and can even vary from locality to locality within some states. In Alabama, for example, there is no formal protest procedure codified in state law. Other jurisdictions may have local rules which supplement or differ from the state code provisions on procurement protests. A good resource on protest procedures across the fifty US states is the ABA’s Guide to State Procurement: A 50-State Primer on Purchasing Laws, Processes and Procedures.

It is also important to review any applicable local ordinances as there may be local exceptions to state code even in those states with comprehensive procurement laws. In Virginia, for example, the majority of the VPPA’s provisions, including its protest procedures, do not apply to towns under 3,500. The VPPA also permits local governments to adopt alternative procurement policies “which are based on competitive principles and which are generally applicable to procurement of goods and services by such governing body.” While most Virginia localities follow the protest procedures set forth in the VPPA, Henrico County Virginia, for example, has imposed an additional local requirement that no party who has unsuccessfully protested a decision to award may protest the subsequent award of the same contract.

**LIMITATIONS ON WHO MAY PROTEST**

In Virginia, only companies that submitted a bid or offer in response to a local government solicitation may protest. There is a limited exception for potential bidders on a sole source or emergency award, but otherwise, companies that did not submit an actual bid have no standing to protest. Moreover, the actual bid submitted must be in compliance with all the requirements of the local solicitation or the unsuccessful bidder will not have standing to protest. *Corrections Products Company v. City of Alexandria*, No. CL06002308 (City of Alexandria Cir. Ct. Nov. 3, 2006). Several states outside of Virginia also restrict standing to actual bidders.

Other jurisdictions expand standing to allow actual or prospective bidders to protest. The MPC, for example, permits “any actual or prospective bidder who is aggrieved in connection with the solicitation or award of a contract” to protest. Typically a prospective bidder must demonstrate that there was a direct economic interest that was harmed and that the bidder was likely to actually have won the contract. Accordingly, a prospective bidder would be permitted to file a protest on the grounds that it would have submitted and won a bid but for the locality’s failure to properly advertise.

A limited number of states go so far as to permit citizen taxpayers to bring a common law action challenging a public contract awarded in violation of public procurement law. A Pennsylvania court, for example, has held that a taxpayer may bring an equity suit to enjoin the award of a contract because the bidding requirements were not followed, even though the taxpayer otherwise lacked standing under Pennsylvania’s procurement code. Virginia, however, does not permit tax payer challenges. The Virginia Supreme Court held in *Concerned Taxpayers v. County of Brunswick*, 249 Va. 320, 455 S.E.2d 712 (1995), that a citizens group could not bring a law suit to challenge a local government’s decision to award a contract, either under the VPPA or under common law.

Limiting access to those who have a direct stake in the outcome involves an important balance of public interests. On the one hand, expansive standing rules help ensure the integrity of the procurement process by allowing valid complaints to be raised. On the other hand, local governments do not have the resources or staff to referee disputes between rival companies. Standing rules also help avoid improperly politicizing local procurement by restricting challenges to those companies that have a direct stake in the outcome. Standing rules act as a gatekeeper to keep out frivolous and obstructive complaints.

**TIME CONSTRAINTS**

Unsuccessful bidders in Virginia only have ten days after the award or the announcement of the decision to award, whichever occurs first, to submit their protest in writing to the local government that issued the solicitation. If the protest is based on information contained in public records then the protestor has 10 days after the records are made available for public inspection. Under the VPPA, localities are required to give public notice of the award or
the announcement of the decision to award in the manner prescribed in the terms or conditions of the solicitation. Often localities in Virginia will therefore specify in the solicitation that notice of intent to award will be published on their website or posted in the purchasing office. That way the clock starts ticking as soon as the notice is posted on the website.

Many other state and local protest procedures also limit the time in which a company has to file a protest. The default provisions of the MPC give protesters 14 days to file after such aggrieved person knows or should have known of the facts giving rise thereto. Some states like Colorado and Maryland limit the protest time to 7 days while Iowa only allows five days to protest. In addition, there are some localities in states such as Florida, which require an initial notice of protest to be filed within a shorter time period before the clock starts running on the actual filing of the protest. These notice requirements can be as short as 72 hours after the award.

The purpose of establishing short filing deadlines is to ensure the orderly functioning of local government. The unsuccessful bidder has a responsibility to quickly bring a challenge so that the government can proceed with the timely purchase of essential goods and services. Especially as localities often provide essential services in a more direct manner than the state or federal government, local governments need security in their purchases without being held up by the threat of a challenge later on.

THE PROTEST PROCESS

Virginia, along with most states, requires protestors to file their protest in writing with the local government that solicited the procurement or to an official designated by that local government. At the local level, this means that protests are usually filed with the head of the city or county purchasing department. Protesters are generally not permitted to proceed directly to court. There is a limited exception in Virginia permitting direct court actions for challenges based on the refusal or disqualification from participation in a bid, a determination that the bidder is non-responsible, or the denial of withdrawal of a bid.

The VPPA requires that the protest include the reasons for the protest and the relief being sought. Typical reasons for protesting are failure to advertise as required by law, failure to award to the lowest responsive bid by a responsible bidder, failure to follow the solicitation’s evaluation criteria, lack of proper documentation, failure to enter into meaningful negotiations, and errors in cost evaluation. Protests involving construction contracts with high values and significant bid preparation costs will often be based on low bidder claims that its low bid was erroneously determined to be nonresponsive or higher bidder claims that the low bidder was nonresponsive.

There are certain challenges, however, that the VPPA specifically prohibits. For example, companies are not allowed to protest on the basis that the selected bidder is not a responsible bidder. The rationale behind this rule is to avoid the situation where a rival company tries to challenge the experience of a competitor and the locality is stuck in the middle to act as the referee. The VPPA also prohibits protests to challenge the validity of the terms or condition of the solicitation. For example, a company could not challenge on the grounds that the specifications should have been different or that a legal insurance requirement should be removed. While the MPC does not expressly contain similar such limitations, other localities may exclude certain subjects from being the basis of a protest. Louisiana’s protest rules, for example, prohibit protests challenging the cancellation of a solicitation.

In accordance with the MPC, the relief available under the VPPA depends on whether or not an award has already been made. If an award has not yet been made, then the relief shall be a cancellation of the award and revision to comply with the law. If an award has been made, but performance has not yet begun, then the performance of the contract may be enjoined. When award has been made and performance already begun, then the public body may declare the contract void upon a finding that so doing is in the best interest of the public. In addition, if a protest is filed and the locality determines a mistake was made then the locality has the option under 2.2-4319 to cancel all the bids and simply start over. A circuit court in Richmond has held that the City of Richmond was able to cancel an award and start over even after receiving an untimely protest that it considered meritorious.

Virginia does not expressly allow recovery of bid preparation costs. A successful protest will most typically result in cancellation of the improper award without any cost recovery to the company that pursued the protest. Other states vary as to whether protestors are allowed to recover costs or be awarded monetary damages. The MPC, for example, allows a successful protestor to recover the reasonable costs incurred in connection with the solicitation
provided that the protest is sustained and the protesting bidder should have been awarded the contract. The MPC does not allow recovery of attorney’s fees or lost profits to successful bid protestors. Colorado, on the other hand, goes as far as to permit successful challengers to recover a reasonable profit.

Once a valid protest is made many states provide for an automatic stay of the procurement. In Virginia, localities cannot take further action on the contract unless the bid will expire or a written determination is made that proceeding without delay is necessary to protect the public interest. If injunctive relief is granted by a court, then upon request of the locality, the court can order the bid protester to post reasonable security bond to protect the locality.

A limited number of states have a formal debriefing process to explain how successful or unsuccessful bidders satisfied or failed to satisfy the solicitation’s criteria. Even when not required by law, some jurisdictions provide an informal debriefing process as a means to stop bid protests before they start. Virginia does not have a formal debriefing requirement.

THE APPEALS PROCESS

After receiving a protest, the locality is required to respond with a decision in writing within ten days stating the reason therefor. The decision becomes final and binding unless the unsatisfied bidder then appeals within ten days either (1) to an administrative body, if available or (2) by instituting legal action in the appropriate court. Any appeal before an administrative body is at the option of the protestor. However, not all local governments offer an administrative body to hear protests because, unlike state governments, they do not have the volume and size of procurements or the resources or staff to create a standing administrative body. Nevertheless, if the protestor chooses to first appeal to the administrative body, it must then exhaust those administrative remedies prior to initiating any court action. Assuming the administrative body denies the protest again, the unsatisfied protestor then has 30 days to file an appeal in court.

Once the locality has denied the protest, and any initiated administrative appeals procedures have been exhausted, then an aggrieved bidder in Virginia may bring an appeal in court. The standard of review applied by the court is based on whether the proposed award or the award is not an honest exercise of discretion, but rather is arbitrary or capricious, or is not in accordance with the Constitution of Virginia, applicable state law or regulation, or the terms and conditions of the invitation to bid or request for proposal. The standard of review in many other states is also based on whether the decision to award was arbitrary and capricious. There is a special standard of review in Virginia, however, if the challenge is based on allegations of fraud, corruption, or any other violation of the ethics provisions of the VPPA. The standard in such cases is whether or not there is probable cause to believe a violation has been committed.

The typical judicial relief afforded to a successful protestor is to void the award and order the public body to start the procurement over from scratch. A directed award to the protestor is very unlikely. Although Virginia law does provide that in the event the apparent low bidder, having been previously determined by the public body to be not responsible, is found by the court to be responsible, the court may direct the public body to award the contract to such bidder in accordance with the requirement of Va. Code § 2.2-4364.

Absent a violation of the law, courts in Virginia are generally willing to defer to the policy decisions of local governments when awarding public contracts. The Supreme Court stated in Taylor v. County Board of Arlington Cnty., 189 Va. 472, 53 S.E.2d 34 (1949):

> When the decision of the authorities is based upon a fair and honest exercise of their discretion, it will not be interfered with by the courts, even if erroneous. Courts do not in such cases substitute their judgment for the judgment of the body to which the decision is confided. Interference by the courts is limited to cases in which the public body has proceeded illegally or acted arbitrarily or fraudulently.

Filing a protest is a prerequisite to challenging a procurement violation. In a recent case, Charlottesville Area Fitness Club Operators Association, et al v. Albermarle County Board of Supervisors, 285 Va. 87, 737 S.E.2d 1
(Va., 2013), the Virginia Supreme Court denied plaintiff’s attempt to use declaratory judgment to challenge a violation of the VPPA. The Court stated that:

The rights and obligations conferred by the VPPA did not exist at common law and were created entirely through the enactment of VPPA’s statutory scheme. Concerned Taxpayers v. County of Brunswick, 249 Va. 320, 330, 455 S.E.2d 712, 718 (1995). These remedies are exclusive and do not provide actual or potential bidders with any remedy independent of those created by the VPPA. Sabre Constr. Corp. v. County of Fairfax, 256 Va. 68, 73, 501 S.E.2d 144, 147-48 (1998). Because the VPPA “constitutes a waiver of public bodies’ sovereign immunity” and “is in derogation of common law,” its provisions “must be strictly construed.” Id. at 73, 501 S.E.2d at 147.

CONCLUSION

Bid protests help hold local governments accountable to the procurement rules. Cost effective and impartial expenditures of public funds are reassured by permitting unsuccessful bidders to challenge the award of a contract made in violation of the procurement rules. Bid protest procedures offer a relatively low cost and timely resolution to procurement disputes by allowing aggrieved bidders to make a challenge directly to the locality issuing the solicitation before having to file an action in court. Transparency and confidence in the procurement process is increased by allowing companies to formally challenge mistakes in the procurement process and requiring localities to answer to those challenges.

1 CORRUPTION IN MUNICIPAL PROCUREMENT: FORECLOSING CHALLENGES OF DISAPPOINTED BIDDERS—AUGUSTA, GEORGIA, AND THE NEED FOR REFORM


Prior to the VPPA, Virginia’s laws regulating procurement were scattered throughout the Virginia Code in a patchwork of varied and often inconsistent provisions. Virginia Procurement Law Study: Final Report (1980). There was a general lack of uniformity regulating state and local procurements as well as differing standards depending on the character of the procurement. There was no formal protest procedure before the VPPA was enacted. Unsuccessful bidders had the option of filing a law suit alleging capricious or criminal conduct.

The 17 states that have adopted are: Kentucky, Arkansas, Louisiana, Utah, Maryland, South Carolina, Colorado, Indiana, Virginia, Montana, New Mexico, Arizona, Alaska, Rhode Island, Hawaii, Oregon and Pennsylvania. According to “State and Local Government Procurement: A Practical Guide, National Association of State Procurement Officials, 2008.”


Va. Code §2.2-4343(9)-(11)

Several mandatory provisions of the VPPA cannot be changed even with alternative policies. Va. Code § 2.2-4343(12)

Henrico County code section 16-49(a)

Va. Code §2.2-4360


Florida law.

Va. Code §2.2-4364.

Va. Code §2.2-4360.

Va. Code §2.2-4360.


Va. Code § 2.2-4362.

Va. Code §2.2-4364(D).
Va. Code § 2.2-4360.
Va. Code § 2.2-4360(C).
The Model of Quasi-Corruption: Public Procurement Case

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ABSTRACT The paper concentrates on the issues of Governance in Public Sector and makes a contribution to the development of the typology of principal-agent models. Until now, the researchers’ efforts were concentrated on the development of the classical principal-agent model and the model of efficient corruption. The paper completes the construction of the typology of principal-agent models, having introduced into consideration a model of ‘quasi-corruption’ based on assumptions of mala fides of the Principal and bona fides of the Agent. The model is applied to examine public procurement issue connected with the declining competition in the e-auctions in Russian Federation. Having compared the e-auctions performance and the corruption level in RF, the paper hypothesizes that competition may be limited by both the *mala fide* and *bona fide* public buyer. The first seeks to obtain bribes, the second tries to achieve benevolent goals. The amendments to the Russian Public Procurement legislation have been proposed.

INTRODUCTION

The practice of applying electronic auctions for public procurement has a history whose origins can be determined fairly precisely. Article 18 (“Procurement Methods”) of the Model Law on Procurement of Goods, Construction and Services (hereafter “Model Law”), developed by the United Nations Commission on International Trade Law (UNCITRAL), does not still consider the auction as a valid method of procurement. E-auctions became one practice of public procurement at the beginning of the new millennium, when modern information and communication technologies were developed and disseminated. Brazil was an early adopter, introducing electronic auctions at the end of 2000 [1, p. 4]. The “classical” directive (Directive 2004/18/EC, art. 54) provides legal certainty and specific rules and guidance for their application at European level since 2004, and finally they were introduced into the list of procurement methods by the new version of Model Law two years ago (UNCITRAL Model Law, 2011, art. 27).

In the Russian Federation (hereafter “RF”), the “Law on Placement of Orders for supplies, execution of projects and providing services for State and Municipal Needs” (Federal Law #94-FL, hereafter, “Federal Law” or “PPL”), which came into force on 01.01.2006, considered the open-outcry auction as the primary procurement method and permitted e-auctions for small contracts only. Applying for tenders was forbidden to public entities for the procurement of goods, works, and services included in “The list of goods (works, services), placing orders for supplies (performance rendering) which is carried out through an auction” as issued by RF Government. Of the four basic types of auction (English auction, Dutch auction, Vickrey auction, and requests for quotations [2, p. 702]), PPL required the use of the English auction in open-outcry and electronic form, as well as a request for quotes for the purchase of a small volume. Faced with many cases of the suppliers’ mala fide behavior at open-outcry auctions, Russian lawmakers were forced to replace them completely with e-auctions in 2010 for federal public entities and then in 2011 for other public procurement bodies. The government was convinced that applying e-auctions would help suppliers to become involved in the procurement process, to ensure reducing corruption, and to hinder the possibility of collusion by suppliers, which would subsequently lead to improved competition in auctions and increase the size of price reductions [3, p. 430-431]. Before the introducing of e-auctions the dynamics of competition and price reductions in outcry auctions was as follow [4].

<table>
<thead>
<tr>
<th>Table 1. Performance of open-outcry auctions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competition in the auction (bids/auction)</td>
</tr>
<tr>
<td>2006</td>
</tr>
<tr>
<td>2.78</td>
</tr>
<tr>
<td>Average price reduction (%)</td>
</tr>
<tr>
<td>44.89</td>
</tr>
</tbody>
</table>

In 2010, the first year when e-auctions were applied on a large scale, 142,450 auctions were announced and carried out at three Electronic Trade Platforms (hereafter ETP) specially established in RF; ETP of the Republic of Tatarstan, Moscow ETP, and Sberbank – AST ETP (hereafter, correspondingly, T-tp, M-tp, S-tp).
To assess e-auctions’ performance, the researchers from the Higher School of Economics (Moscow) took a random sample of 32283 auctions in total from each of the three platforms. Data analysis revealed about the same results on any ETP.

**Table 2. E-auctions performance (2010)**

<table>
<thead>
<tr>
<th></th>
<th>M-etp</th>
<th>S-etp</th>
<th>T-etp</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competition in the auction</td>
<td>1.5</td>
<td>1.6</td>
<td>1.8</td>
<td>1.6</td>
</tr>
<tr>
<td>The auction didn’t take place (%)</td>
<td>75</td>
<td>69</td>
<td>71</td>
<td>72</td>
</tr>
<tr>
<td>Average price reduction (%)</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>4.7</td>
</tr>
</tbody>
</table>

Having compared data of Table 1 and Table 2 we cannot fail to notice that competition declined and correspondingly the price reduction decreases.

Consider the problem of auctions which did not take place. There are more than a dozen cases in which PPL recognizes that the auction has not taken place, but practice shows that the main reasons in this case are that there is a single bid or there are no bids at all. In particular, in 2011 the total number of auctions which did not take place due to a lack of bids or receiving a single bid was: in 90% in January, in 86% in February, 87% in March, and 85% in April.

As a rule, there are no bids at an auction if public entity (hereafter terms “public entity”, “contracting authority”, “public buyer” and even “buyer” are synonymous) is incompetent (i.e. unable to set properly the initial price and/or to specify the subject of procurement), so that the number of such cases should decrease as the public entity’s experience in procurement improves. Thus, without a loss of generality, we can consider that auctions do not take place due to receiving a sole bid.

The data in Table 2 were so contrary to the expectations associated with the transition to e-auctions that they were met with distrust by the Federal Antimonopoly Service (the body which is authorized to exercise control in the field of public procurement (hereafter FAS)). However, some later from FAS itself, related to the application of auctions in 2011-2012, confirmed that at least 60% of auctions in that period did not take place.

Thus, the question arises as to why substituting outcry auctions with e-auctions resulted in such significant negative changes in the level of competition. Without a loss of generality, we can assume that in the course of the transition to e-auctions, the collusion problem does not sharpen. Thus, we can conclude that the decline in auction competitiveness from 3.64 in 2009 (Table 1) to 1.6 in 2010 (Table 2) had little to do with conspiracies of suppliers, but rather was caused by corrupt behavior by contracting authorities.

Below, unless otherwise stated, in corrupt behavior the contracting authority agrees to understand its interaction with a supplier as related to giving and receiving bribes. As a rule, bribes during public procurement are obtained as so-called kickbacks: the order is placed at a higher price, whereupon the supplier returns a portion of his surplus to the public buyer.

This said, it is not easy to explain the observed data by corruption itself. On the one hand, there are no clear reasons for corruption to increase in the course of a transition from open-outcry auctions to e-auctions. On the other hand, data in Table 2 do not fit other data on corruption in RF.

Let us consider some empirical data from the Business Environment and Enterprise Performance Survey (BEEPS), a joint initiative of the European Bank for Reconstruction and Development (EBRD) and the World Bank [5, p.31]. The Enterprise Survey is answered by business owners and top managers. The manufacturing and services sectors are primary business sectors of interest (construction, retail, wholesale, hotels, restaurants, transport, storage, communications, and IT). The Enterprise Survey is answered by business owners and top managers. The manufacturing and services sectors are the primary business sectors of interest (services firms include construction, retail, wholesale, hotels, restaurants, transport, storage, communications, and IT). Formal (registered) companies with five or more employees are targeted for interview.

**Table 3. Corruption in public procurement in Russia in 2008-2011**

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of firms that attempted to secure government contract (%)</td>
<td>36.4</td>
<td>26.9</td>
</tr>
<tr>
<td>Those among them that indicated that an unofficial payment was made in the process (%)</td>
<td>39.9</td>
<td>22.9</td>
</tr>
</tbody>
</table>

Thus, about 40% of the companies surveyed in 2008 and less than 23% in 2011 paid bribes for the right to receive the contract (company with 100% state participation are not included in the BEEPS). These figures indirectly confirmed by following data [6].
Table 4. Distribution of responses by enterprise managers in the manufacturing industry to the question, “How often do enterprises of your industry have to give bribes or 'kickbacks' to receive public or municipal orders?”

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Number of firms</th>
<th>Sampling share (%)</th>
<th>Number of firms</th>
<th>Sampling share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practically always</td>
<td>87</td>
<td>8.7</td>
<td>60</td>
<td>6.3</td>
</tr>
<tr>
<td>Often</td>
<td>117</td>
<td>11.7</td>
<td>104</td>
<td>10.9</td>
</tr>
<tr>
<td>Sometimes</td>
<td>142</td>
<td>14.2</td>
<td>215</td>
<td>22.5</td>
</tr>
<tr>
<td>Never</td>
<td>366</td>
<td>36.5</td>
<td>338</td>
<td>35.3</td>
</tr>
<tr>
<td>Hard to respond</td>
<td>290</td>
<td>28.9</td>
<td>240</td>
<td>25.1</td>
</tr>
<tr>
<td>Total</td>
<td>1002</td>
<td>100</td>
<td>957</td>
<td>100</td>
</tr>
</tbody>
</table>

Since it is assumed that the most typical corruption practices occur in the manufacturing sector [7, p. 26], these figures (Table 4) may be considered upper bounds for the level of corruption in Russian public procurement. Thus, the sharp decline in competition in auctions and the significant number of failed auctions (exceeding 60%) cannot be explained by anything other than unscrupulous actions by public buyers restricting competition in favor of a pre-selected “favorite.”

One possible hypothesis for explaining identified inconsistencies involves assuming the existence of “quasi-corrupt” behavior of the contracting authority. In this hypothesis, competition may be limited by both the *mala fide* and *bona fide* public buyer. The first seeks to obtain bribes, the second tries to achieve other goals.

1. METHODS

The natural starting point for modeling corruption in public procurement is a principal-agent model. This model was developed for describing processes in the private sector and understands the agency relationship as “a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent” [8, p. 308]. Accordingly, the principal faces the task of shaping a system of incentives for the agent, in which agent's preference relation, defined by a corresponding set of alternatives, coincides with preferences of the principal. In turn, the starting point for modeling public sector processes is the assumption that to meet public needs, the political elite (principal) delegates some decision-making authority to government agencies or other public entities (agents).

Following Jain [9, p. 105], for this chapter’s framework we understand the political elite as the totality of government, and legislative, and administrative bodies responsible for the development of corresponding regulation rules. Necessary conditions in which the agent's corrupt behavior is possible are as follows [10, p. F633]:

1. Discretionary power: the relevant public official must possess the authority to design or administer regulations and policies in a discretionary manner.
2. Economic rents: the discretionary power must allow extraction of (existing) rents or creations of rents that can be extracted.
3. Weak institutions: incentives embodied in political, administrative, and legal institutions must be such that officials are left with an incentive to exploit their discretionary power to extract or create rents.

Consider the case of public procurement. Within it framework the agent is endowed with a discretionary power and a certain budget to carry out procurement. In this situation two of three conditions of corrupt behavior arise. Let us imagine the situation in which a private individual attempts to corrupt a bureaucrat in order to obtain a government contract [11, p. 187]. In this case agent is considered as a potential “bribee,” and the actual level of corruption is determined by how well the institutions governing the (corruptible) bureaucracy are designed [10, p. F635].

Unlike in the private sector, applying the principal-agent model in the public sector has its own specifics related to the fact that in a democracy, the political elite is also an agent elected to achieve social goals. Thus, the ideal preference order in this case has the society as a whole which we call below the basic principal.

Assume that the basic principal, the principal, and the agent equally identify a set of corresponding alternatives $\mathcal{A}$ and on this set their preference orders $\succ_{BP}$, $\succ_{P}$, $\succ_{A}$ respectively – are defined.

**Definition 1.** We call that the principal (agent) *mala fide* if its preference order is different from the basic principal’s preference order: $\succ_{BP} \neq \succ_{P}$, $\succ_{A} \neq \succ_{BP}$, and *bona fide* if otherwise.

For simplification of the manuscript the symbol $\neq$ is used instead of symbol $\neq$.

From Def. 1, the basic principal, *bona fide* principal and *bona fide* agent seek to maximize social welfare (If the corresponding preference orders may be represented by the utility functions).
In the above mentioned model [11, p. 187], and likewise in models that describe processes in the private sector, the basic assumptions are about the principal’s *bona fides* and agent’s *mala fides*. Such models \( (\succeq_P \equiv \succeq_{BP}, \preceq_A \not\equiv \preceq_{BP}) \) below will be called classical ones.

The classical “principal-agent” model implicitly assumes that the political elite has developed regulatory rules relying solely on the interests of its principal, society. At the same time, consideration of the political elite as an agent hired by the society, naturally leads us to consider politicians as “...maximizing agents who pursue their own selfish interest rather than as benevolent agents seeking to maximize aggregate welfare” [12, p. 48]. Corruption, directly related to activities of the political elite, was called “grand corruption” [13, 1996], unlike petty corruption, which is treated in the classical model.

Grand corruption is identified in societies with different forms of government, ranging from kleptocracy [14, p. 13] to a modern democratic society in which it is manifested as vertical corruption [9, pp. 73-74; 15, p. 20] or is caused by principal’s bounded rationality [16, p. xxiv].

However, if we abandon the assumption about the principal’s *bona fides*, we cannot presume the agent’s *mala fides*. Accordingly, depending on the agent’s goal-setting, three types of “principal-agent” models can be constructed. In the “queue model” [17] and the “auction model” [18] corrupt bureaucrats try to correct preexisting government failures. The initial hypotheses of the models are assumptions about *mala fides* of both: a principal and an agent. These models form the class of “efficient corruption” models \( (\succeq_P \not\equiv \succeq_{BP}, \preceq_A \not\equiv \preceq_{BP}) \) (10, p. F633). Joseph Nye views corruption of some factory managers in the Soviet Union, which gives some flexibility to centralized planning system, as an example of this kind of corruption [19, p. 420]. In models of efficient corruption, an agent’s actions violate accepted rules of regulation that allows us to identify differences in preferences of the principal and agent: \( \succeq_A \not\equiv \succeq_P \).

Nevertheless, the principal can create a system of incentives for the agent, which will warn the latter against taking any action in opposition to existing institutions. This kind of model \( (\succeq_P \not\equiv \succeq_{BP}, \preceq_A \equiv \preceq_{BP}) \) can be called a totalitarian model.

Nathaniel Leff noted how bureaucracies in two countries, Brazil and Chile, responded differently to the policy of price regulation aimed at reducing high inflation [20, p. 315]. In Chile, *bona fide* bureaucrats attempted to suppress price increases for food, hampering development of the market for a significant period of time, unlike Brazil, where such policy was sabotaged.

Samuel P. Huntington also believed that from the standpoint of interests of society’s economic development, effective corruption is preferable: “In terms of economic growth, the only thing worse than a society with a rigid, over-centralized, dishonest bureaucracy is one with a rigid, over-centralized and honest bureaucracy” [21, p. 386].

The chapter completes constructing a typology of principal-agent models, having introduced the model of “quasi-corruption” based on assumptions of *mala fides* of the principal and *bona fides* of the agent \( (\succeq_P \not\equiv \succeq_{BP}, \preceq_A \equiv \preceq_{BP}) \).

Definition 2. *Bona fide* agent’s behavior in institutional conditions created by *bona fide* principal will be called quasi-corrupt behavior. The model that addresses this is the quasi-corruption model.

Let us call the model based on assumptions of *bona fides* of both (principal and agent) the “conflict-free model” \( (\succeq_P \equiv \succeq_A \equiv \succeq_{BP}) \). Then the proposed typology of “principal – agent” models is as follows.

<table>
<thead>
<tr>
<th>Table 5. The Typology of the ‘principal – agent’ models</th>
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<tr>
<td>Agent</td>
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<tr>
<td>Mala fide</td>
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<td>Bona fide</td>
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The proposed typology enables using the following algorithm of modeling corrupt/quasi-corrupt behavior:

- to identify the principal and the agent,
- to model the basic principal’s preference order,
- to use rules of regulation to model the principal’s preference order and prove that it coincides with or different from the basic principal’s preference order,
- to identify the existence of a *bona fide* and/or *mala fide* agents,
- to propose amendments to regulatory rules and to forecast agents’ responses to proposed changes.

The rest of the chapter considers the application of this algorithm to public procurement.
2. THE PRINCIPAL AND THE AGENT IN THE RUSSIAN FEDERATION PUBLIC PROCUREMENT SYSTEM

The process of establishing a public procurement system in the RF can be divided into four stages. In the first stage (1992-1997), many documents designed to be the legal framework for public procurement were enacted. The first was Presidential Decree #826, “On arrangements for the formation of the Federal Contract System,” and the government resolution on its implementation. However, at this stage tenders for public contracts were not mandatory, which is why there was much corruption and improving the legal framework was required.

In the second stage (1997-2006), legal documents for the basis of regulatory system for public procurement were enacted: Presidential Decree #826, “On urgent arrangements to prevent corruption and budget cuts in the organization of purchasing goods for public needs,” and Federal law #97-FL, “On the organization of tenders for the procurement of goods, works and services for public needs.” It should be noted that substantive provisions of these documents (first of all, Presidential Decree #305) were based on the custom of international practice, the Model Law. In particular, open tendering was considered to be the primary procurement method, open and restricted, one- and two-stage tenders, and first-price sealed bid tender (requests for quotations) were allowed.

However, in contrast to recommendations of the Model Law, legislative acts did not allow applying any kind of negotiation for public procurement. Moreover, the above-mentioned legal documents left a significant legal vacuum in the system of public procurement, as their provisions hampered the creation of an adequate monitoring system.

In the third stage (2006 – 2013), the development of national public procurement system was associated with enacting the “Law on Placement of Orders for Supplying Goods, Executing Works, and Providing Services for State and Municipal Needs”.

Let us consider the major changes in the regulatory framework of public procurement of the RF, related to the adoption of Federal Law, in terms of their role in opposition to the realization of conditions for corrupt behavior [10, p. F633].

In order to limit the discretionary power of contracting authorities and to prevent them from rent-seeking:

- extremely low price thresholds were established;
- restricted tenders (except involving information regarded as state secrets) and two-stage tenders were prohibited;
- negotiation procedures had not been allowed;
- qualification/reputation criteria were prohibited (and later were limited);
- there were no mechanisms to reject abnormally low bids;
- reverse price auctions were selected as a preferred procurement method, mandatory for goods and services included in the special auction list (hereafter “Auction List”).

Among the measures aimed at strengthening institutions, the following were offered:

- A uniform procurement law was introduced for all government levels (federal, regional, municipal);
- the Ministry of Economic Development (Coordinator) was authorized to develop policy in the public procurement and the Federal Antimonopoly Service – to be a Monitor of the public procurement;
- the powerful information system was created and developed;
- severe penalties for violations in the public procurement were introduced;
- a temporary ‘embargo’ for signing the contract based on the results of the tenders was introduced.

As a result, the Russian Federation developed a system of regulation of public procurement with the aggregate Principal consisting of political and legal elite, Coordinator and Monitor and the aggregate Agent consisting of regional public procurement authorities and bodies governed by public law.

To understand the mechanism of RF public procurement system, we consider its simplified model:

- based on public discontent with corruption, political elite forms its request for the anti-corruption regulations,
- based on public discontent with corruption and established public policy, legislator takes an appropriate legislation,
- political elite appoints federal bureaucrats to implement the legislation,
- federal bureaucrats coordinate and monitor regional bureaucrats (there are 83 regions in the RF including two largest cities: Moscow and St. Petersburg),
- the last coordinate and control the relationships between contracting authorities and suppliers.

Fig. 1 illustrates the above stated mechanism.
As implementation of the Federal Law became increasingly apparent that it is impossible to achieve within the purposes for which it was adopted. We say about efficiency of public procurement spending (Table 2), expanding opportunities for the participation of individuals and legal entities in public procurement (Table 3), development of bona fide competition and preventing corruption (the article’s subject).

After a long debate in society and government the PPL was substituted by the Federal Law № 44-FZ “On the contractual system used by federal, regional, and municipal governments to procure requisite works, goods, and services”. The fourth stage of the Russian public procurement system development has started from the beginning of 2014.

3. MATHEMATICAL MODELLING OF PRINCIPAL’S PREFERENCE ORDER

Let us consider a contracting authority seeking to procure an indivisible good. Suppose that there are no reasons for single-source procurement. In this case, in accordance with Russian public procurement legislation, he can award a contract by the auction (open English e-auction – always, requests for quotations – for relatively small contracts) or by the open tender.

To formalize the subject of procurement, let us use Lancaster’s hypothesis [22, p. 134], according to which in the decision to acquire goods, the buyer evaluates not so much the utility of goods but rather a finite number of their individual characteristics.

H1 (Hypothesis 1). The buyer is assumed to be able to formalize the supplied good as a bundle of its specifications (for the simplicity reasons only, let us include into the bundle the time of delivery, volume and duration of the warranty, operation and, may be, utilization costs and so on)

\[ x = (x_1, x_2, \ldots, x_n), \quad x_i \in D_i, \quad i = 1, 2, \ldots, n, \quad x \in D \subseteq D_1 \times D_2 \times \ldots \times D_n, \]

and to point out the feasible sets \( \tilde{D}_i \) for every specification:

\[ x_i \in \tilde{D}_i \subseteq D_i, \quad i = 1, 2, \ldots, n, \quad x \in \tilde{D} \subseteq \tilde{D}_1 \times \tilde{D}_2 \times \ldots \times \tilde{D}_n, \]

here the Cartesian product \( A \times B \) of sets \( A \) and \( B \) is the set of all ordered pairs \( (a, b) \), where \( a \in A \) and \( b \in B \).

In industries with a short life cycle of technology the adequacy of the hypothesis H1 is provided by carrying out multi-stage (possibly, negotiated) procurement procedures. Such procedures are provided by the international procurement legislation (Model Law, art. 27, 1, e-h) and not provided by the PPL.

Consider the set of outcomes of the procurement procedure

\[ A = \{(x, p) \mid x \in D, \ p \in [0, +\infty)\}. \]
where \( x \) is a formalized description of the supplied good and \( p \) is the price by which a contract is awarded (the specific innovation of the Russian legislation with the possibility of achievement of negative prices in the auction (the transition to the auction for the right to deliver the goods free of charge) is not implemented into the model.).

Below we’ll call contracts the elements of the set \( A \).

If the selection stage of an auction or tender gives the only bidder (hereafter terms supplier, producer, seller, and bidder are synonymous) with \( x \in \tilde{D} \), he must be awarded with a contract. Hence set \( \tilde{D} \) can be called the set of ‘quality goods’ or simply quality set. Denote by \( p_0 \) the initial (maximum) contract price which should be included into the procurement notice according to the Russian legislation. Let us introduce into consideration the set \( \tilde{A} = \tilde{D} \times [0, p_0] \), each point of which \((x, p)\) – basic principal’s feasible contract.

Suppose that on the set of contracts a preference order of the basic principal (BPPO) is defined. The same preference order according to Definition 1 has \( \textit{bona fide} \) agent. We put forward the following assumptions about its properties.

1. BPPO is reflexive: a customer is indifferent between every two identical contracts (a firm which supplied a bid first is the winner).

Since hypothesis H1 suggests that the bundle of good’s specifications contains all specifications essential to the buyer, it is natural to assume that, by comparing the two contracts that match the content, terms and cost of delivery, he considers them as indifferent.

2. BPPO is complete and transitive.

Given assumptions 1-2, we have:

- from any finite number of contracts the public buyer is able to choose the best,
- each feasible contract belongs to the definite set of indifferent contracts (indifference set of the contract),
- and indifference sets of contracts, which are not indifferent to each other, do not intersect.

For simplicity and using visual geometric interpretations, let us assume that the subject and conditions of purchase can be expressed by a single numerical characteristic \( q \) which stands for quality of the supplier’s bid, and vary in the set \([q_0, +\infty]\): we assume that basic principal considers that fall in the quality of goods below \( q_0 \) cannot be compensated by a decrease in its prices: 
\[
MRS_{wp}(q_0) = \lim_{\delta q \to 0^+} \frac{\delta p}{\delta q} = +\infty.
\]

In this case, each indifference set does not contain interior points because the contracts differ in price characteristic (\textit{ceteris paribus}) cannot be indifferent to each other. Hence, we can replace the term “indifference set” by the term “indifference curve.”

Thus, given these assumptions, the preferences of the basic principal on the set of contracts can be represented by his indifference map (indifference map is symbolized set of indifference curves of the subject on which the arrow indicates the direction in which lie strictly more preferred alternative for him).

Consider the problem of procurement of homogeneous goods. In this case contracts which differ only in the value of qualitative characteristic, varying over a range of \([q_0, +\infty]\), are considered to be indifferent to each other and indifference map looks like follow.

![Figure 2. Basic principal's indifference map: the case of homogeneous goods](image-url)
Consider bidding for the purchase of a differentiated product. Generally speaking, we can assume that the contract, which correspond to the large value introduced above qualitative characteristic, strictly more preferable for the buyer (ceteris paribus). Given assumption, since the more expensive contracts is strictly less preferred to the buyer (ceteris paribus), his indifference curves are graphs of strictly increasing functions.

3. **BPPO is complete and transitive.**

Indeed, it is natural to assume that:

- if the basic principal considers two contracts that are not indifferent, then enough small changes in price and/or quality in the first contract don’t change his preference relative to the second;
- if the value of qualitative characteristic is gradually increasing by uniform way (along the indifference curve), the corresponding price changes are non-increasing.

Thus, given assumptions, basic principal’s indifference curves are the graphs of strictly monotonically increasing, continuous, concave functions and his indifference map looks like follow.

![Figure 3. Basic principal's indifference map: the case of differentiated goods](image)

It should be noted that the smoothness and strong convexity BPPO, generally speaking, are not assumed. Indeed, the market consists of a finite number of different groups of differentiated goods, and quality is considered to be the same within each group, BPPO is modeled by family of piecewise constant non-decreasing indifference curves.

4. **PROCUREMENT BY ENGLISH AUCTION: THE IDENTIFICATION OF PRINCIPAL BONA FIDES**

4.1. **Base model: the case of symmetric suppliers.**

Let us assume that purchasing goods are included in the Auction list, what excludes the possibility of their acquisition by the open tender, and the order quantity is so large that the goods cannot be purchased by request for quotation.

Given assumptions the Principal prescribes the Agent to purchase goods by the English auction. Let us consistently take some hypotheses and determine the choice of the public buyer (agent) under the given regulatory rules.

H2. Public buyer defines the set of feasible product offerings as $\tilde{D}$.

Let us suppose that there are $N$ suppliers who can deliver the goods from this set:

$$x' \in \tilde{D}, \quad i = 1, 2, \ldots, N, \quad N \geq 1.$$

H3. Each supplier knows what his own production and delivery costs will be if he wins a contract and this information is available to him only.

Hereafter we will denote by $c_i$ the $i$-th supplier’s economic costs of production (purchase price when buying from a producer) and delivery costs of the procured items (there is no participation cost):

$$c_i = C_i(x'), \quad x' \in \tilde{D}, \quad i = 1, \ldots, N.$$

In this subsection, for the sake of simplicity, we agree to assume that the numbers of suppliers are ordered according to the size of their costs: $c_1 \leq c_2 \leq \ldots \leq c_N$.

H4. The suppliers are symmetric: all the bidders appear to be the same to the buyer and to each other. We assume that there is a famous probability distribution $F(\mu, \sigma)$ and suppliers independently draw their costs from it.
Constructed model is the independent private-values model [2, p. 705], traditionally used in the modeling of auction’s procurement.

H5. Public buyer sets the initial (maximum) contract price \( p_0 \) such a way that the following inequality is satisfied:

\[
\max_{i \in I} c_i \leq p_0, \quad I = \{1, 2, ..., N\}
\]

The last assumption implies that all contracts \( \left(x'_i, c_i\right), i \in I \), are available contracts to him:

\[
\mathcal{A} = \left\{(x, p) \mid x \in \mathcal{D}, p \in [0, p_0] \right\}
\]

H6. All suppliers are supposed to be rational and risk-neutral.
H7. There is no collusion among suppliers.
H8. There are no dumping suppliers (nobody bids lower his costs).

We will call the suppliers, for whom hypotheses H7 and H8 take place, bona fide suppliers.

Proposition 1 [2, p. 707]. If there is a contracting authority seeking to procure indivisible good by the English auction and hypotheses H1 – H8 take place, then the lowest-cost supplier will win the bidding, and the price of the contract will be equal to the costs of his last remaining rival.

Consider the problem of procurement of homogeneous goods. In this case \( N > 1 \), \( \sigma \) is sufficiently small, basic’s principal preference order can be represented by indifference map depicted at Fig. 2 and hypotheses H1-H7 are usually performed.

For simplicity reasons, assume \( c_1 < c_2 \).

Given assumptions (Proposition 1), by means of an English auction we will obtain the contract \( (x^1, c^2) \). This means in particular that

\[
\left(x^1, c^2\right) \succeq_i \left(x'_i, c'_i\right) \forall i \geq 1. \quad (1)
\]

It should be noted that the contracts in the right-hand side of (1) are affordable to the buyer as they can be obtained by means of an open tender or, if legislation will change, first-price auction (first-price auctions: Dutch auction and request for quotations).

Let us depict contract \( (x^1, c^2) \) and contracts \( (x'_i, c'_i) (i=1, 2, ..., N) \) in the coordinate system “Quality” – “Price of Contract (Costs)” and, to identify which one is most preferable to basic principal, use his indifference map, depicted in Fig. 2.

![Figure 4. Contracts optimal to the Basic Principal and to the Principal: the case of homogeneous goods](image)

It is clear that for the basic principal the contract \( (x^1, c^2) \) awarded by means of the English auction is dominated:

\[
\left(x^1, c^1\right) \succeq_{\text{BP}} \left(x^1, c^2\right) \quad (2)
\]

From (1)-(2) we have \( \succ_{\text{BP}} \neq \succ_{\text{BP}} \). Hence (Def. 1), principal can be considered as mala fide.


To describe the procurement of differentiated goods, let us modify the model constructed in the previous subsection by taking the following assumptions.
H9. The set of suppliers S is a union $M \leq N$ of disjoint sets (classes of suppliers): 
$$S = S_1 \cup S_2 \cup \ldots \cup S_M, \quad S_i \cap S_j = \emptyset \quad (i \neq j).$$
and all the bidders of each class appear to be the same to the buyer and to each other. Here $|X|$ stands for the number of elements of finite set $X$. It is clear that $\sum_{i=1}^{M} n_i = N$.

We assume that there are famous probability distributions $F_i(\mu, \sigma_i), i = 1, 2, \ldots, M$, and suppliers of each class independently draw their costs from the corresponding probability distribution.

If $M=1$, we have the independent private-values model. Below we’ll assume $M > 1$.

Let $I_k$ stands for set of the $k$-th class suppliers’ numbers: $I_k = \{i_1, i_2, \ldots, i_{n_k}\} \quad 1 \leq k \leq M$. It is clear that
$$I = I_1 \cup I_2 \cup \ldots \cup I_M, \quad I_i \cap I_j = \emptyset \quad (1 \leq i, j \leq M, i \neq j).$$

H10. For every integers $k, l \in [1, M]; \quad k < l$, the following inequalities are true:
$$c_i < c_j \quad \forall i \in I_k, j \in I_l.$$

The latter assumption is necessary for the modeling of procurement in the markets, where producers offer goods which are not indifferent to each other from the buyers’ point of view. Such products can be goods or services (cars, medical equipment, drugs, healthcare or educational services or something else) supplied by the sellers of different types (public and private organizations, international and domestic firms, and so on).

Since it is assumed that the higher quality goods imply the higher production costs, hypothesis H10 suggests the goods of higher quality supply the producers of classes with larger number.

H11. The auction is designed in such a way that each supplier has no information on the participation / non-participation in the auction other suppliers.

Proposition 2 [2, 714]. If there is a contracting authority seeking to procure an indivisible good by the English auction and the hypotheses H1 – H3, H5 – H11 are true, then the worst-quality supplier wins the bidding, and the price of contract will be equal to the costs of his last remaining rival or to the initial price of the contract.

Consider the problem of procurement of differentiated goods. In this case $N > 1$ (so as $M > 1$), $\sigma_i$ are sufficiently small, basic’s principal preference order can be represented by indifference map depicted in Fig. 3.

Below, for the sake of simplicity, we agree to assume that $|S_i| = 1, i \in I$, and, correspondingly, $M = N$. In this case, in particular, $c_1 < c_2$ (H10).

Given assumptions (Prop. 2), by means of the English auction we will obtain the contract $(x^1, c_2)$. This means in particular that
$$\left(x^1, c_2\right) \geq_P (x^i, c_i) \quad \forall i \geq 1. \tag{3}$$

Let us depict contract $(x^1, c_2)$ and contracts $(x^i, c_i) (i = 1, 2, \ldots, N)$ in the coordinate system "Quality" – "Price of Contract (Costs)" and, to identify which one is the most preferable to basic principal, use his indifference map.

**Figure 5.** Contracts optimal to the Basic Principal and to the Principal: the case of differentiated goods

It is clear that for the basic principal the contract $(x^1, c_2)$ awarded by means of the English auction is dominated:
$$\left(x^1, c_1\right) \geq_{BP} (x^1, c_2). \tag{4}$$
It is worth to note that for the basic principal the contract \((x', c_2)\) is dominated by the contract \((x^*, c_2)\) too. Moreover, for specific preferences, depicted in Figure 5, the contract \((x', c_2)\) obtained accordingly the regulation rules is the worst one in the basic principals’ Pareto set \(A_{BP} = \{ (x', c_i) \mid i \in I \}\).

From (3)-(4) we have \(\succsim_c \neq \succsim_{BP}\). Hence (Def. 1), principal can be considered as \textit{mala fide}.

5. BONA FIDE AGENT: THE IDENTIFICATION OF INCENTIVES TO QUASY-CORRUPTION

In this section we’ll consider a \textit{bona fide} agent, who procures under regulatory rules created by a \textit{mala fide} principal.

It is clear that given assumptions of previous section, the set of contracts, which are available to the buyer, has the form \(\{ (x^i, p) \mid p \geq c_i, \ i \in I \}\), and agent’s Pareto set \(- A_A = A_{BP} = \{ (x^i, c_i) \mid i \in I \}\).

Given the finiteness of the Pareto set and the completeness and transitivity of \textit{bona fide} agent’s preference order, the contract most preferred to him exists.

Let us suppose that it is the contract \((x^i, c_j)\) \((1 \leq j \leq N)\), corresponding to the bid of the supplier \(j\), and consistently consider a number of obstacles in the way of obtaining the contract.

5.1. The second-price risk.

Let us assume that \(N>1\) and \(j>1\). As noted above ((1) - (4)), given the existing regulation rules, the contract most preferred to the buyer cannot be obtained.

However, when we purchase homogeneous goods, the costs of suppliers are close to each other, and we can consider the second-price risk \((c_j - c_i)\) as sufficiently small value. In this case, we can substitute the hypothesis of basic principal’s rationality with the suitably constructed hypothesis of his bounded rationality, and ascertain the acceptability of the English auction for the purchase of homogeneous goods.

Moreover, the cost of open tender for procure homogeneous goods, which can permit contracting authority to obtain the most preferred contract \((x^i, c_j)\), could surpass the cost of the relevant auction on the amount greater than \((c_j - c_i)\).

When purchasing differentiated goods similar risk evaluation is not possible. Actually, in this case we cannot assume that \(N>1\) (Table 2), and we have to assess risk by the value of \((p_0 - c_j)\). This gives us grounds to say, rather, not about risk, but about the "curse" of the second price.

5.2. The risk of suppliers’ \textit{mala fides}.

When purchasing homogeneous goods the risk of suppliers’ \textit{mala fides} connected with their collusion (H7 is violated) is limited due to the limited size of the supplier-favorite’s surplus \((p_0 - c_{favor})\). Besides this, the \textit{bona fide} contracting authority is able to manage this risk through careful monitoring of prices and setting up corresponding initial contract price \(p_0\).

When there is only one dumping supplier, for example, with the number of \(k\) \((k>1)\) (H8 is violated), the auction gives to public buyer contract \((x^i, c_i)\), which jeopardizes its implementation: \(p = c_i < c_k\).

Nevertheless, the difference between the supplier’s costs \(c_i\) and the contract price \(c_k\), generally speaking, may be less than the difference between its economic and accounting costs, which enables the contracting authority at the relevant transaction costs to achieve proper performance of the contract.

If there are several suppliers, bidding below their costs, \textit{ex ante} estimation of the difference between the costs of the winning supplier and the contract price is not possible. In this case, the auction winner, generally speaking, is not able to satisfy the needs of the public buyer, even when homogeneous goods are purchased.

In turn, when differentiated goods are purchased, suppliers’ \textit{mala fides} increases the price of the contract by the amount up to \((p_0 - c_{winner})\) in the case of collusion or \((c_{winner} - p_{final})\) in the case of dumping, or jeopardizes buyer satisfaction.

5.3. The risk of transparency.

When differentiated goods are purchased, the violation of the informational opacity hypothesis H11 leads to that the \(j\)-th supplier leaves the market with other suppliers of high quality goods.

In the case of repeated purchasing, the auction triggers the formation of a specific market of lemons [23, p. 46], which is characterized by low quality of supplied goods, but is not characterized by the low cost of their purchase due to the extremely low competition in the procurement.

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6. CONCLUSION

Risks in the procurement of differentiated goods by means of the English auction, discussed in the previous section, prevent to the bona fide buyer to obtain the most preferred to him contract and create strong incentives to restrict competition in the procurement process wherewith manipulating in the description of the subject matter of the procurement, the term of the contract, abusing information, etc.

It seems that the scale of such quasi-corrupt behavior can be significantly reduced in RF by taking the following measures most of them are proposed in the Model Law.

1. To designate in the invitation to the auction the minimum number of suppliers required to register for the auction in order for the auction to be held (Model Law, art. 53-j).
2. To eliminate the contradictions in the Russian public procurement legislation that impede the implementation of scoring auctions and handicap auctions, which give the possibility of compensating the higher contract price by the higher quality of the purchased goods (Model Law, art. 53-g).
3. To prevent mala fide suppliers from the collusion, to introduce the Dutch auction into the list of acceptable procurement methods.
4. If the procuring entity uses an auction, it shall present a statement of the reasons and circumstances upon which it relied to justify the use of that method (Model Law, art. 28-3).

And finally, we can reduce the scope for quasi-corruption behavior by means of essential increase of the price thresholds.

Thus, in the paper we have

- considered the model of ‘quasi-corruption’ based on assumptions of mala fides of the Principal and bona fides of the Agent,
- proposed and used the algorithm of modeling corrupt/quasi-corrupt behavior,
- completed the construction of the typology of principal-agent models.

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1.0 Background
Nepal was unified in 1768 and was remained as the only world’s Hindu Monarchy until 2008. During this period, Nepal experienced an autocratic hereditary Rana Prime Ministership (for 104 years until 1951), a non-party Panchyat system from 1962 - 1990, a constitutional monarchy until 2008, and on May 28, 2008 the country was declared a Federal Democratic Republic abolishing the 240 year-old monarchy. The country has also experienced armed struggle from 1996 to 2006 and a comprehensive peace accord was signed on November 21, 2006. Because of this, for drafting new constitution, first election for constituent assembly was held in April 2008 and because this assembly could not draft new constitution, second election for constituent assembly was held in November 2013. Constitution drafting process has not yet been completed and the country is undergoing peace process since the year 2006 after a decade of armed struggle. Despite all these adversities, country is struggling for its economic development.

Nepal is one of the South Asian countries lying between India and China with a population of 26.5 million (2011 census). Administratively, the country is divided into 5 development regions and 75 districts. All together Nepal has 3915 Village Development Committees (VDCs) and 58 municipalities (including one metropolitan city). As per Nepal Living Standard Survey 2010/11, 25.16% population lives below poverty line and the per capita income is US $ 735 (2011/12).

Focus of the public finance management should be on the most advantageous distribution of the limited resources and yielding maximum output from the allocated budget. About 60% of the allocated budget of the Government of Nepal (GON) is spent in procurement activities\(^i\), Nepal government’s annual procurement has been estimated as $ 650 million\(^i\). Nepal’s annual budget (for FY 2013/14) is of about $ 5.17 billion (1 US$ ≈ 100 Rs), of which 46.7% is allocated as development expenditure and 53.3% as regular expenditure. Only 69.6% of the budget is expected to be met through its own revenue and 14% by foreign assistance with projected deficit of 17%. In general, the government has been able to make expenditure of less than 80% of the allocated budget. On the other hand, Nepalese economy is facing major challenges like low economic growth rate (less than 5%), high inflation rate, import based production system, limited labor market to absorb yearly about 400,000 new entrants, lack of physical infrastructure, low institutional capacity, and lack of good governance. In this background, this paper discusses the status of public procurement in Nepalese context against the following core pillars of public procurement:

- Value for money
- Open and effective competition;
- Ethics and fairness; and
- Accountability, transparency and reporting
- Equity

2.0 Brief History of Public Procurement in Nepal
Rules (Procedure) Regarding Public Fund Spending 2016 was implemented in 1958/59, which was the first law related to public procurement. This regulation assigned the procurement activities of the ministry to the concerned secretary. In order to address the issues related to public procurement such as transparency, competitiveness and accountability, financial administration related Act and Regulations were changing from time to time – The Financial Administration Rules 1985/86, Financial Administration Rules 1995/96 and Financial Administration Rules 1999 were the examples. In the continuous process of bringing public procurement reform in Nepal, as in majority countries of the region, Public Procurement Act 2063 (PPA) was enacted in 2007. Following are some of the major reasons for enactment of separate procurement law:

- To make procurement process more competitive – the existing Financial Administration Rules 1999 contained provisions limiting competitions in public procurement;
- To reduce the time consumed in procurement process – prevalence of two envelope system and bid may be cancelled without any valid reason;
iii. To make the procurement process result-oriented and based on adequate preparation — in case single bid, the bid could not be accepted, consultancy services could be procured through quality & cost based selection (QCBS) method only;

iv. To promote the competitiveness in public procurement — only Nepali bidder could bid for the bid of value up to Rs. 250 million, direct procurement from the public enterprises was allowed;

v. For proper allocation of risks — no provision for price adjustment for contract of duration less than 18 months;

vi. To select qualified bidder rather than to select the lowest bidder;

vii. To promote accountability, transparency, and justice in public procurement;

viii. To assure good and quality procurement.

The preamble of the PPA given below summarizes the need for enactment of PPA:

“Whereas, it is expedient to make legal provisions in order to make the procedures, processes and decisions relating to public procurement much more open, transparent, objective and reliable, obtain the maximum returns of public expenditures in an economical and rational manner by promoting competition, fairness, honesty, accountability and reliability in public procurement processes, and; ensure good governance by enhancing the managerial capacity of procurement of public entities in procuring, or causing to be procured, construction work and procuring goods, consultancy services and other services by such entities and by ensuring the equal opportunity for producers, sellers, suppliers, construction entrepreneurs or service providers to participate in public procurement processes without any discrimination…”

Some of the special features of the PPA are given below:

i. Independent and integrated procurement Act applicable to all public entities (PEs);

ii. Enacted by the parliament;

iii. Establishment of independent public procurement monitoring office under the Office of the Prime Minister and Council of Ministers;

iv. Definition of the public entity — categorized government public entities and other public entities;

v. The chief of the concerned PE is made responsible for preparing a procurement plan and carrying out the activities relating to procurement to be made;

vi. A PE shall establish a procurement unit or assign the procurement responsibilities;

vii. Establishment of independent Review Committee and provision relating to review of procurement proceedings/decision;

viii. Provision relating to conduct of the officials involved in public procurement as well as the bidders and proponents including blacklisting of bidder, proponent, consultant, service provider, supplier, construction entrepreneur or other person, firm, organization or company;

ix. The PE is required to form an evaluation committee for examination and evaluation of the pre-qualification proposals, bids, expression of interest or proposals of consultancy services or sealed quotation.

x. Public notice of procurement contract shall be given;

xi. Provision for termination of procurement contract and remedy therefor;

xii. Mechanism for dispute settlement;

xiii. Procurement transaction may be carried out through electronic communications means;

xiv. Legal documents — Act, Regulations and procurement manuals are to be kept in the website of the Public Procurement Monitoring Office (PPMO) for information and convenience of the public;

xv. Power to make rules - The government may make Rules required for implementation of the objective of the Act, and the public entities except the government entities may make necessary Rules subject to the Act, Rules or Formation Order relating to such entity.

3.0 Status of Public Procurement in Nepal

It is the concern of any government to achieve and enhance the effectiveness, efficiency, transparency and equity in public procurement because public procurement “affects all aspects of people’s lives and assumes a large share of government budget”[10]. The Government of Nepal (GON) is the largest procuring (Goods, works, and services) institution in the country. “Some 60 percent of the annual national budget goes to procurement. Hence public procurement plays a critical role in the economy and is an important factor in economic growth.”[11] “Public procurement reform is one of the major reform areas in improving financial governance in the country. Public procurement system is relatively new in Nepal and is undergoing various strengthening activities.” In this background, the paper discusses on following headings:
3.1 Issues related to implementation of Public Procurement Act and Regulations

Under this heading, discussions will be focused on following issues:

a. Procurement planning
b. Procurement proceedings
c. Procurement and corruption

da. Procurement planning

Public procurement is the process of acquiring any goods, consultancy or other services or construction works by a public entity in order to deliver or develop facilities or services in response to the “real need” therefore delivery or development of the “right quantity” is imperative and should be delivered or developed at the “right time”.

According to procurement law, a PE shall (a) prepare description of goods, construction works and services to be procured, (b) prepare cost estimate, (c) prepare procurement plan, (d) have (the head of the PE) the responsibility of carrying out all the activities relating to procurement by fulfilling the procedures referred to in the Act, (e) select the procurement method based on the conditions and cost estimate as prescribed, however, no procurement shall be made in piecemeal to limit competition, (f) procure by inviting open bid, and (g) prescribe the qualification of bidder or proponent. Despite the provisions that a PE shall establish a procurement unit or assign the responsibilities thereof in order to carry out the procurement related activities, many PEs have not yet created the Procurement Unit and in the PEs that have created the Procurement Unit are also lacking experienced, efficient and skilled staffs preventing effectiveness in public procurement. As mentioned in the Yearly Report, 2067 of PPMO, there are about 4000 spending units in the governmental sector only and the total number of the public entities including public schools, local bodies, public enterprises and others is estimated to be as more than 20,000. In the absence of the procurement units and lacking trained staffs in PEs, result oriented procurement cannot be envisaged. For standardization of the procurement process, common understanding of the public procurement law of the country among the procurement staffs is fundamental. Similarly, common understanding of the assumption of the procurement law of the country among the higher authority and the oversight agencies are critically important for strengthening morale of the staffs making procurement decision.

Procurement planning starts from government programs and budget. It is also based on the identification and formulation of the projects. Not only planning and preparation for procurement is important but identification and formulation of needs (project, goods or services) are even more important for developing countries like Nepal whose yearly budget is not met through its own revenue. In the fiscal year 2012/13, revenue is estimated to contribute 71.5 percent, foreign grants 11.6 percent, principle repayment 1.1 percent and foreign loan and domestic borrowing 15.8 percent to the government’s total expenditure. Every year, more than 10 percent of government’s total expenditure goes on the repayment of principle and interest against public debt alone. The ratio of foreign debt to the total outstanding debt stands at 58.6 percent. For effective implementation of the procurement law, adequate and timely availability of the budget is imperative because as per the Sub rule 6 of PPR, public entity should not initiate procurement proceedings unless a necessary fund for procurement is allocated, but a full budget was adopted only in the fourth quarter in Fiscal Year 2013. The “extension of budget discussions well into the fiscal year and the bunching of capital expenditure near its end are recurrent problems in Nepal; similar, if smaller, delays occurred in previous years as well. In FY14, the government has managed to reverse this trend by adopting a full budget on time and fast-tracking the review and approval process for key capital projects” by the National Planning Commission (NPC).

National Planning Commission approves the programs submitted by the concerned ministry and the Ministry of Finance releases budget. There are examples of affecting procurement activities due to lack of budget. A project declared by the government as National Pride Project—the shortest route connecting north and south of the country known as Kaligandaki Corridor (417 km) has also facing a budget crunch and therefore for six years not even the track opening has been completed. Another national daily, The Himalayan Times reports that implementation of projects “considered vital for the country’s development moved ahead at a snail’s pace last fiscal year, with more than half of them failing even to meet 80 percent of the target set for the year, thanks largely to budget crunch.” In general, budget allocation is not based on the real need and estimate giving ground to ad hoc type of program and budgeting. It is also reported by a newspaper that there was reallocation of the budget to the projects that are already completed. Furthermore, estimating the project cost, specification writing, fixing the project schedule and
preparation of bidding document including selection of the procurement method (packaging and slicing) are other important matters playing vital role in procurement planning.

There is also a tendency of keeping the project duration less than 15 months, without considering the nature and activities of the project to be executed because of the (a) provision of the PPA. As per the provision (Sub-section 55.1 of the PPA), in the contract having duration exceeding 15 months the competent authority may adjust price. Due to this provision, the public entities are found putting contract duration less than 15 months to avoid price adjustment. As a consequence, Extension of Time (EOT) and dispute become unavoidable, and (b) late release of the budget or late starting of procurement proceeding, the duration available for construction or delivery of goods/services remain very short to perform such contract before the end of the fiscal year making complicated the closure of the contract. This type of problem is arising out because of the wrong approach in procurement planning and wrong attitude of the staffs involved in procurement planning and procurement decision-making.

The above-discussions and examples show that effective and result oriented public procurement requires (a) real need based project identification and formulation, (b) requirement based budget allocation, (c) preparation and adherence to procurement plan, and (d) experienced and skilled human resource.

b. Procurement proceedings
A procurement proceeding is the means of implementing procurement planning and acquiring the competent party – contractor, supplier, consultant or service provider for concerned procurement. The Government of Nepal (GON) has put effort in bringing reform in public service delivery process including public procurement. In this process, the GON has promulgated “Public Procurement Act (PPA) and Regulation (PPR) in 2007 to make the procurement system transparent, fair, competitive and efficient. These two legislations aim to maximize returns of public expenditures in an effective and efficient manner by promoting competition, fairness, accountability and reliability in public procurement processes by ensuring the equal opportunity to the bidder to participate in public procurement process without any discrimination.” In this direction, PPMO attempted to standardize the public procurement process by issuing Standard Bidding Documents and Standard Form of Contract (for consulting services) to be effective from 28/1/2009.

i. Establishment of procurement unit
For effective public procurement, PPMO instructed all the public entities to establish procurement unit through a public notice of 30/12/2007 and requested the government ministries by issuing circular for establishment of procurement units. Similarly, PPMO also delegated its authority to the District Treasury Control Offices to monitor the establishment of procurement units in district level offices but the result was not encouraging. On the other hand, there was a coverage mentioning that Kathmandu Metropolitan City - the only Metropolitan City of the country has approved the tender for construction of controversial Kathmandu Tower bypassing the procurement unit. This issue was also investigated by the Commission for Investigation of Abuse of Authority (CIAA).

ii. Selection of procurement method and slicing/packaging of contract
According to PPA, in making public procurement, a PE should use any of the following methods considering the conditions and estimated cost as prescribed:

For procurement of goods, construction works and other services
- International level open tendering
- National level open tendering (Above Rs. 2 million for construction works and above Rs. 1 million for goods and other services)
- Sealed quotation (Up to Rs. 2 million for construction works and up to Rs. 1 million for goods and other services)
- Direct purchase (Up to Rs. 500,000 for construction works and up to Rs. 300,000 for goods and consulting services)
- Users committee or beneficiary groups (Up to Rs. 6 million), and
- Force account

For procurement of consultancy services
- Competitive proposal
- Through negotiations

The Act does not allow slicing the contract package to limit competition, but is not easy to investigate. However, national level daily newspaper is found reporting about slicing the contracts for taking undue benefits. Besides such reporting, no any systematic study, so far has been found that has been made in Nepal to know whether the slices have been made to limit the competition.
iii. Provision relating to tender

Single stage and two-stage bidding

As per PPA (Sub-section 28.1), an invitation to bid can be made by (a) inviting open bids by determining prequalification, and (b) inviting open bids without determining prequalification. Open bid may be invited in a single stage or in two stages. Single stage bidding is in use and two-stage bidding is made on following conditions:

- When it is not feasible to define fully the technical aspects of the goods or construction works or services to be procured or the terms and conditions of the procurement contract at the time of the invitation to bid, or
- Because of the complex nature of the goods or construction works or services to be procured, if it is necessary for the Public Entity to discuss with the bidders about how to resolve the problems related to various technical aspects or the procurement contract and about such technical aspects and conditions of contract and benefits accruing there from.

Determination of prequalification

Prequalification (PQ) is determined to procure large and complex construction work, or to procure goods of high value such as industrial plants as determined by the PPMO or with a view to identify qualified bidders. Public entity may also determine PQ, if it considers appropriate, for other procurement also. Though the Act has authorized PPMO to determine “large” and “complex” construction work and the “high value” goods, PPMO has not yet determined. The objective of determining PQ is to identify the potential bidders having required capability such as skill, experience, and resources and not to encourage the bidders not possessing required capability. But the provision under Sub-section 12.2 of PPA, which allows the PE, if it considers appropriate, to determine prequalification for other procurement as well, is likely to limit the competition if not used correctly.

Domestic preference

According to PPA Sub-section 14.8, in international level bidding, the PE may give domestic preference to the Nepalese entrepreneurs and businesspersons as prescribed, and where domestic preference is to be so given, that matter shall be set forth in the notice on invitation to bid and the bidding document. In the case of goods, such domestic preference has not been prescribed but there is a provision in the Rue 17 of PPR that the goods manufactured in Nepal are to be procured even if the cost of such goods are higher by up to ten percent than that of goods manufactured abroad. Since the domestic preference is not a compulsory matter and may be granted as per condition, the provision under the Rule 17 of PPR gives the impression of being contradictory to the spirit of the domestic preference.

In the case of construction work, domestic preference may be given pursuant to Sub-section 12.1 of Construction Business Act 2055 (1999), which states:

“Notwithstanding anything contained in the prevailing law, any public construction works mentioned in an international competitive bidding may be procured from the following construction entrepreneur in the following circumstances:

(a) despite that the total contract price quoted in the bidding by a construction entrepreneur wholly owned by a Nepalese citizen or by a construction entrepreneur licensed under joint venture with a foreign construction entrepreneur with at least fifty percent of share owned by the Nepalese citizen or by a construction entrepreneur making a joint venture agreement with a foreign construction entrepreneur with at least fifty percent of share owned by the Nepalese citizen is higher by a maximum of seven and half percent than the total contract price quoted in the bidding by a foreign construction entrepreneur, the entrepreneur making such bidding.

(b) despite that the total contract price quoted in the bidding by a construction entrepreneur licensed under joint venture with a foreign construction entrepreneur with at least twenty five percent of share owned by the Nepalese citizen or by a construction entrepreneur making a joint venture agreement with a foreign construction entrepreneur with at least twenty five percent of share owned by the Nepalese citizen is higher by a maximum of five percent than the total contract price quoted in the bidding by a foreign construction entrepreneur, the entrepreneur making such bidding.”

Francis Ssenoga has identified three issues in terms of how developing countries could be integrated into global procurement framework as (a) Sector-specific approach, which argues that the sectors that offer employment to a larger number of a country’s citizens should be protected from foreign competition, (b) Creating competitiveness on the supply side of the market, which urges to focus on how to improve the competitiveness for especially the manufacturing sector, because the competitiveness cannot be improved through locking out foreign competition but
through structural adjustments within the firms themselves, and (c) Phased approach, which argues for regional trading blocks first before eventually expanding into a multilateral framework and says that the phased approach would enable countries to compete with those at the same level of development, build the competitiveness and then become global.

The developing countries with liberal economic policy need to review critically the issue of domestic preference in order to be benefitted from the price, skill and technology available in the open market and to boost up the local entrepreneurs and industries to achieve socio-economic objective of reducing poverty and creating employment opportunity.

iv. Bid examination and evaluation
Examination and evaluation of the bids starts with submission of the bids, opened as prescribed in Section 22 of the PPA, to the Bid Evaluation Committee. According to the Section 22 of PPA, the PE should open bids as prescribed at the time and place specified in the bidding documents on the same day immediately after expiry of the deadline for the submission of bids. According to the PPR (Sub-rule 59.5), at the time of bid opening, decision regarding acceptance or rejection of bids should not be made. The evaluation committee examines and evaluates the bids following logical sequence shown in figure 1.

![Figure 1: Logical sequence of bid examination and evaluation](image)

**1st Stage: Examination of legal requirement**
Under this examination, following matters are examined:

i. Firm, organization or company registration certificate,
ii. Business registration certificate – a certificate obtained by a construction entrepreneur with object to operate the construction business. For carrying out public construction works, after registration of firm or company as private firm or partnership firm or company, construction entrepreneurs are required to obtain license pursuant to Construction Business Act 2055 (1999). Construction companies are classified as Class A, Class B, Class C, and Class D in Nepal pursuant to Construction Business Act. However, according to the provision of the PPA, “no provision can be so made as to allow only a particular class of construction entrepreneur, supplier, consultant or service provider to participate or to prevent any particular class of construction entrepreneur, supplier, consultant or service provider from participating in the procurement process,”

iii. Value Added Tax (VAT) and Permanent Account Number (PAN) registration certificate,
iv. Tax clearance certificate or document of tax returns for the period as specified,

v. Declaration made in writing by the bidder mentioning that (a) the bidder is not disqualified for taking part in the procurement proceedings, (b) the bidder has no conflict of interests in the proposed procurement proceedings, and (c) has not been punished for an offense relating to the concerned profession or business, and

vi. Any other documents as specified.

**2nd Stage: Examination of completeness of bids**
Only the bids qualified under examination of legal requirement are to be examined for their completeness. This examination is carried out to confirm:

i. Whether the documents establishing that the bidder is qualified under law to submit the bid are submitted or not,

ii. Whether the bid is complete in accordance with the instructions to bidders set forth in the bidding documents or not and whether it is signed by the bidder or by the bidder’s authorized agent or not,

iii. Where a bid security is required to be submitted along with the bid, whether a bid security of such type, period and amount as set forth in the bidding documents is accompanied with the bid or not,
iv. Whether the bid is substantially responsive to the technical specifications set forth in the bidding documents and the terms and conditions of procurement contract attached with the bidding documents or not.

v. Whether a power of attorney for the authorized agent or local agent of the bidder is submitted or not.

vi. Where a joint venture agreement is necessary, whether such agreement is submitted or not.

vii. Whether documents establishing the eligibility of the bidder and of goods mentioned by the bidder are submitted or not.

viii. Whether necessary document relating to the qualifications of the bidder is submitted or not.

ix. Where the bidding documents require the submission of a rate analysis, whether such rate analysis is submitted or not, and

g. Any other matters as prescribed.

According to Sub-section 23.4 of PPA, the Public Entity may ask bidders, in the course of examining the bids, for necessary information. According to Sub-section 23.5 of PPA, the concerned bidder should provide the information sought by the Public Entity but in providing such information, change or alteration in the bid price or other substance of the bid is not allowed. Furthermore, as per the provision related to Conduct of Bidder or Proponent, a Bidder or Proponent should not contact the PE from the time of bid/proposal opening until the notice of acceptance of bid/proposal which is likely to cause interference in the examination or evaluation of bid/proposal, and should not commit an act of interfering in the examination or evaluation of bid/proposal. Despite the provisions, bidders often form a cartel by which they try to manipulate the award decision in favor of one of their members, with or without the involvement of a corrupt inside official. Collusion agreements can include, for example, assigning "turns" among the cartel members for winning public bids, or agreeing to internal compensation payments for submitting high or other "failed" bids. This has become an institutionalized practice in Nepal leading to unscrupulous competition and rise of corruption. Such provisions show the complexity and criticality of contacting the Bidder/Proponent by the PE and furnishing information as requested by the concerned Bidder/Proponent. The leakage of information from PE during this period and interference and/or influence from the Bidder/Proponent is very difficult though not impossible to trace out and making public. This issue is one of the major issues in public procurement particularly in developing countries, where political systems are in transition such as Nepal. The media (print and digital) plays very important role in such environment and is the major source of information in this regard.

3rd Stage: Evaluation of technical aspects

The bids passing through examination of completeness are evaluated for meeting technical requirement. As provisioned in the PPR, the evaluation committee evaluates the following matters:

- Scope of supply of goods, construction works or other service,
- Technical specifications of key items of goods, construction works or other service and operating and performance characteristics, and
- Duration of warranty period.

4th Stage: Evaluation of commercial aspects

After evaluating technical aspects, commercial aspects of the bids are evaluated, in which the evaluation committee will evaluate the following matters (Sub-rule 63.1 of PPR):

- Period for the supply or completion of goods, construction works or other service,
- Payment terms,
- Liquidated damages payable for the failure to complete the work the bidder in time and bonus receivable for the early completion of the work,
- Guarantee obligations of the bidder,
- Obligations to be performed by the bidder,
- Any other terms, if any, inserted by the bidder in the proposed procurement contract.

5th Stage: Evaluation of financial aspects

After evaluation of technical and commercial aspects of the bids, following matters under financial aspects are evaluated. If the preference for domestic goods and local construction entrepreneurs are to be given that should be adjusted at this stage of bid evaluation.
6th Stage: Special evaluation of bids for construction works

Besides the examination and evaluation mentioned above, the bids submitted for construction works are evaluated for following matters (Sub-rule 65.1 of PPR):

- Whether the work plan of construction works, performance schedule and timing of mobilization are in consistent with those set forth in the bid documents or not,
- Whether the per unit rate quoted by the bidder for the items listed in the bill of quantities is reliable or not,
- Whether the tender price is unbalanced for the following reason:
  i. The bidder has quoted unusually high rate for items of work to be performed at an early stage of the procurement contract, or
  ii. The bidder has quoted unusually high rate for any such items of the bill of quantities that it believes were underestimated in the bill of quantities.

The evaluation committee is required to assess the bids for frontloading and unbalanced bidding as well as for whether the bidder (a) has quoted such low prices that make the bidder fail in completing the work satisfactorily or (b) has quoted unrealistically low prices with or without misunderstanding of the scope or technical specifications of the construction works. In such condition, the evaluation committee is required to seek explanation including rate analysis from such bidder and the committee has been empowered so as to (a) if the explanation furnished by the bidder is satisfactory, the committee may recommend to accept the bid by taking additional performance security equal to the sum to be set by eight percent of the bid price from such bidder, and (b) if the explanation furnished by the bidder is not satisfactory, the committee may recommend the public entity to reject the bid. However, despite of this provision and low bidding, the members of the evaluation committee have not been able in recommending the bid for rejection. A case of Banke district of Nepal may be taken as representative example, where in a contract of earthwork, the awarded bid was more than 60 % below than the estimated cost (of Rs. 2,006,000); in a contract of road maintenance the awarded bid was more than 45 % below than the estimated cost (of Rs. 3,000,000); and in a contract of health post building construction the awarded contract was more than 25 % below than the estimated cost (of Rs. 1,947,000) and none of these projects have seen completion. Low bids, no doubt saves money at the outset but if the bids are unrealistically or excessively low then the consequence of such low bids will be either substandard work, or the projects in trouble. Low bidding has formed vicious circle especially in the bids for construction works. According to Ang Dorji (A. D.) Lama, Deputy Secretary-General of Federation of Contractors Association of Nepal (FCAN), the percentage of low bid in building and bridge is 10-25, roads and irrigation is 15-45 % and in earth work related works the percentage of low bid reaches up to 80 percent and followings are the reasons of low bidding:

- For making firms eligible in meeting qualification criteria to bid in future projects, construction entrepreneurs desire to win the contract even by low bidding,
- To grab and utilize the mobilization advance to execute the outstanding works of previous contract that was remaining due because of cash flow problem due to low bid,
- Because of acceptance of low quality work,
- Practice of bidding based on the past bidding trends without analyzing the rates,
- Lack of works in the market,
- To utilize the idle equipment,
- Non professionals attraction towards construction business perceiving that easy money can be earned in this business,
- To be saved from money laundering by showing profits in construction business
- The trend of holding contracts above the bid capacity
- Due to incapability of the bid evaluation committee to reject the low bid,

7th Stage: Determination of lowest evaluated bid

At this stage, the bids are evaluated to determine lowest evaluated bidder. However, as discussed above, the practice has been dominated by determining “the lowest bid” rather than determining the “lowest evaluated bid”. For example, in a case reviewed by PPMO it was found that the bid evaluation committee had clearly mentioned that because of the low bid, the bidder could not execute the work. In such event, as mentioned above, the evaluation committee was required to ask the bidder for necessary clarification including the rate analysis. Then, if the committee found the clarification satisfactory it could recommend the bid for acceptance with demanding additional 8 percent performance security; or if the committee found the clarification unsatisfactory, it might recommend the bid for rejection but the bid was awarded without asking for clarification, by demanding 8 percent additional performance security.
8th Stage: Post-qualification examination
At this stage, the lowest evaluated bid is examined for assuring that it meets all the qualifications mentioned in the bid documents.

9th Stage: Preparation and submission of Bid Evaluation Report
This is the final stage of bid evaluation and the final task assigned to the Bid Evaluation Committee that the committee is required to prepare detailed Bid Evaluation Report (BER) and submit it to the concerned public entity.

C. Procurement and corruption
According to the Corruption Perception Index 2013, Nepal is ranked 116 out of 177 with total score of 31 and it was ranked 139 out of 176 with total score of 27 in 2012. The country scoring below 50 on a scale from zero is considered as highly corrupt means that Nepal is also among the highly corrupt country. “Public procurement has been identified as the government activity most vulnerable to corruption. As a major interface between the public and the private sectors, public procurement provides multiple opportunities for both public and private actors to divert public funds for private gain.”

Therefore, it is said that a “clear and comprehensive regulatory framework for the conduct of public procurement is a fundamental prerequisite for curbing corruption in public contracting. It is the basis for the development and application of equal practice, for transparency and fairness, and for meaningful review and control mechanisms.” To ensure good governance and to make the public procurement procedures, processes and decisions more open, transparent, objective and reliable as well as to obtain maximum returns of public expenditures in an economical and rational manner by promoting competition, fairness, honesty, accountability and reliability, Nepal Government has enacted the Public Procurement Act in 2007.

Chapter 8 of PPA is dedicated to Provisions Related to Conduct of the officials, bidder or proponent involved in public procurement proceedings and black listing. According to Section 61 of PPA, the officials involved in procurement proceedings should adhere to following conduct:

a. Discharging one’s duty impartially so that bidders fairly compete in the procurement proceedings,
b. Operating procurement proceedings in public interest,
c. Not committing an act conflicting interest with the procurement from his/her work or conduct or behavior,
d. Keeping confidential all proprietary information of the bidder known by him/her in the course of the procurement proceedings,
e. Not working with a person, firm, organization, company and any other institution of private nature with which s/he had had dealings of procurement at the time of holding post for two years after retirement,
f. If s/he knows that his/her nearest relatives have participated as a bidder or proponent in the procurement proceedings of his/her involvement, not taking part in such procurement proceedings by giving immediate notification to one level higher authority,
g. Not committing an act in contravention of prevailing law, while carrying out procurement proceedings,
h. Not committing corrupt or fraudulent practice nor involving in such act,
i. Not colluding or involving in a group prior to or after submitting bid or proposal with the objective of forbidding or causing to be forbidden the benefit of competition.

The Act has also provided explanation on the nearest relative as husband, wife, father, mother, son, daughter of a joint family, mother-in-law, father-in-law, elder brother, younger brother, elder sister, younger sister, son-in-law, sister-in-law or brother-in-law. Similarly, the explanation of the terms - corrupt, fraudulent, collusive, and obstructive practices are included in the Standard Bidding Documents issued by PPMO. The terms are explained as given below:

a. **Corrupt practice** means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party;
b. **Fraudulent practice** means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;
c. **Coercive practice** means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
d. **Collusive practice** means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party.
e. **Obstructive practice** means:
• deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Government of Nepal/Development Partner (GON/DP) investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or
• acts intended to materially impede the exercise of the GoN’s/DP’s inspection and audit rights as mentioned in the bid documents.

According to Section 62 of PPA, a bidder or proponent should not carry out or cause to be carried out the following act with the intention of making interference in the procurement process or the implementation of procurement contract:

a. Giving or offering directly or indirectly improper inducement,
b. Submitting a fact by distortion or misrepresentation,
c. Engaging in corrupt or fraudulent practice or involving in such act,
d. Intervening in the participation of other competing bidder or proponent to be involved in any way in the proceedings relating to bid or proposal,
e. Making collusion or involving in groupism prior to or after submission of bid or proposal with the objective of allocating procurement contract among the bidders or proponents or fixing the price of bid or proposal artificially or noncompetitively or otherwise forbidding the Public Entity of the benefit of open and free competition,
f. Contacting the Public Entity from the time of the opening of bid or proposal until the notice of acceptance of bid or proposal is given with the objective of causing interference upon bid or proposal or committing an act of interference in the examination or evaluation of bid or in the evaluation of proposal.

Furthermore, the bidder responsible for preparing bidding documents or specifications of a procurement contract or for supervising the implementation procurement contract or a person or firm or organization or company affiliated with him/her, or an employee working in such firm or organization or company cannot participate in the bidding proceedings of such procurement. However, this provision is not applicable in the case of a turnkey procurement contract or procurement contract so concluded as to carryout both the design and construction work. The Act has also empowered PPMO by giving authority to blacklist a bidder, proponent, consultant, service provider, supplier, construction entrepreneur or other person, firm, organization or company from one year to three years based on seriousness of the act committed and to exclude from the blacklist as per the criteria prepared.

However, even after implementation of the regulatory framework, “there has been an indication that risks in public procurement, including intimidation, collusion and forming cartels amongst the bidders in Nepal are on the rise at the central and district levels. Cases have not only been reported in the media but also seen when the bidders are blocked from bidding because of intimidation and the use of physical force by individuals and groups.” Even there was news on the title that “Signing Amount in Development Projects”, mentioning that most of the government officials are setting tradition of taking signing amount before approving contracts related to development projects. Similarly, in order to avoid the competitive bidding for purchasing four airplanes, Ministry of Tourism and Civil Aviation initiated process of forwarding the proposal to the Council of Ministers for decision. Annapurna Post writes that in a contract of Electronic National Identity Card, the Home Minister had put pressure and because of his influence, the deadline for submission of bids was postponed for two times. Such news and reporting are common in Nepalese newspapers, which indicate that (a) level of corruption, (b) non-implementation of the provisions of the law, and (c) bypassing the provisions by adopting alternative means are in rising in Nepal. This is happening because of (a) politics in transition, (b) political parties/politicians opaqueness associated with high expenditure, (c) weak public administration standing on the personnel with low morale and the personnel affiliated to political parties, and (d) low accountability and high expenditure weakening the vision and integrity of the politicians. This has formed a chain of vicious circle contributing towards institutionalization of corruption as shown in Fig. 2. For example, the first constituent assembly (election was held in April 2008) could not draft the constitution and again, second election for constituent assembly was held in November 2013 and still there is a crisis of National Leader.
Figure 2: Vicious circle of institutionalization of corruption

Top bureaucrats of the country, while talking to journalists at the Office of the Prime minister and Council of Ministers openly criticized and revealed the political leaders behavior mentioning that the “nexus between politicians and businessmen and politicians and corrupt officials is the main reason why government has failed to break the syndicate system in public service sectors, including transportation and infrastructure development. Both parties are serving each other’s interest and shrinking their public duty, hence low quality services have been thrust upon people.” Furthermore, the Chief of the Commission of Investigation of Abuse of Authority (CIAA) has also revealed that the level of corruption is higher at local level because of the absence of elected representatives in local bodies. He also mentioned that 90 percent of the development budget is distributed among the parties and the officials, and only 10 percent goes to the people.

In the absence of effective implementation of the provisions under the law, only the regulatory framework will not be able in curbing the corruption in public procurement. In this ground, the attitude and morale of the individual (both public and private) involved in public procurement proceedings play very important role. Therefore, to run the robust system and implement the regulatory framework aiming at value for money and corruption free procurement, a behaviourally healthy public procurement personnel having high moral integrity and positive attitude, is the first and foremost requirement. Therefore, the challenge here is to prevent the undue intervention and influence of the corrupt political parties/politicians in making procurement decisions and developing the competent public procurement personnel possessing high moral integrity and positive attitude. A study-based movement and global public procurement network (GPPN), to curb the corruption in public procurement mainly for developing countries like Nepal, is highly regarded and recommended.

3.2. Role and challenges of Public Procurement Monitoring Office

As per the provision of PPA (Section 64), Public Procurement Monitoring Office (PMO) was established under the Office of the Prime minister and Council of Ministers (OPMCM) heading by the Gazetted Special Class Official of the Government of Nepal. PPMO came into operation on the 20 August 2007. The functions, duties and powers of the PPMO as provisioned in the PPA are as follows:

a. Make necessary recommendations to the GON for reform in the procurement policy/laws,
b. Issue technical guidelines and manuals,
c. Prepare standard bidding documents, prequalification documents, procurement contract document and documents relating to proposal to conduct procurement proceedings,
d. Collect statistics of procurement proceedings, monitor and conduct technical auditing in order to know the status of compliance with the Act, Regulations and manuals,
e. Provide opinion and advices to the PE, if they seeks opinion and advices on the matter as referred to in the PPA/PPR,
f. Establish and operate procurement website,
g. Publish a bulletin for information dissemination,
h. Prepare procedures required for coordination in the procurement proceedings and submit to the GON for necessary approval,
i. Make arrangements for regular training program for bidders and employees,
j. Make necessary criteria of exclusion from the blacklist and exclude from such blacklist as per the criteria,
k. Review, appraise construction works, supply, consultancy service, and other services system for making the procurement system effective,
l. Solicit regularly suggestion from customers or international organization and other foreign bodies as required,
m. Prepare plan of domestic or foreign assistance required to systematize and reform procurement system and to act as the central body for coordinating such assistance,
n. Submit the annual report of the procurement proceedings to the Government of Nepal.

Besides these, functions, duties and powers of PPMO are also laid down in the PPR Rule 144 and are as follows:

a. To monitor public procurement activities by making an observation visit of procurement proceedings of the concerned public entity or seeking reports and information relating to procurement activities from the public entity,
b. To give directive to the public entity in relation to the information and data to be included in the reports relating to procurement activities and the period for the submission of such reports,
c. To launch such programs as may be facilitative to the public entity to conduct procurement proceedings and the bidder, proponent, sealed quotation bidder and supplier to take part in procurement proceedings,
d. To make procurement proceedings simple and easy,
e. To establish a central data bank and maintain records of procurement contract implementation performance,
f. To develop methods for the dissemination of information relating to public procurement,
g. To do studies and research works on policies, laws, experiences and practices adopted by other countries in relation to procurement proceedings for bringing about improvements in public procurement system,
h. To develop plans for provision in the public entity of employees with capacity or competency and professional efficiency in the field of procurement,
i. To ascertain whether the persons to be appointed to the procurement unit, evaluation committee of the public entity and the Public Procurement Monitoring Office as per the plans referred to in Clause (h) fulfill the required expertise and professional efficiency,
j. To prepare descriptions of functions, duties and powers and responsibilities of the chief of public entity, employees of the procurement unit of such entity and members of tender evaluation committee,
k. To render assistance in the launching of training programs required to enhance professional efficiency of the employees involved in procurement activities of the public entity, and
l. To launch such training programs as may be required to enhance professional efficiency of employees.

To assign such wide and important functions, an efficient organization backed up with competent and motivated staffs is essential because organization should be “a consciously coordinated social unit, composed of two or more people, that functions on a relatively continuous basis to achieve a common goal or set of goals.” The points to be mentioned here is that the PPA was promulgated to bring reform in the existing public procurement practices as indicated by various development partners (DP) as well as to address the internal felt need. The provisions in such law or documents provide the documentary evidence, of the government commitment, towards the reform process, but usually give less priority to institutional aspect, which is only the means of achieving the overall objective of the reform processes and making the reform result oriented and sustainable. It is observed that planning for organizational or institutional setup is, in general one of the neglected aspects of the government.

PPMO started its operation from very limited space given to it in the Office of the Prime Minister and Council of Ministers and only after 20 months, a permanent office space is allocated. At the initial phase of its establishment, PPMO had two Divisions – Procurement & Monitoring and Policy & Administration under which there were five sections – Procurement, Monitoring, Training, Administration, and Policy & Legal. The positions available were only 24 among which only eight were officer level staffs. PPMO itself is a new entity struggling with various challenges – system development, organization and management issues including budget and staffing, their capacity development. Present status of positions in PPMO is shown in table 1 and the organization structure is included as Appendix-1 of this paper.

Table 1:

<table>
<thead>
<tr>
<th>Positions</th>
<th>FY 2009/10</th>
<th>FY 2010/11</th>
<th>FY 2011/12</th>
<th>FY 2012/13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>24</td>
<td>51</td>
<td>51</td>
<td>51</td>
</tr>
<tr>
<td>Fulfilled</td>
<td>15</td>
<td>28</td>
<td>24</td>
<td>48</td>
</tr>
<tr>
<td>Vacant</td>
<td>9</td>
<td>23</td>
<td>27</td>
<td>3</td>
</tr>
</tbody>
</table>

(Source: PPMO, Yearly Report 2070 (2014))

As the major factors, hindering effective functioning of any government organizations and projects in Nepal are (a) continuous transfer of the staffs in a very short period, and (b) lack of necessary and proper human resource in the office. The above table shows that PPMO has not been able to attract and retain the staffs. In six-year period of its
The average duration of serving the PPMO is one year, ranging from three months to 22 months. A high rate of turnover in government organizations means any one or combination of the following:

a. High political intervention,
b. Less “attractive” place/position to the staffs,
c. Loss of expenditure made upon such officials/staffs in foreign training/observation tour making that place/position further less attractive to newly transferred officials/staffs,
d. Continuously contribute on team degeneration and discourage team building in that organization.

In spite of the above-mentioned limitations and constrained, some of the major activities performed by PPMO (up to August 2013) are as given below:

- Amendment of PPA and PPR – Public Procurement Regulations 2064 (PPR) has already been amended for three times – first on 2008/11/24, second on 2008/12/17, and the third on 2011/6/20. Draft for amendment on the Act has also been prepared and submitted.
- Procurement monitoring – in the past three years, PPMO has monitored 65 PEs procurement proceedings covering 25 districts (among 75 districts of the country).
- Advices – all together 312 advices have been provided in the matter of public procurement to different PEs as per their request,
- Blacklisting – 65 suppliers, construction entrepreneurs, and services providers were blacklisted for 1 - 3 years after investigation,
- Training/Interaction/Seminars – PPMO has been conducting basic level training on public procurement and e-GP for capacity enhancement and developing human resources in public procurement. To enhance the level of awareness about public procurement among the public entity employees, suppliers, construction entrepreneurs and other concerned, in the past three years period, PPMO organized seminars in four districts and interaction programs in 18 districts,
- Standard Bidding Documents – PPMO has prepared and issued various 15 Standard Bidding Documents and has posted them in its website www.ppmo.gov.np,
- Initiation of e-GP – to ensure good governance by discouraging collusion and to make the public procurement proceedings more transparent, accountable, and competitive, from September 14, 2011 PPMO has availed e-bidding facilities through its website www.gepson.gov.np, which can be used by PEs. It is now working on developing and bringing into operation a single portal based electronic procurement system,
- Research and publication – PPMO has completed Baseline Indicator (BLI) study and has started publication of public procurement journal. Besides, it has started publishing bulletins and its own yearly reports.

3.3 Some lessons to learn
This section provides three different cases related to public procurement, for the purpose of lesson learning, that received wide coverage in Nepalese national newspapers.

Case 1: APC procurement
The Commission for Investigation of Abuse of Authority (CIAA) filed in Special Court on June 7, 2011 against 34 police officers (including three former IGPs), the Director, the local representative of Assured Risk Ltd (ARL), and the ARL in a case of Armored Personnel Carrier (APC) procurement, which is the largest corruption scandal in the history of Nepal Police. According to the Special Court decision, in a procurement of Rs. 420 million, there was a corruption of Rs. 288.16 million. Further details of the case are given below:

- The local agent (LA) was found planning for fraud from the very beginning of the submission of quotations because the quotation was found modified from time to time in favor of the contractor.
- There were only three quotations submitted for purchase of APC, in which one from the LA, and two other from his wife and sister in law.
- The LA had influenced the then IGP and the IGP influenced the Assured Risk Ltd to award the contract on its behalf to the LA’s company - Bhagwati Traders.
- According to the sealed quotation submitted by the Contractor on September 9, 2007 at the Police Headquarter, the origin of the APC was “computer typed” as India, China, the USA, Canada, Russia, etc.
and the UK. On which the LA “wrote by hand” a note mentioning, “the model of APC shall be OT64 and shall be repaired” means that should be the second hand.

- In the original bid and agreement, the model OT64 and the name of country Czechoslovakia was not mentioned. Therefore, the court said, that this is the starting point of collusion and fraud.
- There were following seven allegations against the LA:
  - The bid for APC was presented illegally.
  - Receiving USD 145,600 for transportation of eight APCs, and USD 73,534 for insurance, USD 62,580 for transportation and insurance of spare parts, and USD 51,467 for transportation and insurance of three water tankers and three ambulances from Police Headquarter.
  - Instead of paying premium for the coverage of USD 3,327,295 for insurance of APCs, the premium paid was only for USD 3,033,911.
  - Receiving payment of USD 2,080 as Value Added Tax of spare parts.
  - However, the contract was for transportation of the materials free of cost up to the Sudan port, afterwards received USD 51,467 under separate agreement for transportation.
  - Receiving payment without issuing the bill of tax payment.
  - Receiving Rs. 31,037,330 by influencing the then IGP, by transporting old and low quality APC and non-usable spare parts.

According the decision of the Special Court, three former IGPs, The England based contractor, and the local agent were found guilty in this case and were awarded two years jail term and recovery of the sum. Among the alleged police officers, 31 were given clean cheat by the court. In the same case, an Advocate has also filed a claim against three former Home Ministers and Secretary and a former Secretary for reinitiating investigation.

Case 2: Transformer procurement

The quality of the transformers purchased after FY 2006/07 by Nepal Electricity Authority (NEA) was challenged. In the transformers purchased (about 8000) by NEA in the past five years, problems were seen. In 2012, NEA had also formed an investigation committee. It was said that 4657 transformers installed at different places were examined. After detecting, that aluminium wire was used instead of the copper wire, the case of corruption and irregularities became public. NEA has purchased transformers in various dates from the China and Thailand based companies. Based on the complaints filed by the staff unions of NEA, the CIAA had begun investigation. The NEA suffered further losses due to sub-standard transformers - low resistance and high electricity leakage. As per the requirement necessary test (examination) was not done while accepting the transformers.

On August 25, 2013, the Commission of Investigation of Abuse of Authority (CIAA) filed charge sheets against the top officers including Managing Director of Nepal Electricity Authority (NEA) at the Special Court for their involvement on corruption and irregularities demanding up to 12 - year jail sentence in a case related to procurement of transformer of value Rs. 411 million. The CIAA had arrested 11 officers and 3 suppliers on August 4, and 10 other officers on August 20, 2013. Among the arrested were two foreign nationals. According to CIAA source, in purchase of about 2000 transformers the misuse of fund was more than Rs. 300 million.

It has also been reported that the officials were also charged for accumulating Rs. 93 million in the World Bank financed project while purchasing 56 transformers of 100 KVA capacities.

Case 3: Trishuli 3A

A contract agreement was signed between Nepal Electricity Authority (NEA) and China Gezhouba Group Company on May 28, 2010 for 60 MW hydroelectricity project – Upper Trishuli 3A on USD 89 million. The construction was to be completed and handed over within 35 months (i.e. May 1, 2014) after start of construction work (i.e. June 1, 2011). After submission of tenders, almost one year had taken for signing the contract and the reason stated for this delay was that the loan agreement between the governments of China and Nepal and thereafter another loan agreement to be made between the Ministry of Finance and NEA. Another one year again spent after signing the contract to start construction. As per the provisions in the contract, the power generation should start along with the handover of the project and therefore, if the contractor failed to hand over the project on time, the NEA should be paid compensation by the contractor.

Along with the bid, the contractor has submitted separate alternative proposal mentioning that the project (Upper Trishuli 3A) can be upgraded to generate 90 or 120 MW electricity during monsoon and for such up gradation will only require 40 % additional cost in the cost of original contract amount for making 120 MW and 25 % additional cost for making 90 MW. The NEA has rejected the alternative proposal on the ground that the project is suitable for generating only 60 MW of electricity. The Spotlight writes that the 2009 August annual report of NEA has mentioned that the 2007 DPR of Upper Trishuli 3A envisaged it as a 60 MW, 460 GWh project at an estimated
US$ 125 million cost with a US$ 120 million concessional loan from China. Among the four bidders, only the China Gezhouba Company has offered the alternative proposal. The bid was floated under EPC model and agreement was signed in which the time and cost of the project are fixed.

The contractor was proposing from time to time to augment the capacity of the project mentioning that Exim Bank of China is also ready to finance. Kantipur writes in its editorial that the contractor and its local agent were approaching to then Energy Minister with “inducement”. On Jan 3, 2013, after 19 months of start of construction government decided to upgrade the capacity of the project to 90 MW with additional USD 43 million, which is about 50% additional cost whereas the contractor has initially proposed that the additional cost would only be 25%. The staff unions of NEA then protested against the decisions of the government and warned not to implement the decision. An Advocate filed a petition in the Supreme Court against the government decision to augment the project mentioning that the decision of the government is against the Public Procurement Act 2063. The Supreme Court on February 3, 2013 barred the government from upgrading the capacity of the project to 90 MW. “It is the duty of NEA to complete the project on the basis of the existing contract, so there was no ground for escaping from the construction by citing anything,” the court order says. Following this decision, local political leaders and stakeholders obstructed works for more than two weeks in July 2013 putting various demand. They have submitted a 26-point demand including upgrading the project’s capacity to 145 MW, 20% share ownership to the locals, free-of-cost electricity to the VDCs affected by the project, and assurance of education, health and employment opportunity to the locals. The parties also stopped (on July 3, 2013) the workers of China Gezhouba Group Co. to work and locked out the project site, which was reopened with the help of District Administration Office. About 500 persons work in the project including 200 Chinese people.

The project now is running behind the schedule and after the Supreme Court’s decision, the NEA has directed to ensure completion of the project as per the original schedule of May 2014.

3.4 Conclusion
Public procurement is very important discipline and is very prone to corruption making practicing this (gradually becoming) profession requiring individuals possessing high integrity and decision-making capability. The environment within the country is not supportive towards professional approach and consequently corruption and fraudulent practices are experienced in many major procurement decisions along with non-compliance behaviour. On the other, the country has become not only “donor-driven” but also “donor reliant”. Therefore, for overall development of the country the development partner’s support and ethical use of donor's support have become imperative. It is felt that a procurement decision-making framework (PDF) is to be developed for the countries that are not matured in making development and procurement related decisions so that value for money can be achieved. The PDF required to be incorporated in the development partner’s agreement tying up with the global public procurement network, which will monitor and disseminate the information for ensuring and enhancing transparent and accountable behaviour of the top-level politicians and bureaucrats.
Appendix-1

Organization Structure of Public Procurement Monitoring Office, Nepal

(Source: www.ppmo.gov.np)
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EXAMINATION OF THE EFFECTS OF PERSONAL AND PURCHASING UNIT CHARACTERISTICS ON TYPES OF PROBLEMS EXPERIENCED AND TYPES OF CONTRACTS THAT ARE PROBLEMATIC

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ABSTRACT

This paper provides a contribution to the knowledge of contract administration by examining the role of personal and organization characteristics in project success. The research described in this paper examines the effects that personal and organizational characteristics of procurement professionals have on project success, specifically on the frequency and severity of problems experienced for different types of contracts. The analysis is based on the data collected from a survey of National Institute of Government Purchasing (NIGP) members, conducted by Davison and Sebastian in 2011. The survey included questions on the frequency and severity of contract problems over a variety of contracts and questions related to the characteristics of the respondents and their organization. A set of personal and organizational characteristics (ex. organization type, current position, the length of service in procurement, the length of service in current position, highest level of education, certificates that respondent possesses, the approximate annual volume of purchases made by the respondent and his/her entire agency etc.) were analyzed with contingency tables methodology to examine any relationship to the frequency and severity of contract problems over a variety of contract types.

We assume that certain personal characteristics may influence the frequency of occurrence and the severity of contract administration problems for particular types of contracts. The research results may provide procurement professionals and organizations information on the characteristics that contribute most to project success.

BACKGROUND

In recent years there have been numerous papers written on the transformation, in function and perception, of the role of public procurement. McCue and Pitzer discuss how the role of public procurement is rapidly changing from a clerical function to a strategic partner [1]. Gragan identified several steps needed to transform the public procurement to a service that supports other agencies [2]. In 2006, the United Kingdom and Canada conducted an in-depth knowledge transfer between the two governments in issues of procurement transformation. For both countries, one of the critical success criteria is the ability to focus on and measure fundamental improvement rather than just short-term price savings [3]. Prier, McCue, Steinfeld discuss how a field or occupation is viewed as a profession. One of the key indicators in determination of a profession is “the subject matter is sufficiently esoteric
that the common person does not generally understand it and must rely upon the expertise of another for proper completion of the task”. The authors analyzed numerous job descriptions in the following areas: nature of work, duties and job descriptions, education and training, work related experience, required certification and knowledge, skills and abilities. They conclude that there is a unique nature to the public procurement role [4].

Previous papers have discussed the implication that education and certification may be key indicators of a procurement professional’s success and competency. Members of the National Institute of Government Purchasing (NIGP) value education, over 56% have a 4-year degrees, and certification, over 55% have a certification [5].

This paper will examine if there is a correlation between any personal characteristics of a procurement professional to a project success.

PREVIOUS RESEARCH

This paper is based on the data of the survey of National Institute of Government Purchasing (NIGP) members conducted by Davison & Sebastian in 2011 [6]. The framework of the 2011 survey was based on findings from some other papers on contract administration problems such as the research on the establishment of contract goals [7]. Davison & Wright also proposed a conceptual model that related the “5 R’s” procurement project success criteria (delivering a product or service in right items, in the right quantity, for the right price, at the right time, with the right quality)[8] to the six types of contractual risks that each purchase of goods of services inevitably faces [9] and expanded the definitions of those risks:

- Proposal risk: The legal document that defines the item or service procured (the right item), the mutual areas of agreement, and how risks will be allocated and rewarded.
- Surety and liability risks: Protection of the agency’s financial and legal interests (the right price). The contract will define the insurance requirements, bonding requirements, and licensing that are necessary to protect the agency in the event of contract termination or to meet statutory requirements.
- Schedule risk: Ensuring timely delivery (the right time). The contract will contain clear and specific language describing the contract deliverables, delivery terms, and any penalties for late delivery.
- Contractual risk: Establishing change order procedures, dispute resolution process and termination procedures (the right price and time). The contract is a living document and allowances must be made to accommodate unforeseen conditions that may affect the purchase. The contract will specify who has the authority to make changes, how changes will be made, and what changes will be unilateral. The contract will specify how disputes will be resolved if mutual agreement cannot be reached. The contract will specify the termination process.
- Performance risk: Defining acceptance (the right quality). The contract will define the conditions under which acceptance will occur and what type of inspection will be required.
- Price risk: Defining payment terms (the right price). The contract will define how and when the Contractor will be paid.

Based on these risks Davison proposed that 10 types of contract administration problems impact the success of any project [7].

<table>
<thead>
<tr>
<th>Contract Problem</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wrong product</td>
<td>Purchase order or contract clearly identifies correct product, but vendor ships incorrect. No dispute involved.</td>
</tr>
<tr>
<td>Delay</td>
<td>Purchase order has clearly stated completion date. Completion date delayed (any length of time) due to agency or vendor (with or without cause).</td>
</tr>
<tr>
<td>Change order</td>
<td>Change in the scope of work (additional work, money, time), after contract award. Can be requested by either party for any reason.</td>
</tr>
<tr>
<td>Personality conflict</td>
<td>Personality conflicts between agency project manager or staff and vendor project manager or employees. Disagreement between the parties that can not be easily resolved. May involve scope of work, materials supplied, payment schedules, or any other aspect of the contract.</td>
</tr>
<tr>
<td>Definition of acceptance</td>
<td>Completion of project is delayed due to non acceptance of final product. Example: difference in either party’s definition of what was supposed to be delivered or provided.</td>
</tr>
<tr>
<td>Poor performance</td>
<td>Contract clearly states a level of expected performance (this is not in dispute) and quality problems with vendor’s performance of work occur.</td>
</tr>
<tr>
<td>Sub- Contractors</td>
<td>The vendor uses subcontractors not on his payroll to perform any or all of the work. Prior approval, for use of subcontractors, was received.</td>
</tr>
<tr>
<td>Other sources</td>
<td>There are very few vendors that can perform the work.</td>
</tr>
</tbody>
</table>
Risk of failure | The project has a high risk of failure. i.e. new technology, new equipment, new vendor. Project never been done before. Tight timeline or budget.

Cost | Project has a high cost.

<table>
<thead>
<tr>
<th>Goal Criteria</th>
<th>Risk</th>
<th>Contract Problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right Item and Right Quantity</td>
<td>Proposal Risk</td>
<td>Poor Performance; Risk of Failure; Final Acceptance</td>
</tr>
<tr>
<td>Right Price</td>
<td>Surety and liability risk; Contractual Risk; Price Risk</td>
<td>Cost; Change Order; Personality Conflict</td>
</tr>
<tr>
<td>Right Time</td>
<td>Schedule Risk; Contractual Risk</td>
<td>Wrong product; Delay; Change Order; Personality Conflict</td>
</tr>
<tr>
<td>Right Quality</td>
<td>Performance Risk</td>
<td>Final Acceptance; Poor Performance; Risk of Failure; Sub-contractors</td>
</tr>
<tr>
<td>Right Source</td>
<td>Surety and liability risk</td>
<td>Cost; Sub-contractors; Other Sources; Risk of Failure</td>
</tr>
</tbody>
</table>

Table 1: Definition of Contract Administration Problems [7].

Davison, Sebastian & Hartley, mapped of the relationship between procurement goals [8], the 6 types of contractual risks [7] and contract problems [7]. Each of the contract problems represents an outcome of a particular contractual risk and may result in a failure to meet the “5 R’s” success criteria of the project (Table 2) [10].

<table>
<thead>
<tr>
<th>Goal Criteria</th>
<th>Risk</th>
<th>Contract Problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right Item and Right Quantity</td>
<td>Proposal Risk</td>
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</tr>
<tr>
<td>Right Price</td>
<td>Surety and liability risk; Contractual Risk; Price Risk</td>
<td>Cost; Change Order; Personality Conflict</td>
</tr>
<tr>
<td>Right Time</td>
<td>Schedule Risk; Contractual Risk</td>
<td>Wrong product; Delay; Change Order; Personality Conflict</td>
</tr>
<tr>
<td>Right Quality</td>
<td>Performance Risk</td>
<td>Final Acceptance; Poor Performance; Risk of Failure; Sub-contractors</td>
</tr>
<tr>
<td>Right Source</td>
<td>Surety and liability risk</td>
<td>Cost; Sub-contractors; Other Sources; Risk of Failure</td>
</tr>
</tbody>
</table>

Table 2: Mapping of Goals, Risks and Contract Problems [10]

Davison also proposed that each purchase can be placed into one of seven contract types and that each of these contract type shares a similar set of contractual risks and potential contract administration problems (Table 3) [7].

<table>
<thead>
<tr>
<th>Contract Type</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commodities, Small Purchases</td>
<td>MRO (maintenance, repair and operating supplies)</td>
</tr>
<tr>
<td>Capital Outlay</td>
<td>Durable goods over $5000</td>
</tr>
<tr>
<td>Professional Services</td>
<td>Architects, consultants</td>
</tr>
<tr>
<td>Contracted Services</td>
<td>Custom developed and shrink-wrap</td>
</tr>
<tr>
<td>Software</td>
<td>Any type and any dollar amount — New construction or remodeling</td>
</tr>
<tr>
<td>Leases</td>
<td>Leased space or equipment — lease without intent to own</td>
</tr>
</tbody>
</table>

Table 3: Definition of Contract Types [7].

A goal of the 2006 Davison & Sebastian survey was to determine the validity of 2004 framework proposed by Davison & Wright on the perceived consequences of ten types of contract administration problems for each of seven contract types on project success and to determine how likely each of these consequences was perceived to be. The summary of their findings is:

“When contract problems occur, the research found that problematic consequences were more likely than no consequence for all contract types except lease contracts. The results also showed that when problems occur, the severity of the consequences depend on the type of contract. Advance knowledge of the likelihood of occurrence and the severity of consequences will allow procurement professionals to identify the likely contract administration problems for a specific contract type.” [11]

2010 research was conducted by Davison & Sebastian in collaboration with Public Works and Government Services Canada (PWGSC) to assess the general validity of the original 2006 findings and to expand the overall empirical base [10]. Based on the feedback of PWGSC respondents in 2010, the 2006 survey was updated to address previous methodological limitations of using reality rankings instead of ranks. An updated survey was conducted among NIGP members in 2011 [6] and the results compared to 2006 survey findings. The major findings were, that the 2011 response rate was significantly higher than 2006, the overall results for problematic consequences were comparable to 2006: when contract administration problems occurred, problematic consequences were more likely
than no consequences for all contract types except Leases; and the types of most likely to occur problematic consequences depended on the type of contract [6].

The main stream of previous research on the impact of contract administration problems on project success has been based on the idea that prior knowledge of potential problems will aid in better risk mitigation efforts and will lead to more successful projects. A successful project has been defined as fulfillment of “5 R’s” principles such as delivering a product or service in right items, in the right quantity, for the right price, at the right time, with the right quality [8]. This definition of success corresponds with the basic principles of Project Management Success definition [12]. A survey conducted by Baccarini and Collins in 1999 among members of the Australian Institute of Project Management (AIPM), which is a professional body representing project managers and project management users in Australia, is aimed at identification of project success criteria and definition. It showed that there is a preponderance of success criteria defined in the narrow terms of time, cost and quality, including also quality of the project management process as success criteria. Avoidance or minimization of problems is a key theme in all of the research.

Previous research shows evidence of the positive relationship between project management success and product success. This infers that the project management team must constantly monitor their project management performance (i.e. time, cost and quality objectives) and reflect how this performance affects the achievement of product success. A survey-based research on contract management critical success factors, derived from the responses of approximately 400 contracting officers who represent seven Department of Defense (DoD) agencies [13-14] showed the similarities in both project management and contract management critical success factors. This implies that project success factors are quite comparable to success factors in public procurement contract administration. Therefore the quality of contract management in public procurement appears to be one of success factors for public contract administration. A procurement function that can identify risks and provide effective contract management is cited as one of the critical success factors for successful projects [13-15]. The importance of the procurement function and the need for a knowledgeable workforce has been recognized by the U. S federal government [14]. The Defense Acquisition Workforce Improvement Act (DAWIA) [16] was enacted by the United States government to improve the effectiveness of the personnel who manage and implement defense acquisition programs. Educational courses have been developed to provide procurement personnel with the general procurement regulations and best practices and the unique knowledge needed for specific acquisition workforce assignments, jobs, or positions [17].

Previous research supports the value of the procurement function, and provides rationale that procurement is a profession. It is worthwhile to discuss the role a procurement professional has in providing value to the process.

The survey data collected [10-11] has information on both project success (frequency of problems and severity) and characteristics of procurement professionals and their organizations. This data provides us with an opportunity to examine the relationship between personal characteristics such as: experience, certifications, education, or organizational characteristics such as: size of purchasing unit, and project success by examining the relationship of these characteristics with how frequent problems occur and their severity, for a variety of types of contracts.

**METHOD**

In the 2006 and 2011 Davison-Sebastian survey, respondents were asked questions concerning frequency of contract administration problems occurring in each of seven types of contract and their consequences, and were also asked to answer seventeen questions that were directly related either to characteristics of themselves or organizations where they were working. These seventeen questions are represented in Table 4.

<table>
<thead>
<tr>
<th>Question</th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country in which you work</td>
<td>United States/ Canada/ Other (please specify)</td>
</tr>
<tr>
<td>Your organization type</td>
<td>Federal/ State/ County/ City/ School/ Private Sector/ Other (please specify)</td>
</tr>
<tr>
<td>Your current position</td>
<td>Director of Purchasing/ Manager of Logistics or Stores/ Purchasing Manager/ Contract Manager/ Senior Buyer/ Buyer/ Contract Specialist/ Assistant Buyer/ Project Manager/ Engineer/ Other (please specify)</td>
</tr>
<tr>
<td>Are you involved in post-award activities (monitoring performance, delay resolution, change orders, dispute resolution, final)</td>
<td>No/ If requested/ Some purchases/ All purchases</td>
</tr>
</tbody>
</table>
Table 4: Questions respondent’s personal and organization characteristics

One of the limitations of our research lies in the nature of some of the questions which require answers in form of categories that cannot be ranked (e.g. Field of education or Country the respondent works in etc.). Those types of questions were not included in our analysis. We selected the following eleven characteristics for further analysis:

1. organization type;
2. current position
3. how many years has the respondent worked in procurement;
4. how many years has the respondent worked in his/her current position
5. highest level of education;
6. certificates of the respondent;
7. the annual purchasing volume (approx.) for the respondent’s entire agency;
8. the annual purchasing volume (approx.) of purchases made by the respondent;
9. the number of full-time employees in the purchasing unit;
10. the number of full-time employees in the agency
11. the level of purchasing authority of the respondent

The following characteristics were not included for these reasons:

1. Country in which you work (only three possible answers, due to different public procurement systems, principles and legislation of procurement staff education, training and certification in USA and Canada the results would not be relevant for the research goal)
2. Are you involved in post-award activities (monitoring performance, delay resolution, change orders, dispute resolution, final acceptance)? (the survey ended for those who answered negatively)
3. Which post-award activities are you involved in? (the answers are descriptive, no scaling or gradation possible)
4. Please select the activities for which your organization collects data on contract performance. (the same, descriptive answers, no scaling or gradation possible)

5. What best describes your field of education? (descriptive answers, no scaling or gradation possible)

6. What year did you receive your most recent certification (was not included because results on certificate availability showed low relationship with the dependent variables)

The first idea of constructing regression was rejected because the data was presented in form of intervals and categories, not continuous data. Moreover, due to numerous cases of missing data we decided to use contingency tables to identify whether personal characteristics influence the occurrence of contract administration problems.

The use of correspondence analysis for the examination of dependence between variables in contingency tables is described by Moussa and Ouda [18]. Authors consider correspondence analysis to be an efficient method of describing variables relationship nature. The main result of the study is the program CORRESPOND which was written by the authors for the correspondence analysis of contingency tables of maximum thirty-five rows and thirty-five columns.

Tools that can be used in contingency tables analysis in case of categorical variables are described by Beh and D’Ambra [19]. An appropriate way of analysis should be chosen depending on the assumption of a type of relationship between two categorical variables. The authors focus on examination of eight statistical tools that could be used for numerical or graphical description of dependence between two asymmetric categorical variables. Overall, after analyzing two real-life contingency tables Beh and D’Ambra consider such techniques as the Goodman-Kruskal index, graphical displays, confidence circles, dimensionality of the solution to be appropriate for examination of association between two asymmetric categorical variables.

The further research for three variable contingency table is presented in the paper of Simonetti, Beh and D’Ambra, who examine the relationship between various factors and the level of patient satisfaction in a Neapolitan hospital [20]. The authors insist that for the analysis of categorical type of data the use of multivariate contingency tables and non-symmetric correspondence analysis is most preferred.

The goal of the present study is to identify the presence or absence of the dependence between personal characteristics of procurement personnel and contract administration problems in different types of procurement contracts.

Correspondingly personal/organizational characteristics serve as independent variables and types of problems (Wrong product, Delay, Change order, Definition of acceptance, Personality conflict, Poor performance, Sub-contractors, Cost, Other sources, Risk of failure) as dependent variables with type of contract (Commodities, Small Purchases; Capital Outlay; Professional Services; Contracted Services; Software; Construction; Leases) fixed.

The null hypothesis of the independence of specific personal characteristic and the frequency of particular contract administration problem was tested using contingency tables that are built for each characteristic (by each type of contract and type of contract problem). In every table we tested the null hypothesis of independence between personal characteristics of the respondent and the frequency of the problem in a particular type of procurement contracts.

**FINDINGS**

The first personal characteristic variable to be evaluated was organization type (Table 5). Respondents were asked to choose one of the seven types of agency they were working in: federal, state, county, city, school, private sector, other. The descriptive statistics showed that the greatest number of respondents worked in the state and city types of organization with 27% and 25% respectively followed by county agencies with 19 %.

<table>
<thead>
<tr>
<th>Contract Type</th>
<th>Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commodities</td>
<td>- wrong product</td>
</tr>
<tr>
<td></td>
<td>- change order</td>
</tr>
<tr>
<td></td>
<td>- personality conflict</td>
</tr>
<tr>
<td></td>
<td>- poor performance</td>
</tr>
<tr>
<td></td>
<td>- sub-contractors</td>
</tr>
<tr>
<td></td>
<td>- other sources</td>
</tr>
<tr>
<td>Capital Outlay</td>
<td>- delay</td>
</tr>
<tr>
<td></td>
<td>- change order</td>
</tr>
</tbody>
</table>
Summary of Table 5 results

Considering the verification of the main hypothesis about the independence of “organization type” and each of the ten problems for seven types of contracts, it was found out that generally the dependence occurs rarely and predominantly in state and city organizations.

The most significant amount of correlations was found with the contract type Commodities with six problems out of ten. For the contract types Software and Leases, no dependence was discovered between the type of organization and each of the ten problems of contract administration. In the contract type Construction, dependency exists in state and city organizations for the problem of Change orders and Other sources. For the contract types Capital outlay and Professional services correlation was detected in the following contract administration problems: Delay, Change order, Other sources, Poor performance, Cost. For the following contract administration problems: Definition of acceptance and Risk of failure there was no relationship between the type of organization and any of the seven types of contracts. The frequency of occurrence of contract problems encountered by schools and city agencies were similar. In the other types of organizations respondents pointed out the existence of a number of problems but at lower frequency.

Summary Table 6 results for Current Position

The respondents had the following positions to select from: director of purchasing, manager of logistics or stores, purchasing manager, contract manager, senior buyer, buyer, contract specialist, assistant buyer, project manager or other. Almost 25% of all procurement professionals surveyed “other”, this was followed by the positions of “purchasing manager”, “buyer” and “senior buyer” with 15%, 14% and 13 % respectively.

<table>
<thead>
<tr>
<th>Contract Type</th>
<th>Current position</th>
<th>The level of purchasing authority of the respondent</th>
<th>The annual purchasing volume (approx.) of purchases made by the respondent;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commodities</td>
<td>- wrong product</td>
<td>- risk of failure</td>
<td>- personality conflict</td>
</tr>
<tr>
<td></td>
<td>- definition of acceptance</td>
<td></td>
<td>- poor performance</td>
</tr>
<tr>
<td></td>
<td>- change order</td>
<td></td>
<td>- sub- contractors</td>
</tr>
<tr>
<td></td>
<td>- other sources</td>
<td></td>
<td>- cost</td>
</tr>
<tr>
<td></td>
<td>- risk of failure</td>
<td></td>
<td>- risk of failure</td>
</tr>
<tr>
<td>Capital Outlay</td>
<td>---</td>
<td>- personality conflict</td>
<td>- definition of acceptance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- poor performance</td>
<td>- personality conflict</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- sub- contractors</td>
<td>- poor performance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- cost</td>
<td>- cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- risk of failure</td>
</tr>
<tr>
<td>Professional Services</td>
<td>- delay</td>
<td>- cost</td>
<td>---</td>
</tr>
<tr>
<td>Contracted Services</td>
<td>- change order</td>
<td>- wrong product</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- change order</td>
<td>- poor performance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- poor performance</td>
<td>- cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- risk of failure</td>
<td>资产重组</td>
</tr>
<tr>
<td>Software</td>
<td>- delay</td>
<td>- wrong product</td>
<td>- definition of acceptance</td>
</tr>
<tr>
<td></td>
<td>- personality conflict</td>
<td></td>
<td>- personality conflict</td>
</tr>
</tbody>
</table>
| Table 5: Contract administration problems correlating with Organization type.
Table 6: Contract administration problems correlating with Current position, Level of purchasing authority and Respondent’s annual purchasing volume

<table>
<thead>
<tr>
<th>Leases</th>
<th>- poor performance</th>
<th>- personality conflict</th>
<th>- cost</th>
<th>- poor performance</th>
<th>- personality conflict</th>
<th>- cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- wrong product</td>
<td>- delay</td>
<td>- change order</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>- delay</td>
<td>- wrong product</td>
<td>- personality conflict</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The professional’s current position had an effect on the occurrence of two or three problems in 6 contract types. No effect was reported for Capital Outlay. The contract type Commodities had the greatest number of correlations, with five types of problems: Wrong product received, Definition of acceptance, Order change, Other sources, and Risk of failure. The following contract problems - Sub-contractors and Cost – had no correlation with the characteristic “current position” in any of the seven contract types. The occurrence of problems was most frequently noted by the respondents in the post of director procurement (from 20 to 30%) and procurement manager (from 36 to 40%). Furthermore, purchasing managers and managers answered that their most frequently occurring problems are: Delay and Contract changes. Respondents of junior positions (i.e. assistant buyer and project manager or other) encountered different types of problems less frequently than respondents of other positions.

Summary Table 6 results for Level of Purchasing Authority

The survey respondents had the following levels of purchasing authority (the amount they are allowed to spend without supervision) to select from: less than $25,000, $25,000 - $100,000 and more than $100,000. The greatest number of responses (40%) were for purchasing authority more than $100,000. 33% of respondents have authority for less than $25,000.

In cases when correlation between variables was revealed it could be described as follows: with the rise of purchasing authority level from category “less than $25,000” to “$25,000-$100,000” the occurrence of problems decrease. However, if the level of respondent’s purchasing authority grows from $25,000-$100,000 to more than $100,000 the amount and frequency of contract administration problems increase. This trend is valid for every revealed case of problem dependence on the level of NIGP member’s purchasing authority.

The characteristic of Purchasing authority does not have any influence on the occurrence of the following problems: Delay, Definition of acceptance and Other sources for all seven types of procurement contracts. By contrast, at least one problem in every type of contract depends on the level of purchasing authority. For instance, the biggest amount of links was identified for Contracted services contracts (five problems), while the least – for Commodities, Professional services and Leases (Table 6).

Position and titles are often linked to a person’s level of procurement authority and correspondingly, to the annual volume of purchases made by the respondent. So we could expect similar correlation results with contract administration problems for these three characteristics. However, the same problem was shared for each of these characteristics in only two 2 contract types: Commodities (Risk of Failure) and Software (Personality Conflict). When compared to “position title” there was a greater number of problems correlated with level of purchasing authority for every contract type except Commodities and Leases. When compared to annual purchasing volume there was a greater number of problems correlated with level of purchasing authority for every contract type except Commodities and Capital Outlay.

Summary Table 6 results for Annual Purchasing Volume

The respondents had the following levels of annual purchasing volume to select from: less than $5 million, $5-$10 million, $11- $20 million, $21- $50 million, more than $50 million. The biggest share of respondents (29%) reported an annual volume of less than 5 million, followed by 16% reporting an annual volume of $5 to $10 million. Hence, more than a quarter of all people surveyed annually participate in procurement contracts totaling less than 5 million dollars, however it should be noted that 13% of respondents make purchases for more than $50 million.

The discovered link between the variables could be described as follows: the greater annual purchasing volume the respondent has, the more often contract administration problems occur, also with the rise of annual purchasing volume the number of contract types that have contract problems also increases.
In four types of contracts: Professional services, Contracted services, Leases, Construction no dependence of annual volume of purchases and problems of contract administration was revealed for any of the ten problems. In the remaining cases (contracts Commodities, Capital outlay and Software) dependence of the annual volume of respondent’s purchases and several contract administration problems was found.

For the contract problems Wrong product, Delay, Change order and Other sources no correlation was found with any of the seven types of contracts. In case of contracts for Capital outlay and the problem Personality conflict with the growth of annual purchasing volume of respondent the percentage of respondents, who indicate that this problem never arises, reduces from 28.5% (for total purchases less than $5 million) to 12.3% (more than $50 million). The existence of other problem Cost for the same contracts was mentioned to occur “rare” and “sometimes” by 46% and 22.4% of respondents whose annual purchase volume was less than $5 million, while for those who made purchases for more than $50 million the share was 56.9% and 27.7%, respectively.

Summary Table 7, Results for Total Years The Respondent Has Worked In Public Procurement

The respondents had the following ranges to select from: 0-2 years, 3-5 years, 6-10 years, 11-20 years, more than 20 years. The vast majority of people, i.e. 35%, responded that they have worked in procurement for more than 20 years, which is followed by 27% of those who are engaged in this area for 11-20 years. Consequently, more than 60% of NIGP members have rather significant experience in public procurement administration. The proportion of people working in procurement for less than 2 years is only 3%.

<table>
<thead>
<tr>
<th>Contract Type</th>
<th>How many years has the respondent worked in procurement</th>
<th>How many years has the respondent worked in his/her current position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commodities</td>
<td>- wrong product</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>- personality conflict</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- poor performance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- sub-contractors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- risk of failure</td>
<td></td>
</tr>
<tr>
<td>Capital Outlay</td>
<td>- definition of acceptance</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>- personality conflict</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- poor performance</td>
<td></td>
</tr>
<tr>
<td>Professional Services</td>
<td>- risk of failure</td>
<td>---</td>
</tr>
<tr>
<td>Contracted Services</td>
<td>- definition of acceptance</td>
<td>---</td>
</tr>
<tr>
<td>Software</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Leases</td>
<td>- cost</td>
<td>--</td>
</tr>
<tr>
<td>Construction</td>
<td>- wrong product</td>
<td>- personality conflict</td>
</tr>
</tbody>
</table>

Table 7: Contract administration problems correlating with number of years in procurement and in current position

The general trend of the correlation was the following: respondents who worked in public procurement for over six years noted administration problems occurred more often than those with less working experience. In cases when the relationship between personal characteristic of the number of years experienced in public procurement and the problem was identified the dependence was as follows: the longer the respondent works in procurement, the more he/she notes administration problems in government contacts.

Zero hypotheses about the independence of the total amount of years the respondent has worked in public procurement and each of the ten possible problems of contract administration was not rejected for the Software contracts just as for problems Change order and Other sources in every type of public procurement contract. Therefore, no correlation was identified between the experience in procurement and the specified type of contract (Software) and problems.

Conversely, the variables were dependent in contracts for “Commodities” with five 5 types of problems namely Wrong product, Personality conflict, Poor performance, Sub-contractors and Risk of failure. Similarly, the influence of the total amount of years the respondent has worked in procurement was identified in contracts for Capital outlay, Professional services, Contracted services, Leases and Construction with three (Definition of acceptance, Personality conflict, Poor performance), one (Risk of failure), one (Definition of acceptance), one (Cost) and one (Wrong product) problems respectively (Table 7).
Summary Table 7, Results for Years in Current Position

The respondents had the following ranges to select from: 0-2 years, 3-5 years, 6-10 years, 11-20 years and more than 20 years. The biggest share of people surveyed have worked in their current position for 6-10 years and 3-5 years with 23 % and 22 % respectively. Almost 25% of all respondents have worked for less than two 2 years.

The general conclusion to be made from the contingency tables for this characteristic is that in six types of public procurement contracts each of the ten possible administration problems was independent from the amount of years the respondent has spent in his/her current position.

Surprisingly, the analysis failed to reveal the dependence between the “current position” characteristic of the respondent and contract administration problem for all types of contracts and for each of the ten kinds of problems, except for Construction (Personality Conflict). For construction contracts, the frequency of Personality Conflict problem occurrence rises with the increase of number of years spent by the person in his/her current position up to 6 years. With experience for more than 6 years the problem occurs sometimes. Among respondents who have worked in their current position for more than 20 years the problem becomes much rare than in the previous interval.

Summary Table 8, Results for The Highest Level of Education (Table 8)

The respondents had the following levels of education to select from: high school diploma, technical or vocational school certificate, some college, 2-year college degree, 4-year college degree, master’s degree, doctorate degree. The greatest number of respondents (36%) reported having a 4-year college degree, followed by 17% with some college and 16% with a master’s degree. 1% of professionals in procurement have a technical or vocational school certificate and 1% have a doctorate degree. Overall, the average level of respondents’ education is rather high: more than 50% of people surveyed have at least 4-year college degree.

<table>
<thead>
<tr>
<th></th>
<th>Highest level of education</th>
<th>Public Procurement Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commodities</td>
<td>---</td>
<td>- wrong product</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- delay</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- personality conflict</td>
</tr>
<tr>
<td>Capital Outlay</td>
<td>---</td>
<td>- delay</td>
</tr>
<tr>
<td></td>
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<td>- poor performance</td>
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<td>Professional Services</td>
<td>- definition of acceptance</td>
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<td>- personality conflict</td>
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<td>Contracted Services</td>
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<td>- definition of acceptance</td>
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<td>Software</td>
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<td>Leases</td>
<td>- cost</td>
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<td>Construction</td>
<td>- wrong product</td>
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<td>- change order</td>
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<td></td>
<td>- personality conflict</td>
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Table 8: Contract administration problems correlating with Level of education and Certification

Summary Table 8, Highest Level of Education

For every contract type except Commodities and Capital Outlay, a relationship between the level of education of the respondent and the occurrence of contract problem was revealed, it could be concluded that the number of contract administration problems (i.e. their frequency) increases with the level of education of the respondent up to the level of 4-year college degree, and then decreases for the remaining two levels of education. For Commodities contracts, unlike each of the previously discussed characteristics, in the case of education level, there was no dependency between the characteristic and at least one contract problem.
The highest level of education of the respondent did not influence the occurrence of the following contract administration problems: Poor performance, Sub-contractors, Other sources and Risk of failure in any of the contract types.

Summary of Table 8, Results for Certification

The respondents had the following types of professional certifications to choose from: “Professional Certificate public purchaser”, “Professional Certificate in Public Procurement” and “Certificate of Procurement Manager / Professional Certificate in supply chain management”. Considering the fact that respondents could choose one or two, and all three types of certificates, it was decided to create a new variable “number of certificates of the respondent”, which reflects the total number of certificates and takes values from 0 to 3. Therefore, the presence of dependence between the number of certificates and problems of contact administration was verified using the contingency tables.

According to the survey, 52% of respondents do not have any type of certificate, while 37% of NIGP members have one certificate, 9% have two certificates, and only 1% of respondents have all three kinds of certificates. The most common certificate for the respondents is a “Professional Certificate public purchaser”.

Dependence of certificate achievement and contract administration problems was found in only 2 contract types: Commodities and Capital outlay for problems Wrong product, Delay, Personality conflict and Poor performance. The influence is the following: with the increase of the number of certificates (from 0 to 2), the frequency of problems occurrence grows. Among respondents who have all three certificates listed in the survey, contract administration problem occurred rarely. To sum up, the more certificates (0 to 2) the respondent has, the more administration problems occur in public procurement contracts for “Commodities” and “Capital outlay”.

The results of testing the hypothesis of independence of the respondent’s number of certificates and each of the ten problems for seven types of government contracts are as follows: the hypothesis was not rejected (i.e. these variables were independent) for each of the ten problems in the following five types of contracts: Professional services, Contracted services, Software, Leases, Construction. In addition, the number of certificates does not influence the existence of such problems as Definition of acceptance, Change order, Sub-contractors, Cost, Other sources and Risk of failure in any of the seven types of contracts.

Summary Table 9, Results for The Annual Purchasing Volume For The Entire Agency

The respondents had the following annual purchasing volumes to select from: less than $5 million, $5 - $20 million, $21 - $50 million, $51-$100 million, $101- $500 million, more than $500 million. The greatest number of respondents (23%) work in organizations, where the amount of annual purchases is 101-500 million dollars. 16% of respondents work in organizations where the annual purchases exceed $500 million. Less than 2% are employed in organizations with annual purchasing volume $51- $100 million. Therefore, the total number of respondents who work in organizations with an annual volume of purchases more than $51 million is 53%.

<table>
<thead>
<tr>
<th>The annual purchasing volume (approx.) for the respondent’s entire agency</th>
<th>The number of full-time employees in the agency</th>
<th>The number of full-time employees in the purchasing unit</th>
</tr>
</thead>
</table>
Table 9: Contract administration problems correlating with Annual agencies purchasing volume and number of employees in the agency and in the purchasing unit

Summary of Table 9, Results for Agency Annual Purchasing Volume

It may be concluded that the relationship between the approximate annual volume of procurement in respondent’s agencies and contract administration problems occurs for all seven types of contracts and takes the following form: the higher the annual amount of agency’s procurement is, the greater the likelihood of problems in every type of contract.

As a result of testing the hypothesis of independence between the annual purchasing volume and each of the ten problems for seven types of contracts, it was revealed that the dependence exists in every type of contract for some problems and in Capital outlay and Professional services contracts — for each of the ten possible problems. In Capital outlay contracts, such problems as Change order (12%) and Other sources (9%) occur often, and the remaining eight problems are mentioned as occurring sometimes by the majority of respondents.

Summary of Table 9, Number of Full-Time Employees in the Agency

The greatest number of respondents (33%) works in organizations that have 2000 employees. 21% work in organizations with personnel between 401-1000 employees. In total, just about 50% of respondents work in large organizations, with at least 1000 employees.

The revealed influence could be defined as follows: the more full-time employees in the agency, the more likely the occurrence of a contract problem.
The characteristic of the size of an agency influences the occurrence of problems in every type of contract. For five types of contracts multiple types of problems were influenced. The greatest number of links were found for Commodity purchasing as well as for the problem of Delay.

Summary of Table 9, Results for the Number of Full Time Employees Working in the Purchasing Unit

The respondents had the following levels to select from: 1 or less, 2-5 employees, 6-10 employees, 11-20 employees, more than 20 employees. The majority of respondents (28%) reported 2-5 full time employees in their procurement department. 20% reported 6-10 employees in the department. Thus, nearly 50% reported working in a purchasing department with less than 10 employees.

Overall, as the number of full-time employees in the procurement unit of the agency rise some administrative problems for a number of types of government procurement contracts increase, too.

In six types of contracts the number of full-time employees in procurement unit and the problems of contract administration are dependent for 4 or 5 problems in each type of contract. For instance, in contracts Software such problems as Definition of acceptance and Personality conflict tend to appear more often with the growth of the number of staff in the procurement unit: the proportion of respondents who indicate the absence of these problems reduces, respectively, from 42% to 17% and from 42% to 30% with an increase in the number of full-time employees in purchasing department. At the same time the share of respondents who indicate the existence of these problems (such as "sometimes") increased from 11.5% to 30% and from 4% to 21%, respectively. No dependency was revealed for Lease contracts and any type of problem as well as no dependency was discovered for Cost problems and any contract type.

SUMMARY AND CONCLUSIONS

1) As a result of the analysis of relationship between some of the respondents' personal and organizational characteristics and contract administration problems, it was found that certain characteristics may influence the occurrence of particular types of problems in a number of procurement contracts.

2) Surprisingly, certification and experience were insignificant for the fact of problem occurrence, the most significant were characteristics that describe the size of an organization or a purchasing unit and the purchasing volume. If we rank personal characteristics by the number of cases of links with contract administration problems occurrence, we get the following table (Table 10):

<table>
<thead>
<tr>
<th>Rank</th>
<th>Personal characteristic</th>
<th>Number of links to contract administration problems occurrence</th>
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<tbody>
<tr>
<td>1</td>
<td>Annual purchasing volume of an agency</td>
<td>49</td>
</tr>
<tr>
<td>2</td>
<td>Number of employees in the purchasing unit</td>
<td>26</td>
</tr>
<tr>
<td>3</td>
<td>Number of employees in the agency</td>
<td>23</td>
</tr>
<tr>
<td>4</td>
<td>Purchasing authority</td>
<td>18</td>
</tr>
<tr>
<td>5</td>
<td>Current position</td>
<td>16</td>
</tr>
<tr>
<td>6</td>
<td>Organization type</td>
<td>15</td>
</tr>
<tr>
<td>7</td>
<td>Annual purchasing volume of the respondent</td>
<td>14</td>
</tr>
<tr>
<td>8</td>
<td>Level of education</td>
<td>13</td>
</tr>
<tr>
<td>9</td>
<td>Years worked in procurement</td>
<td>12</td>
</tr>
</tbody>
</table>
Accordingly, the most significant impact on the frequency of occurring contract administration problems have those characteristics describing the size of a purchasing agency or unit, i.e. the annual purchasing volume of an agency and the number of employees of an agency or purchasing unit. Indeed, these characteristics reveal relationship with all types of problems in almost all types of procurement contracts. Moreover, the relationship between annual purchasing volume of an agency in the contracts for Capital Outlay and Professional Services exists for every problem.

The common trend of this influence is the following: the share of respondents that admitted the presence of particular administration problems increased with the growth of the annual purchasing volume of the agency. As well as the more employees in procurement unit, the more often contract administration problem arises. Consequently, it could be concluded that the higher the annual amount of agency’s procurement, the greater the probability of occurrence of contract administration problems. Another explanation might be that in large agencies, more Construction and Software contracts are probably undertaken and managed by the procurement staff. In small agencies construction is less frequent and typically the construction management is outsourced. So small-sized agencies can outsource large and complex purchases that might entail some contract administration problems, therefore the number of administration problems may reduce for them.

3) The duration of work at the current position does not have any impact on the occurrence of the contract administration problems. Almost the same is true for the characteristic of certificates availability. The latter revealed links with problems occurrence only for Commodities and Capital Outlay. With the increase of the number of certificates (from 0 to 2), the frequency of some problems occurrence (namely Wrong product, Poor performance, Personality conflict and Delay) grows too. Among respondents who have all three certificates listed in the survey, contract administration problem aroused rarely.

4) Such characteristics as “level of education”, “experience of the respondent in procurement” have an impact only on a small number of problems in certain types of contracts. Generally the number of emerging contact administration problems (i.e. their frequency) increases with the level of education of the respondent up to the level of four-year college degree, and then - decreases for the remaining two levels of education. Concerning the procurement practice experience, the dependence was as follows: the longer the respondent works in the procurement, the more often he/she notes the fact of occurrence of contract administration problem.

5) The remaining characteristics that reflect the position or authority of a respondent (“purchasing authority”, “current position”, “the annual purchasing volume of purchases made by the respondent”) influence a larger number of problems in different types of procurement contracts. Generally respondents of the junior positions (i.e. assistant buyer and project manager or other) encounter different problems of contract administration less than the respondents of other positions; as well as the greater the volume of purchases of the respondent, the more often contract administration problems occur. On the other hand, the trend of the relation between problems frequency and purchasing authority is not that straight. With the rise of purchasing authority level from the category less than $ 25,000 to $25,000-$100,000 the incidence of problems decrease, however, if the level of respondent’s purchasing authority grows from $25,000-$100,000 to more than $100,000 the amount and frequency of contract administration problems increase, too.

6) As far as the organization type is concerned, we cannot depict any relationship due to the categorical nature of the variable, but it can be noted that most of the problems arise in State, County and City types of organizations. The hypothesis about the independence of the organization type and each of the ten problems was not rejected in three types of contracts (Leases, Software, Construction). For the remaining types of contracts the characteristic has an influence on some problems ranging from two to six problems.

**DISCUSSION**

The challenge from a policy perspective is that the study shows the relationship of personal characteristic factors that are relatively easy to measure, such as education, certification and years of experience; and the number and

<table>
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<th>Certificates</th>
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<tr>
<td>10</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Years worked in current position</td>
<td>1</td>
</tr>
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Table 10: Rating of characteristics significance for problem occurrence cases
seriousness of contract administration problems encountered is not very strong. How does the organization and the professional tackle the challenge of describing which attributes the professional needs to be most successful in managing projects? How should job descriptions, minimum educational and experience requirements, compensation and training programs be structured?

This challenge is not unique to public procurement. Numerous studies have been conducted on key factors for improving student learning. These studies have shown that on average, the relationship between a teacher's highest degree obtained or level of experience and certification to student outcomes is very weak. Goldhaber states “the evidence shows that good teachers make a clear difference in student achievement. The problem is that we don’t really know what makes a good teacher”. He further states the measurable aspects of a teacher’s quality: experience, education level, certification status, etc, make up 3% of the differences in student achievement that are attributable to a teacher’s influence. The other 97% are intangible aspects such as enthusiasm and skill in transferring knowledge.

Previous research on the role of public procurement has recognized that public procurement performs multiple functions for their agency. One of the functions is that of a gatekeeper; ensuring public dollars are spent via a fair and transparent process. The attributes typically ascribed to these responsibilities are clerical in nature and include personal characteristics such as a certification and detailed knowledge in the procurement process. Another procurement function is to provide strategic leadership on developing innovative solutions for complex procurements. Personal characteristics such as: extensive written and verbal communication skills, complex problem solving, which are not easy to measure, are often listed [4]. In the Education field research on the need for a multiple attribute approach that include difficult to measure attributes has been conducted. Goldhaber proposes going beyond the easy to measure attributes and adopting a multi attribute approach that includes: teacher degree and experience levels, subject matter knowledge and improving their pedagogical knowledge, teaching teachers how to teach [21].

Numerous procurement agencies are using a multiple attribute approach that includes attributes outside of easily measurable ones. Basheka surveyed public procurement professionals in Uganda listed the 20 skills most required by local government. The skills listed are universally applicable to any procurement department, but are a challenge to measure and quantify: the Ability to develop supplier relationships, Skills of verbal communication, Possession of an inquisitive mind, Ability to solve noble problems, Interpersonal skills [22]. NIGP has recognized the need for multiple attribute approach to public procurement certification by offering 2 types of certifications: Certified Public Procurement Buyer (CPPB) which places emphasis on demonstrating a comprehension of procurement practices; the other certification, Certified Public Procurement Official (CPPO), places an emphasis on demonstrating comprehension of leadership, and communication skills. Both certifications require a formal degree, experience and testing. The job descriptions proposed by Prier, McCue, Steinfeld, also support the concept of a multiple attribute job description that includes attributes that aren’t easy to measure [4]. In the United Kingdom discussion on the use of continuous improvement through self-assessment when assessing a procurement departments success in delivering high-quality public services and best value for money involves the need for multiple attributes when identifying key performance indicators for the areas of process, skills and development and deployment and leadership [23].

There are many ways to measure successful outcomes in public procurement, project success due to lack of problems is just one. Ensuring a fair process, improving transaction efficiency, customer service, cost savings, and achieving best value are also important indicators of success. Research points to the need for a procurement professional to possess multiple attributes, beyond the easy to measure one, to be successful in each of these outcomes. For the professional and the agency achievement of these attributes comes at a cost. How does the professional or the agency determine which attribute(s) contribute the most to success? If an attribute is not easy to measure, how will its value be gauged? As public procurement continues down the path of demonstrating it is a profession, there will be challenges and opportunities for the agency on how to determine the value of the professional in the process, and for the professional as to how best improve their value to meet the demands of the profession.

ACKNOWLEDGEMENTS

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REFERENCES


ABSTRACT

In June 2013 the Court of Justice of the European Union (CJEU) gave a ruling in a dispute between a supplier and a Union of Municipalities in Germany, the Pie enbroc case [1]. The background to the main proceedings was a contract between the Union and one of its members (the city of Düren), under which the city would perform cleaning services in the Union's premises located in the city. A vendor protested against the contract and argued that the contract fell under Directive 2004/18 and should have been procured.

The CJEU stated that the contract in question was to be considered as a public contract which would normally fall under the EU procurement rules. The Court then examined whether the two exceptional situations that it developed in the case ec al [2] and in the case amburg Chamber [3] were applicable. The so-called Teckal-exception (also called the In-house exception) allows a contracting authority to award a contract without tendering to a supplier that the authority controls (typically a municipal subsidiary), if the supplier's main activity is to serve the contracting authority. This exception was however not applicable because the Union of Municipalities did not control the city.

Further, the CJEU examined whether the exception for public-public cooperation was relevant (the Hamburg Chamber case). Under this exception contracts between public agencies do not need to be procured if the agreements are solely between public units, without the involvement of any private party, no private provider is given any advantage over its competitors and the cooperation solely is governed by considerations and requirements that are designed to achieve objectives in the general interest. The CJEU found that neither of these exceptions was applicable, why the contract should have been awarded under the EU procurement rules.

The presentation will examine under which circumstances it is possible for contracting authorities to cooperate without prior procurement, considering the latest jurisprudence of the CJEU.

INTRODUCTION

There are no provisions regarding cooperation regarding purchases between contracting authorities in the EU Directives adopted in May 2004 [4]. Since there are no explicit exceptions, the general rules is that such procurement must follow the provisions of the Directives. The interesting question to be examined in this paper is when it is possible for contracting authorities to purchase goods, services and works from each other without putting the purchase out for competition according the to the EU Procurement Directives.

The only guidance today on the possibility for contracting authorities to cooperate when fulfilling needs in the general interest is therefore the jurisprudence of the CJEU. On the question of public cooperation, the CJEU has delivered three important cases, the above mentioned ec al case, the amburger Chamber case and the Pie enbroc case, which will be examined in the next paragraphs.
THE TECKAL CASE

The general rule of the awards of contracts of goods, services and works above the thresholds of the provisions of the Public Procurement Directives is that they have to be put out to competition [5]. The CJEU however upheld in the case *ec al* that the award of contracts between legally separate persons can take place without competition, provided that two criteria, the so-called *ec al criteria* are met [6]. The first criterion is the so-called control criterion, according to which a contracting authority exercise control over another legally distinct person similar to that it exercise over its own departments. The second criterion is the so-called activity criterion, according to which the legally distinct person, from which the purchase is made, must carry out the essential part of its activities with or on behalf of the authority or authorities that holds it. Assuming that the two mentioned criteria are met, the contract is deemed not to comply with the public procurement definition of contracts, and the award is considered instead to be an agreement in-house that are not covered by the Directives. It is also possible for several contracting authorities to jointly own and control a legally distinct person. In these cases, the cooperation carried out in the legally distinct person is called institutionalized cooperation.

In later decisions, the CJEU has developed the control and operational criteria. It has a developed a number of objectives, such as in the case *ehil inen and er eystalo ealhcare* [7], where it was establish that when there are private shareholders in the legally distinct person, the control criterion could not be fulfilled. The contract should in such cases be awarded in accordance with the Directives. In the case *ragsa* [8] the CJEU found that both criteria were met, because the legally distinct person was a dependent company that could not refuse to deliver to the owner, it was not free to determine its prices to the public and it performed the bulk of its activities to the contracting authority. In November 2012, the CJEU the CJEU found in the case *conord* [9] that that is was not enough for a contracting authority to only own shares in shareholders company to be considered to have a control over the company. It is also required that all contracting authorities participate in the company's governing bodies.

An interesting question is whether Teckal criteria are applicable to the award of contracts in the Primary Law of the EU. The question arose in the case *Par ing ri en* [10]. The CJEU referred to its previous practice regarding the Teckal criteria, and found that this only related to whether the contracts would have been covered by the Procurement Directives. For the Procurement Directives to be applicable, it is *inter alia* a condition that a written contract has been concluded. The CJEU noted, however, that there was no requirement for writing in the primary law provisions for those to apply. CJEU stated that the considerations relating to the Teckal criteria despite it being only case law referring to contracts covered by the Directives, also could be transferred to the award of service concessions. The general principles of equality and non-discrimination on grounds of nationality in Article 18 in the Treaty on the Functioning of the European Union (TFEU), Article 49 TFEU and Article 56 TFEU are equally applicable to grants of a contract in which a public authority entrusts the supply of economic activities to a third party, whether in the public procurement directives or as award of a service concession. The Court concluded that:

> European Union legislation in the field of public procurement or service concession will not apply when a public authority with its own resources - administrative, technical and others - performs public interest tasks assigned to them, without turning to external devices.

The provisions of Primary Law are therefore not applicable when a contracting authority exercises control over a legally distinct person, which is equivalent to that exercised over its own departments, if the legally distinct person carries out the essential part of its activities for or together with the contracting authority or authorities holding it. The award of contracts below the EU thresholds and of B-services falls under the same rules and principles in Primary Law as service concessions, if they are of a specific cross-border interest. It is therefore a likely conclusion that the reasoning of the CJEU in relation to Primary Law also includes awards of these types of contracts.

Here may also be mentioned the case *Commission S ain* [11]. The CJEU held that a provision of the Spanish law that exempted all awards of public contracts between authorities and publicly controlled bodies from the Spanish procurement regulations were unlawful. It is therefore not possible to make any general exemption from the regulatory framework for public procurement. Instead, an *in casu* assessment must be made, in which the jurisprudence of the CJEU must be considered.
THE HAMBURGER CHAMBER CASE

It is possible for contracting authorities to jointly perform tasks assigned to them, without the Procurement Directives being applicable even when cooperation takes place in unregulated forms. In the case _Hamburger Chamber_ four contracting authorities had concluded an agreement directly with the City of Hamburg for the disposal of waste in a new incinerator [12]. The agreement committed the company Hamburg Stadtreinigung to provide a capacity of 120,000 tonnes per year for the incineration of waste in the plant. The contracting authorities undertook to pay an annual fee, which was partially fixed, partially due to the amount of waste delivered. The question was whether the cooperation was covered by the German public procurement regulations. The CJEU began by emphasizing that EU law does not require contracting authorities to use any particular legal form in order to jointly ensure that a public service task is performed. Next, the Court held:

It must be observed though, first, that Community law does not require public authorities to use any particular legal form in order to carry out jointly their public service tasks. Secondly, such cooperation between public authorities does not undermine the principal objective of the Community rules on public procurement, that is, the free movement of services and the opening-up of undistorted competition in all the Member States, where implementation of that cooperation is governed solely by considerations and requirements relating to the pursuit of objectives in the public interest and the principle of equal treatment of the persons concerned, referred to in Directive 92/50, is respected, so that no private undertaking is placed in a position of advantage vis-à-vis competitors...

For a formless cooperation between contracting authorities to be excluded from the scope of EU law, it is required that it is done without the participation of private capital, that the agreement is a true partnership that aims to jointly conduct a public task and that the cooperation solely is governed by considerations of general interest. If the conditions in the case _Hamburger Chamber_ is met, such cooperation between contracting authorities do not affect the main objective of the Community rules on public procurement, i.e. the free movement of services etc. and the undistorted competition in all Member States. The ruling is however not entirely clear and has given rise to some discussion in the legal literature.

Steinicke notes p.a. that the CJEU mainly focused on two aspects in the _Hamburger Chamber_ case; it involves the utilization of a public interest and the process takes place without the involvement of private participants [13]. Regarding the issue of public interest, he notes however, that the Court does not clarify what is covered by a general interest. He therefore argues that the question marks regarding contracting authorities opportunities to collaborate formless persists even after this ruling.

THE PIEPENBROCK CASE

In the _Piepenbrock_ case the company Piepenbrock had performed property cleaning for an association of municipalities called Kreis Düren [14]. The association included the City of Düren. Under the law on municipal collaboration in North Rhine-Westphalia region it was possible for local authorities and local authority associations to agree for one of them to take over tasks from the other party, a so called delegation agreement, or for one of the parties to undertake to perform such tasks for the other parties. Appropriate compensation for such agreements was to be prescribed in the agreements.

Kreis Düren drew up a draft agreement with the City of Düren, according to which Kreis Düren would transfer responsibility for the cleaning of their office government and school facilities in the region to the City of Düren for compensation. The City of Düren was to be solely responsible for compliance in regards to Kreis Düren's obligations relating to the cleaning of their buildings in the region. Kreis Düren reserved the right to verify that the task was performed correctly and could unilaterally terminate the agreement if the City of Düren did not fulfil the contract obligations. The City of Düren had the right to hire a third party for the actual execution of the contract and the contract period was initially set to two years.

The company Piepenbrock appealed, claiming that Kreis Düren was prohibited from entering into the relevant contract without tendering. The basis of the claim was that the cleaning service was a service that was requested on the market and could also be provided by private providers. There was no question of a kind of in-house contract, for which exemption from the procurement rules were applicable, since Kreis Düren had no control over the City of Düren. The national court held that there were a number of ambiguities regarding how the contract would be assessed and requested a preliminary ruling from the CJEU.

Initially, the CJEU noted that Article 1.2 of Directive 2004/18 includes all written contracts for pecuniary interest concluded in writing between a contracting authority and an economic operator, whether the latter also is a
contracting authority, not primarily engaged in business for profit, is organized as a business or not permanently present in the market. Further, the CJEU found that the activities covered by the agreement constituted services in the Directive 2004/18, and that the contract had been concluded for pecuniary interest since compensation was paid under the agreement. In summary, the Court found that the agreement in principle constituted a public contract.

Further, the CJEU considered whether there were grounds for finding that the agreement was exempt from the obligation to use the procurement regulation. The Court noted that the criteria as set in the ec al doctrine were not met. This was because the control criterion was not met, but also because the City of Düren did not perform the major part of activities for Kreis Düren. Further, the Court found that there was no question of excluding the contract from the procurement regulations due to collaboration between public entities, as established in the case amburger Chamber. It was clear from the national court's reference that the agreement did not appear to be designed to establish cooperation between the both contracting authorities for the purpose of fulfilling a common public service mission. Moreover, the City of Düren could rely on a third party to complete the assignment, whereby a specific supplier could benefit from the agreement compared to other companies operating in the same market. The CJEU therefore held that an agreement such as the current was a public service contract within the meaning of Article 1.2 of Directive 2004/18.

CONCLUSIONS

This paper has examined the three leading cases in the area of public procurement regarding various forms of collaboration between contracting authorities. So what is the conclusion, when can contracting authorities collaborate without having to put the collaboration out for competition?

In the jurisprudence after the ec al case is has established that contracting authorities can collaborate by creating joint companies. The condition is that they have a control over the independent company equal to that they have over their own departments, and that the separate entity's operations is mainly carried out for or in conjunction with the contracting authorities. It is also a condition that no private companies are involved in the cooperation.

In the amburger Chamber case it was established that contracting authorities can cooperate in an association of municipalities and make joint procurements, in which one of the parties will be doing the procurement and charge the others for the actual cost of procuring the contract. The prerequisite for this collaboration is that the contracting authorities through the cooperation perform some type of public service, which is covered by their mission to accomplish.

However, it is not possible for one contracting authority to acquire the services of another, without other cooperation than that one contracting authority pays and the other delivers. In the decisions in the Pie enbroc case, the CJEU states that an agreement in which a contracting authority provides another contracting authority with the task to perform services for a contribution, while it reserves the right to verify that the task is performed correctly and the performing authority may use a third party, is a public service contract. The CJEU thereby confirms its previous jurisprudence, in that none of the circumstances identified in the ec al case or in the amburger Chamber case existed. The Court has thus, instead of creating a new exemption from the Procurement Directive, clarified that the legal position is still the same and that there are only a limited number of exceptions to the procurement requirement for the award of public contracts.

The two relevant criteria for not considering the contract in the Pie enbroc case to be excluded from public procurement, is that it could be established that there was a of provision of services for which compensation was paid, and the City of Düren had the opportunity to hire a third party to perform the services. This enabled a supplier in the relevant market being awarded a contract for the performance of cleaning for a contracting authority's behalf, without having been subject to previous competition. If the Court had held that the contract in question was not acting as a public contract in meaning of the Directive, the practical effect had been that contracting authorities had been able to circumvent the procurement regulations. They had been able to establish agreements among themselves in which one of them later takes over the other authority's obligations with the right to engage a third party for the performance of a specific contract. This later authority had then been entitled to contact a private supplier and let it perform the services in question without ever putting the contract out for competition.
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[7] Case 215/09, Mehiläinen och Terveystalo Healthcare. See also Case 26/03, Stadt Halle och RPL Lochau, Case 573/07, Sea and Case 196/08, AcoSet.

[8] Case 295/05, Tragsa.


[12] Case 480/06, Hamburg Chamber.


Public Procurement Mechanisms for Public-Private Partnerships

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Annotation

The idea of the federal law on Public-Private Partnership (PPP) has been widely discussed in the professional circles: on April 26, 2013 the State Duma of the Russian Federation has adopted the draft federal law on PPP in the first reading, the process, including parliamentary hearings, is in progress to prepare adoption of the draft law in the second reading. To date the law on PPP has been adopted in more than 60 territorial subjects of the Russian Federation and some subjects (e.g. the Perm Territory) passed the bill on PPP in the first reading and suspended the process pending the decision on the adoption of the federal law. Abroad some developing countries have adopted special laws on PPP, while in developed countries PPP is regulated by the legislation on public procurement and corresponding bylaws. If contracts, concluded between the government and private businesses, are regulated by the public procurement legislation, then why do we need the special law on PPP? This article shows that PPP allows to run socially important projects, which are unachievable in the framework of standard contracts, provided that uncontracted benefits are offered to be gained by private partners from participation in the projects of the government (such as risk reduction, gaining a reputation, getting an access to additional resources, a relief from bureaucratic burden, etc.). Thus, if the institutional environment guarantees such benefits to be gained, then there is no need to have specialized law on PPP projects since all projects are feasible under standard contracts, otherwise the Law on PPP law is appropriate if it establishes the institutional architecture to ensure the above benefits.

Key words: Public-Private Partnerships (PPP); the public procurement; the Law on PPP; economic efficiency; public welfare; contracts.

Introduction

Public-Private Partnership allows to run projects that (a) cannot be implemented by the private sector alone, for example, due to their low profitability, (b) cannot be effectively performed by the public sector, for example, due to high costs to the society, and (c) are desirable from the standpoint of their social significance. The document provides an analysis of PPP and its associated costs and benefits, compared with other forms of business organization [1]. Considering PPP as a consolidated enterprise run by the government and private business, based on partnership principle (the parties are interested in the success of the partner), allows to define the conditions under which PPP is preferable to other forms of business organization in terms of the provision of public goods. At that there are no additional assumptions made about the type of the contract to be concluded between the government and the private business, used as a basis to open PPP. Despite the convenience that this concept provides in analyzing the nature of PPP, the unsolved question that remains to be is how the partnership principle is built to distinguish PPP from other forms of interaction between the government and businesses. If PPP activity can
be organized in the framework of standard contracts, then what makes such "partnership" to grow into something bigger and to exceed the limits of the regular meaning of "cooperation"?

To answer this question it is necessary to analyze PPP from the standpoint of the contract theory. If we consider PPP as a complex project (for example, infrastructure project), consisting of separate tasks (for example, the construction and maintenance of the infrastructural asset), then the government addresses the problem, related to the delegation of some (or all) tasks of the project to the private sector and to the selection of the form of the contract that is optimal for such delegation.

This approach ("splitting") can be traced, for example, in works of Bennett J., Iossa E. [2], Martimort, D., Pouyet J. [3] and Maskin E. and Tirole J. [4]. However, the split of the project neglects the synergy effect, such as a possible efficiency increase through shared knowledge and skills between the parties participating in the project and working together to accomplish one task. In this article we apply a different approach when PPP is considered as a co-production project. This article raises the question on what is the most optimal form of the benefit production - public, private or mixed one. Similar positions have been used to analyze PPP, for example, by Bettignies J.-E. and Ross T. [5] and Hoppe E., Schmitz P. [6]. In this paper we define optimality conditions of the mixed form, followed by the analysis made from the standpoint of co-production with the application of the contract theory under co-production conditions proposed by Roels G., Karmarkar U. and Carr S. [7]. The study, conducted by them, showed that not all projects can be performed within the framework of standard contracts (cost reimbursement contract and performance based management contract), which is determined by impossibility to attract private contractor (project co-producer) due to low project profitability and high information costs. The article affirms that such contracts can be implemented through PPP. This allows identifying specific partnership benefits as compared to outsourcing and other forms of interaction between the government and businesses.

The key findings made are the following: PPP is justified in cases, when the private business can derive additional benefits from the partnership that are not usually available within the framework of the standard contract. For example, when the joint execution of the project offers bureaucratic problems to be addressed by the contracting authority, the private sector has more incentives to get engaged into such project, compared to the standard outsourcing. Reputation acquisition in the market increases the number and scale of future orders and allows the private businesses to take upon themselves some part of the possible short-term losses, hoping to cover them in the future. The state guarantees open an access to loan resources, especially when it comes to infrastructure projects for which funding of the World Bank and of the EBRD are available but exclusively for public borrowers. The involvement of the state to the organization of the joint business can reduce costs at the initial phase (start-up costs). Finally, in close co-production improved transparency between the partners can be expected, thus, reducing verification and reporting costs.

Thus, the Law on PPP should be aimed at developing the institutional environment to ensure the above benefits. For example, PPP Development Agency (similar to Partnerships UK in the UK or Central PPP Policy Unit in Ireland) reduces the costs for establishing of a joint venture with the state, the institute of state guarantees, provided for loans, reduces funding costs; and simplified reporting requirements reduce verification costs, etc. If the institutional environment currently existing in the economics provides for the necessary conditions (for example, the costs of setting-up the business are low, bureaucratic obstacles are minimal, reporting has been simplified and loans are available at low interest rates), then the need for special law on PPP (or, more accurately, the special provisions on the institutional environment to ensure benefits for PPP) would disappear.

The approach, proposed in this article, helps to explain a phenomenon that seems to be strange at first thought: the laws on PPP are actively being adopted in developing countries and in the countries with economies in transition, but developed countries often lack them. For example, in July 2013 the preparation has been announced to start the work on the adoption of the Law on PPP in Ghana and in May of the same year the Law on PPP has been enacted in Thailand, in Kenya the Law on PPP has been adopted in March 2013. This list can be continued. At that there is no Law on PPP in UK, which is replaced by recommendations of the Ministry of Finance on how to apply public procurement legislation. In the U.S. there is no federal Law on PPP, though public procurement is regulated centrally, moreover 32 states have passed their own laws on PPP in 2012 (see [8]). The European Commission clarifies how to apply the laws on public procurement and concessions in so far as they relate to public-private partnerships. [9]

The report of the European Bank for Reconstruction and Development on the effectiveness of the legislation that regulates public-private partnerships in 34 countries with economies in transition, indicates that 17 countries demonstrate high-level compliance with international standards - in these countries the Law on PPP has been already adopted, and only in seven countries the compliance with international standards is low - these are the
countries where the special law on PPP or the law on concessions have not been adopted [10]. At that the availability of the law and its high compliance with international legal standards does not guarantee its effective functioning: the EBRD indicates to the low efficiency of these laws in most cases and notes that in 27 of the 34 studied countries the institutional environment (i.e., the availability of special centers/agencies to work on PPP issues) did not reach even a moderate level of development. In particular, the report concludes that: "without having in place the necessary support of the state the probability to have a large number of PPP projects emerged would be low; thus, the law would apply only to the small number of exceptional projects, supported by the state for one or another reason" [ibid., p. 16].

There is no common understanding on the necessity (or lack of such necessity) to adopt the law on PPP. Moreover, the lack of a direct link between the presence of Law on PPP and the effective work of partnerships creates some concerns, which follows from the above-mentioned report, issued by the EBRD. In the academic literature the arguments are cited to list the pros for and cons against the PPP. According to the authors, such diversity is explained by the institutional context. Hence, conclusions on the desired content of the law on PPP are determined.

The next section provides an analysis of PPP features from the standpoint of the contract theory. First of all, there will be defined the conditions under which the cooperation between the public and the private sectors is desirable, and based on the properties of optimal contracts there will be shown that even the most optimal contracts may not ensure the implementation of socially significant projects under certain conditions, while PPP conditions these projects can be implemented. This allows to formalize the partnership principle and to show that it characterizes the institutional environment to the greater extent. Thus, the role of the law on PPP is reduced to the formation of the required institutional environment, since the system of contractual relations between the state and the private sector, as well as the principles of selection of private partners, is the prerogative of the public procurement legislation.

Optimal contract

If we consider PPP as the form to organize a joint business between the government and private sector with the following two conditions satisfied - the consolidation of resources and the partnership principle, - then the rationale to have PPP is possible if the contract between the state and the private sector cease to be optimal upon the violation of one of these conditions at least [1]. In order to understand how and under what conditions these two elements provide for optimal PPP, we apply the theory of contractual relations under the co-production conditions, as proposed in the paper [7]. The focus put on co-production allows concentrating on projects where resources are consolidated and to identify the cause, leading to the inefficiency of standard contracts for such projects, and to show how to increase the efficiency through organizing the partnership.

Consolidation of resources

The project participant has comparative advantages in terms of supply of resources (human, capital, financial or immaterial resources), if the project participant can afford it at a lower price than (any) other partner. From the standpoint of costs, associated with the supply of resources, if one of the project participants has comparative advantages in terms of all resources, then co-production is not profitable, because the implementation of the project only by one of the partners minimizes the costs. Thus, the joint project of the state and the private sector may become optimal (socially profitable) only when both the state and the private sector have comparative advantages in regards to different resources. For example, the provisions of the European Commission state that: "Under PPP model it is recognized that each party has certain advantages to implement specific tasks in comparison with the other party". Moreover, each party shall supply only that resource which has comparative advantages and reduce the investment of other resources to the minimum.

The private sector decides to join the partnership by comparing benefits it gets from participating in the proposed project and the benefits it gets from alternative projects (or "benefits" from non-participation). You can define a cutoff threshold as the minimum benefit that makes the private party to be willing to participate in the project. If the income that the private party draws from participating in the joint project with the state is below the cutoff threshold, then the joint project is unfeasible. The cutoff threshold is equal to the sum of sunk costs (costs to be incurred to start a joint business), a reimbursement for the supplied resources (including human and intellectual resources) and a premium requested by the private party for the participation in the joint project. For example, sunk costs will include business startup costs, filing fees, costs of overcoming bureaucratic barriers, etc. (corruption costs can also be included, but we ignore them as our goal is to justify PPP even under conditions of ideal and non-corrupt economic management). The premium is a compensation for the potential inconvenience brought by the participation in the joint project, for example, due to internal inefficiencies of the public partner, delays in decision-making and the need to follow the variety of regulations and "the code of best practices". When the project involves funding from the state budget it is often considered to be a high-risk factor in the countries with unstable fulfillment of budgetary commitments. This risk and the associated unformalized costs are also included by the private
entrepreneur in the above-mentioned premium size. An opportunity to participate in alternative projects that are beyond of governmental influence is reflected in the premium and sunk costs, which can be easily influenced by the state as shown below.

Some of the projects that the private sector is reluctant to implement independently can be implemented together with the state by reducing costs and thanks to the comparative advantages enjoyed by the state. It is traditionally believed that the benefits of the private sector are expressed in their specialized knowledge, technological expertise and effective management, etc. Discussions of comparative advantages of the state would be less common. First of all, these are formal and bureaucratic services (checking for compliance with standards, accreditation, approval of project documentation and so on), which are usually included in the cost item under the scenario of a separate project run by the private sector only. Besides these, the public partner may have specialized knowledge that is important to implement a specific project, such as the expertise of the state architectural bodies to implement architectural projects, research and exploratory resources, archival resources and so on.

Thus, the consolidation of resources, based on the principle of relative advantages, reduces the total costs of the project and helps to attract the private partner to implement it, if, for example, the state takes bureaucratic functions upon itself. This makes it possible to implement a number of projects, which would be unfeasible in those cases where the state acts as a "passive client" and the private partner has to address independently the bureaucratic problems and the issues brought by the loss of efficiency. However, the principle of relative advantages does not allow reducing costs incurred due to the asymmetry of information shared by the parties.

**Asymmetry of information**

The volume of resources to be supplied by the parties are regulated by the contractual relations. Under the conditions of absolute informational transparency the contribution of each party is known with certainty, and based on that the compensation can be rewarded to the parties upon the implementation of the project. In this case, the simplest contract will be optimal to run the joint public-private project, which defines the contribution of the state and the contribution of the private business and the amount of material incentives to be paid by the state to the private partner according to implementation stages. Moreover, phased payments are irrelevant, since the contribution of the participants in the joint project is not defined by it and therefore it does not define the result.

The situation changes dramatically under conditions of information asymmetry, when the contribution of one of the parties to the joint project is not reliably known to the other party without having the additional costs of verification (inspection, audit, reporting). Optimal contract uses incentive mechanisms to ensure the maximum fulfillment of the contract terms by each party. The optimal contract between the two parties involved in the process of co-production under one project may be concluded as one of the following contract types [7]:

1. Cost reimbursement contract (hereinafter as CRC); upon the completion of the project (with corresponding costs) the contribution (costs) of the private partner is verified and if the terms of the contract are fulfilled, then the agreed compensation is paid;
2. Result-based compensation contract (hereinafter as RB); the compensation is paid to the private partner in the specified amount if the project is fully completed, if the project has not been fully implemented, the public partner provides evidences on fulfillment of commitments (with corresponding verification costs) and imposes a fine on the private partner, and if it turns out that the contribution of the public partner was insufficient, the public partner will be fined in favor of the private partner;
3. Bonus contract (hereinafter as BC); the verification of contributions made by parties is not conducted, the bonus and a share of profits generated from the exploitation is paid to the private partner after the implementation of the project is over.

In the framework of the bonus contract the private partner may be allowed to operate the created object with the attainment of profits or to receive other benefits from the implementation of the project within the stipulated period of time. This is typical for infrastructure projects implemented under concessions. Alternatively, the state may take commitments to make payments to the private partner within a certain period of time, depending on the effective performance of the created object. For example, if the road section is built as part of the project, the public partner can either allow to use it on a fee basis (charges are paid to the private partner) or takes obligations to pay to the private partner certain amount, depending on the operating conditions of the road (throughput capacity, security conditions, repair needs, etc.). Both cases are in line with the bonus contract.

In this case the order of payments is important: the payment after delivery is preferable to the prepayment as it reduces the danger of unfair behavior of the contract partner. Cost reimbursement payment is optimal if verification costs are low. At that the verification costs cover inspection activities to check either the true contribution of the private partner or the accounting of the public partner, which has to prove the fulfillment of contractual obligations.
In the latter case, the fact of fully completed project and fully fulfilled contractual obligations by the public partner means that contractual obligations have been met by the private partner as well. Penalty sanctions provide an incentive and motivate to fulfill obligations under the contracts that verify information. If the verification costs are high, the optimal contract would be the bonus payment with a share of future revenues to be provided: the participation in future revenues provides incentives to avoid undersupplied resources.

Each of the above-given types of contracts is optimal in the sense that it ensures the implementation of the project and includes the system of checks to prevent misconduct of contract partner. However, as noted above, it is necessary for the project to generate income that exceeds the cutoff threshold so that the private partner decides to take part in the project. Thus, out of the three potentially optimal contracts it is necessary to choose the one that generates maximal profit. If it is above the cutoff threshold, then the project is realizable.

**Project feasibility**

The joint project is characterized by costs, associated with the supply of resources and "manufacturing technologies", which determine the dependence of the result on the contribution of each party. To have formal definition of manufacturing technology it makes sense to define the result of the project as the cumulative social benefits, generated by the project. In this case, even minor undersupply of resources may significantly affect the result. For example, the infrastructure projects may have one object of the agreement such as a bridge, a road section or other structure. Social benefits of the project are determined by the quality of performance, ready time and other details, including the method of construction waste disposal and barriers, created by the construction works. Short supply of resources will not affect the quantity of infrastructure objects to be put into operation (it is one object as it is stipulated in the contract), but it will affect the satisfaction of the consumers. Sensitivity of results to the undersupply of resources plays a key role in the selection of the optimal contract.

The choice between the CB and RB contracts is defined by the cost of verification of information. In this relative information costs per unit of material costs is important, i.e. the ratio of information verification costs to the total costs of the supply of resources. An usage of this indicator reflects the fact that the cost of information verification in the amount of 1 million rubles (reporting and inspection) may be too high for a project, costing 1 billion rubles or it could be quite appropriate for a project, costing 1 billion rubles. The second indicator that measures the project and plays an important role in selecting the optimal contract is the sensitivity of the project to the contribution of each party, which shows how the result will change when the contribution of one of the parties is increasing/decreasing by 1%. By analogy with the analysis made in the work of Roels et al [7], we can formally show that if the cost, associated with the verification of the contribution of the private business is relatively small, it is most advantageous to conclude cost reimbursement contract, i.e. verifying the contribution of the private partner reduces the total cost and if verification costs are high it is more profitable to have result-based contract. If there was no information barrier, then cost reimbursement contract and performance based management contract would be identical: in both cases the contribution of both partners is precisely known and verification costs do not play a role. If the information barrier is present and the verification of information on the contribution both of the private and public partners is associated with the same non-zero costs, then cost reimbursement contract and performance based management contract cease to be equivalent. The choice between them depends on the sensitivity of the results to the contributions to be made by the parties. If the project is more sensitive to the contribution of the private partner, it makes sense to fix the result and to disburse payments only when the result is achieved, which is defined by result-based contract under which the public partner shall prove that it has fulfilled the obligations of the contract, if the result is not achieved. If the project is more sensitive to the contribution of the public partner, the compensation to the private partner should depend only on its own contribution and the corresponding verification shall be conducted as stipulated in the cost reimbursement contract.

Cost reimbursement contract and performance based management contract are the contracts with fixed payments: the amount of compensation is to be defined upon conclusion of the contract. Bonus contract suggests a variable amount of compensation, depending on the social value generated by the project. It is optimal in those cases, when it allows achieving greater social benefits than the most optimal with fixed payment. It can be demonstrated (see [ibid]) that this condition is adhered for projects with approximately equal and relatively low sensitivity to both resources: in these joint ventures it is more profitable to neglect the verification of the contribution of the parties and rely on the incentives, created by the payment terms. Even if one of the parties will supply resources in a smaller volume than it is stipulated by the contract, the project will not suffer much (low sensitivity to the result), but through making savings by skipping verification activities much greater benefits can be achieved than under the contract with verification exercise included.

The above arguments determine the optimality of contracts, depending on the sensitivity of the project to the contribution of public and private partners, as it is schematically presented in Fig. 1. It also reflects a zone of
unfeasible projects for which even the optimal contract fails to provide a profit that would be sufficient to overcome the cutoff threshold. These projects are characterized by a relatively high sensitivity to the contributions to be made by both parties. In this case, it is impossible to neglect the verification, even if the verification costs are high as the sensitivity of the project to even smaller undersupplies is too high, while the verification imposes the costs that prevent to exceed the cutoff threshold.

Under conditions when verification costs to check the contribution of the private partner (information is completely unavailable) are infinitely high, the cost reimbursement contract is suboptimal and similarly this will be true for the verification costs in regards to the contribution of the state and performance based management contract. If the contribution of any of the partners cannot be verified, it is always optimal to apply bonus contract. But even the bonus contract will not help to implement unfeasible projects since it does not influence on the cutoff threshold. Moreover, when concluding the bonus contract the parties may contribute to the less extent than it is guaranteed by cost reimbursement contract and performance based management contract. The reason for this is that cost reimbursement contract and performance based management contract define explicitly the volume of resources to be supplied by each side, while the bonus contract only specifies the shares that the parties receive from the profit, generated by the project and they have the right to decide what is amount of the profit they are ready to accept to be satisfied. Since the implementation of the project, even if it does not provide for the optimal volume, is better than to reject it, such contract, incurring high information costs, provides for "the optimum of the second order" as opposed to "the optimum of the first order" that is achievable under cost reimbursement contract and performance based management contract.

![OPTIMAL CONTRACT SYSTEM](image)

Where: CRC are projects for which it is optimal to apply cost-based compensation;  
PBMC – performance based management contract  
BC - bonus contract  
Unfeasible projects - projects for which cannot attract private contractors under standard contracts due to the fact that the profit level of such projects does not reach the cutoff threshold.

A variety of unfeasible projects (to be potentially feasible through PPP) is characterized by two important properties. First, it decreases with the reduction of the relative verification costs: reduced verification costs increase the profit from project operation and as soon as it exceeds the cutoff threshold the project will turn to be feasible. Verification costs bring losses for the society and the social welfare can be increased by reducing these costs to a minimum. Secondly, the number of unfeasible projects gets reduced with the decrease of cut-off threshold: in this case even the low profit generated by the joint project may be sufficient to attract the private partner and to implement the project. The cutoff threshold can be reduced either by reducing the sunk costs (startup costs to launch a joint venture) or by reducing premium size for participation in the joint project with the state. These two properties of the variety of unfeasible projects help us to explain the role of PPP in terms of improvement of the social welfare.
**Partnership principle**

The partnership principle distinguishes public-private partnerships from consolidated public-private enterprises, where the state and the private sector consolidate their resources to implement the project. According to this, both parties must be interested in the success of the joint project. The system of incentives, provided by the optimal contract, pursues the same goal. Our objective is to define the difference between the partnership and the system of incentives, which would help to answer the question: what is the difference between the "cooperation" and "partnership"?

The system of incentives, provided by contracts, consists of penalties to be imposed on the parties in the case if there will occur deviations from the contract term (under contracts with the verification of the contributions, cost reimbursement contract and performance based management contract) and future benefit-sharing rate (under bonus contract, without verification of the contributions of the parties). The distinction of the partnership principle from the system of incentives is that it relates to incentives and/or constraints that are difficult or are impossible to be provided under contract terms. To some extent, the partnership principle is in tune with the behavioral aspects of the decision making process.

Despite of its apparent irrationality, altruism, justice and gratitude in response find experimental validation in behavioral economics (see Fehr E., Schmidt K.) [11]). The participants of experiments demonstrate willingness to contribute to the success of a completely unknown partner, taking part in the experiment (no acquaintance, friendship or other relationships), thus, going beyond the restrictions imposed by rational arguments. Similarly, the partnership principle relates to the general provisions that go beyond of the specific contract and demonstrates the willingness and ability of the public partner to promote private partners under PPP conditions. We do not state that the contracts of the state with the private business must rely only on the good nature and altruism of the representatives of the public partner; on the contrary, we believe that the framework of the standard relationships, established between the public and private partners, can be expanded to give them more flexibility in addressing issues. That is how we understand the role of the law on PPP.

Here are a few examples. State guarantees can allow the private partner to get funding on the financial market. Provision of explicit guarantees is not possible, unless the state is provided by the legislation to serve as a financial guarantor and the sources of funds to meet the obligations, arising from these guarantees, are defined. However, apart from the explicit guarantees, the cooperation with the government in one project gives an implicit signal to the financial sector. If the state declares the project to have a priority and announces that it will be supported up to its successful completion, the probable success of investing into such project will increase for the financial sector, allowing the private partner to get a loan on more attractive terms. Such position of the state cannot be reflected in the contract between the state and the private partner, but it will have a positive effect on the result. Of course, such notions as "priority" and "support" also require legislative recognition and funding sources shall be defined. We should also mention funding from international financial institutions, which is available only to the state, but produces beneficial effect to all partners involved into PPP.

Guarantees are not the only channel to create benefits for potential PPP participants. In 2000, the UK Treasury together with the private sector has established the enterprise Partnerships UK, being a PPP project itself (51 % of state shares) and aimed at the provision of advisory services to build public-private partnerships. In 2011 the part of the functions of this organization was delegated to the Special Department of the Treasury (Infrastructure UK), and another part to the new PPP (Local Partnerships), providing assistance in organization of PPPs with local authorities. Such assistance in business organization makes PPPs more attractive to the private sector. Similar organizations exist in other countries, such as Denmark, Ireland and the Netherlands, though in a different form.

An additional advantage of PPP could be the information costs reduced through simplified reporting (as compared to the procedures adopted in the public procurement system). Again, such conditions cannot be fixed by the contract concluded by the state and the private business, unless this is authorized by the legislation. Reduction of information costs becomes possible mainly thanks to co-production, when private and public partners conduct parallel and implicit monitoring of each other's performance in the process of co-production. Analysis of public procurement of intellectual services shows that public buyers are involved in co-production to a lesser extent than private companies [12]. The reason for this lies in peculiarities of public procurement, the regulatory procedures of which do not contain incentives for active co-production.

It is logical to expect that the "true partnership" will reduce information costs, including improvement of information exchange within the framework of co-production. Intensive co-production can be expected at consolidated enterprises as well. A distinctive feature of the partnership in regards to information costs is the
opportunity to reduce costs by simplifying and reducing reporting. In addition such partnership helps to reduce the cut-off threshold by providing the benefits to the private sector that are not available when working with the state based on standard contracts. The cutoff threshold depends on sunk costs and premiums. The above examples of agencies, promoting PPPs, demonstrate how the state can influence the sunk costs. At the same time the readiness of the state to provide guarantees (i.e. to take over some risks) and potential reputational benefit, gained by the private partner, can reduce the premium for its participation in the joint project. This is particularly true for large projects, funded with participation of international financial institutions.

Thus, in contrast to the system of incentives, provided by the standard contracts (penalties and premiums) and designed to demotivate participants of the project profit-wise to deviate from the terms of the contract, the partnership principle creates additional benefits for the private sector (thus, reducing the cutoff threshold and increasing the readiness of the private businesses to participate in the project), as well as for society as a whole (previously unfeasible projects get implemented and costs get reduced).

The opportunity to implement projects under PPP is shown in Fig. 2. According to the above considerations, the PPP is organized within the framework of previously discussed co-production contracts. An important addition to them is the partnership principle, which is ensured rather by institutional environment than specific provisions of individual contracts. It cannot be stated that PPP allows to realize all projects, since the degree applied to reduce the participation premium and sunk costs for the private sector may be insufficient to ensure the implementation of some projects. However, any reduction in the cutoff threshold will result in the reduction of many unfeasible projects, thus, improving the social welfare.

*Figure 2*

The possibility to implement projects through PPP

*Public-private partnerships (PPP) are organized in the framework of cost reimbursement contracts (PPP-CRC), performance based management contracts (PPP-PBMC) or bonus contract (PPP-BC) depending on information costs and the project sensitivity to the contributions of the parties.*

Institutional environment

The institutional environment plays an important role in this analysis. It is presented as a possibility in principle to conclude the contracts of three different types between the public and the private partners, as well as by the special law on PPP (if any), supporting organizations and historically developed cultural and business traditions. In this paper the political components of the institutional environment have not been studied in order to evaluate particularly the optimality of the PPP under idealized conditions of rational choice in the absence of political pressure (although Richard Geddes and Benjamin Wagner [8] show that political motives play a role in the adoption of laws on PPP). In this section we show that the conducted analysis does not put restrictions on the system of contracts (and contractual solutions, proposed here, are used in practice), and as a result, the feasibility of PPP depends on more general business conditions.
The system of contracts

Three types of contracts, described above (cost reimbursement contract and performance based management contract and bonus contract) cover most of the contracts, used in practice. The majority of contracts will fix (a) the composition of the parties that enter into the agreement, (b) the obligations of the parties, (c) the compensation of the parties and (d) the responsibility of the parties. All of these elements are presented in the reviewed agreements.

In this case the parties that enter into the agreement are public and private partners. The contracts with larger number of parties can be considered as well, in this case the considerations virtually remain the same since only the sensitivity of the result to the contribution of each party and the necessity of information verification costs will play a role. We can expect that with the participation of larger number of parties the information transparency will decrease and eventually the bonus contract will dominate over the contracts with fixed compensation rates. However, this does not affect the conclusion on the ability of PPP projects to reduce many unfeasible projects. The latter is determined by the total amount of cutoff threshold (for a larger number of partners), which should be covered by the social benefit, gained from the project execution, which declines due to increased information costs. It follows that for complex projects with larger number of partners the area of unfeasible projects will grow as compared to bilateral projects, and therefore there will be increased effect from applying PPP instead of standard contracts (by applying PPP more unfeasible projects can be implemented). This conclusion explains the opinion accepted in the literature that PPPs are used primarily for complex and long-term projects.

The commitments of the parties are presented by their contribution to the project. An important prerequisite for the analysis presented was that the state also made its contribution, thus, bringing the emphasis on the consolidated public-private enterprises. Is it possible to apply the partnership principle to contracts without having resources consolidated? Such projects are equivalent to the joint project with minimal or even zero sensitivity to the contribution of the state. They are located on Figure 1 and Figure 2 along the horizontal axis, and therefore it makes sense to implement these projects through cost reimbursement contracts.

In case if the public side has no contributions made, the expenses of the private partner will be defined by the result to the full extent, so we can talk about the equivalence of cost reimbursement contract and performance based management contract. De facto, in this case we are dealing with the standard supply contract: the payment is disbursed based on the good results delivered that can be equally considered as the contribution of the private partner and the final outcome of the project. These projects are implemented in the framework of the public procurement system. The expansion of the partnership principle to include such projects is sensible only if it can improve social welfare, in other words, if there are many projects that are unfeasible without the partnership principle.

Figures 1 and 2 show only unfeasible projects with visible sensitivity of the results to the contribution of the public partner. In regards to supply contracts it is difficult to speak about "unfeasibility" of such projects as the contribution of the private partner is verified by the fact of the delivery, as such, and verification costs are in fact at zero level. The only thing that can prevent the conclusion of such contracts are high sunk costs and high premium for working with government customers. In this respect, we can expect that some actions of the state can help to reduce these barriers, but one can hardly speak of a "partnership" in the absence of resource consolidation. It should also be noted that according to the principle of relative advantages, an outsourcing is optimal only when the state cannot effectively assist with implementation of the project.

The compensation of parties is presented in this study on contracts in general terms. In practice, this is the part on compensations that demonstrates a discrepancy between the different types of contracts. The generalized approach is convenient because it describes all possible cases (on the basis of verification of the contributions made by the parties: not to verify, to verify the contribution of the private partner, to verify the state contribution; cross-check of both partners does not add incentives but increases the inspection costs, and therefore it is not optimal), serving as a basis to define optimal structure of compensation in combination with penalties (corresponding responsibilities of the parties). Also it is implicitly assumed that the structure of compensation and penalties may be applied as well, in other words, the deviation from the contract will be punished with a probability of 100% , as well as the amount of compensation will be received in full.

Contracts with fixed compensation (cost reimbursement contract and performance based management contract) are common in practice. For example, in the Netherlands they apply PPP contracts with payments made upon the delivery of services (see: CMS PPP Guide'). Examples include the renovation of the building of the Ministry of Finance in Hague, the new buildings constructed for the Penal Institution in Zaanstad, the military museum in Susterberg, Tax Administration in Groningen, the Supreme Court of Netherlands, etc.
Bonus contracts correspond to projects in which the private party holds the right to use the asset within a specified period of time upon completion of the work and to operate it for profit (for example under concession agreement). The example is the construction of highways E75 and E18 in Finland (see [13]), performed on concession terms: the private contractor receives the fixed proportion of payments for using these roads. Similar agreements, used in the United States, are known as BOO contracts “Build-Own-Operate”.

Examples with the construction of buildings and roads are indicative in terms of selection of the optimal contract. The construction of the building is a localized project, which requires to consider specific customer requirements with high degree of co-production at every stage, and even the frequent presence of the representatives of the customer at the object. Roads are standardized to the greater extent and every kilometer of the road applies the same standard construction methods, moreover, the physical presence of the customer is often impossible due to the length or remoteness of the roads. Unit costs of building construction are higher than the unit costs of road construction (for example, in terms of the construction area), while information costs, associated with road construction are higher due to co-production and on-site presence. As a result, the relative information costs (material costs per unit) of the building construction are lower. The above analysis predicts the optimality of the contract with a fixed fee (and due to high sensitivity of the project to the contribution of the private partner, there must be applied the result-based contract), while for the construction of roads it is more optimal to apply bonus contract, which corresponds to the concession.

Special conditions for PPP?

What should be the law on PPP about? The need for such law arises when the prevailing conditions for doing business (the system of supporting organizations and business traditions) do not provide sufficient benefits for the private sector to work together with the government to overcome the cutoff threshold, so the part of the projects could not be implemented. Thus, the law should create special conditions for PPP functioning.

Lowering the cutoff threshold can be achieved in two ways: by reducing sunk costs and by decreasing premiums for participation in the project. The first depends on how easy it is to start a joint business with the state, and the second depends on reputational and other benefits, gained from joint operation. The burden of starting-up the business can be facilitated by the supportive organizations, such as agencies on promotion of infrastructure (or other social) projects. Such agency could take on advisory functions to simplify the participation of the private sector in the projects of the state. Reduction of the premiums for participation in governmental projects requires a clear legislative registration of obligations that can be taken over by the public body, involved in PPP. Lack of clarity and certainty in this issue adds some difference to the final result in terms of the participation of the private sector in the state project, and as a consequence, the private business would prefer a joint project with other private businesses whose obligations are clearer.

The same applies to penalties to be imposed on the government as one of the sides of equal project (that is how the partnership is often considered). Until practices in doing business establish and secure unconditional reputation of the state as an absolutely reliable partner, such conditions are needed to reduce the risks of (explicit or perceived) of private sector’s involvement in public projects.

In addition to reducing the sensitivity level, the law (in the absence of other elements of the institutional environment that can address these issues) should regulate the informational component of the public-private relations in one project. This applies to simplification of the interaction between the public and private partners, the intensification of co-production and improvement of the exchange of information. The law should provide incentives for this and guarantee the possibility to apply simplified procedures. Supporting organizations may and should play their role in this. Examples and the analysis of the functions of such organizations are listed, for example, in the work of Stadler L., Probst G. [14], reviewing the work of brokers, involved into search for PPP partners. In particular, the authors show that in parallel with the search for the "best fit", brokers also act as an intermediary to facilitate communication and some sort of translators from public to private, adjusting discrepancies and helping future partners to get to know and to understand each other.

The fact itself that the project is referred to the category of PPP should be a "quality signal" for private businesses. This does not mean, however, that the state should create favorable terms and to step away from performance criteria, laid down in the legislation on public procurement. The proposed analysis contains no opposition to (potential) legislation on PPP and public procurement legislation. In contrast, the PPP can be performed under the same contracts, which are used for procurement. The selection of PPP partner can be and should be made on the basis of competition principles, applied to the selection of a supplier under public procurement procedures. Rejection of the principle of competitive selection leads to a negative effect: while comparing the PPP in the U.S.

10
and the UK [15], the researchers indicated that many PPPs in the United States were concluded by circumventing competitive procedures and have become a mechanism to transform investment risks from the private sector to the public partner. Bloomfield P. [16] analyzes the international experience in PPP implementation and shows that despite the fact that the exemption of PPP from the rules of competitive selection is often motivated by "innovative and efficient approach and manifestation of confidence to the private partner by the state", it becomes apparent that the contracts are awarded to the companies "with connections", which ultimately leads to unnecessarily high costs for project implementation and increases the risk of reduced performance quality. The problem here also lies in the fact that the optimal contracts that we determined, involve good faith specification for responsibilities of the parties, while under non-competitive selection there are increased risks to weaken contractual requirements in favor of the private party.

Thus, the simplification discussed above, relates, first of all, to administrative and bureaucratic efficiency, rather than to economic issues. Provisions of the legislation on public procurement, particularly of UNCITRAL Model Law [17] are aimed at improving economic efficiency; and the principle of competitive selection is one of the mechanisms for achieving this. Without going into a detailed analysis of this legislation, which goes beyond the scope of this article, it should be noted that the law on PPP should be consistent with and complementary to the legislation on public procurement, and shall not substitute its provisions. If the provisions of the Law on PPP do not provide for cost-effectiveness, they should be changed in the law on the public procurement. Deviations from them, by its definition, cannot increase economic efficiency and social welfare, as it contradicts the idea of PPP as such.

In the global expert community there is no consensus on whether it is necessary to have the law on public-private partnership or not, as well as there is no consensus on whether PPPs are beneficial to the society. In Russia, experts and lawmakers believe that it is necessary to adopt such law, but there is no common understanding developed in terms of what exactly should be regulated by this law. This is evidenced by long time taken to revise federal law on PPP before the second reading, as well as by a variety of expert opinions, expressed during the discussion of the bill at the parliamentary hearings, in particular, about the introduction of additional eleven forms of PPP to the bill, which previously did not appear in the law. Adding the regulation of new PPP forms clearly show that it is not about expanding the scope of the law, but it is about changing the subject of regulation - if originally the law on PPP was developed as a framework law and it prescribed general principles of public-private relations under PPP, the new version of the bill plans to specify and fix possible forms of PPP. In this article an attempt is made to understand what is a cause that brings such a difference in opinions both among professional and academic communities. From our perspective, the PPP is explicitly beneficial to the society, because it allows to implement projects that are not feasible in the framework of standard contracts. However, the advantages of PPP are based on the peculiarities of the institutional environment; therefore the concept of PPP cannot be limited to the scope of any particular type of contract.

In particular this explains why in the literature the term "legislation allowing for the PPP projects" is more often used instead of the term "the law on PPP". The law on public procurement and the law on concessions are also under the same category of the legislation. Does the system of these laws provide a space for a separate law on PPP? From our point of view, the space is available but not always. The law on PPP should develop institutional environment that embodies the principle of partnership. In this case, the PPP grows to become strong, allowing to implement projects that previously were unfeasible. If the institutional environment is well developed, there would be no special need to have separate law on PPP.

The analysis of works, devoted to PPP advantages and disadvantages, shows that disadvantages are associated most often with the institutional environment. The analysis of the effectiveness of laws on PPPs in countries with economies in transition has shown the same conclusions [10]. The laws adopted in the United States at the state level (mainly in respect of PPP in transport infrastructure system), also make an emphasis on the institutional environment: laws determine how to proceed with initiative offers, whether to allow the participation of private parties in the future profit sharing under the project, whether to move PPP out of the law on public procurement, whether to grant tax exemptions, whether to allow the parties to get involved in competing projects, whether to introduce any restrictions on the public contribution to the project, whether PPP should be approved by local authority, etc. (see [8]). In terms used by this article some of these provisions regulate the set of available contracts (profit sharing, the federal/state contribution), and some of them regulate the cutoff threshold (benefits, elimination of uncertainty). While the restrictions on the types of used contracts may damage economic efficiency, the management of cutoff threshold is consistent with the conclusion on the need to create advantages for PPP over other forms of public-private cooperation.

References

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4. Full list of 34 countries with the degree of compliance: the best compliance with international standards was noted in Mongolia; the high level of compliance - Albania, Bulgaria, Croatia, Egypt, Estonia, Hungary, Latvia, Lithuania, Moldova, Montenegro, Russian Federation, Serbia, Slovakia, Slovenia, Tunisia, Ukraine; the average compliance - Bosnia and Herzegovina, Czech Republic, Jordan, Macedonia, Morocco, Poland, Kazakhstan, Kyrgyzstan, Romania, Turkey; low compliance - Armenia, Azerbaijan, Belarus, Georgia, Tajikistan, Turkmenistan, Uzbekistan.
5. Very high efficiency has not been observed anywhere, high level was noted only in Albania and Mongolia, as to the other countries it showed the average and below average levels.
6. This approach does not take into account the synergy effect, when co-production provides a new resource that is inaccessible to the parties under separate mode. It is assumed that synergy benefits do not exceed the cost savings, associated with the supply of resources.
7. «PPPs recognize that both parties have certain advantages relative to the other in the performance of specific tasks. By allowing each sector to do what it does best, public services infrastructure can be provided in the most economically efficient manner.» (European Union 2003. Commission Guidelines for Successful Public-Private Partnerships. Brussels.) Ibid, it is cited: «The overall aim of PPPs is therefore to structure the relationship between the parties, so that risks are borne by those best able to control them and increased value is achieved through the exploitation of private sector skills and competencies.» That is the aim of the present article, which is to understand what does the structuring consists of.
8. Theoretically, the contribution of resources, which have no comparative advantages, should be reduced to zero, but we cannot exclude that complete rejection of them would be impossible. For example, one of the parties has specialization in shipping operations and can provide logistics services at a lower price, complete rejection of the second party to use the transport and to process shipment even of a minimal volume will entail increased
coordination costs and ineffectiveness. Therefore, it may be more advantageous to reserve the transportation function for the second side in a minimum volume, for example, transportation of its experts to the site. Outsourcing, which is based on the principle of comparative advantages, is exclusively relevant to the contribution of the parties to the joint indivisible project. If the project can be carried out by stages, and the action results of one of the parties is a completed "subproject" by the time when the other party starts project operations, the minimization of costs imposes a "division" of complex projects into separately operated components which has been already noted in the introduction. In the general case the minimization of costs by itself does not assume the divisibility of the project. Distribution of tasks, based on the principle of comparative advantages relates primarily to projects, designed to have simultaneous contribution made by both parties.

It is considered that the cutoff threshold for the state has been exceeded, if the project implementation improves the social welfare.

9 There are popular terms in English literature, for example, the terms such as compliance cost (costs incurred to bring compliance with the formal legal requirements) and red tape (the set of bureaucratic procedures associated with the implementation of the project, derived from the "red tape" that fixes a bunch of required documents). Bureaucratic services, introduced by us, are associated with these concepts and put emphasis on the fact that the authorities have the specialized knowledge in terms of bringing the project in compliance with the formal requirements.

10 In the paper of Besley and Gatak [3] the focus is made on human capital (knowledge). Mahallilingam and others[19] show that the administrative experience and skills, especially in the structuring of the project and submission of applications for the competition, are integral to the success of the enterprise.

11 In the paper of Roels and others ([22]) a fundamentally different context is considered: they consider the cases in which verification is possible in regards to the contribution of one or another partner, or none of them. The logic of our reasoning is different: if only three types of contracts are optimal, then which of them should be selected by the parties if they are free to choose and which of the partners should (or should not) report on its contribution to the project or to be subject to verification. Implicitly, we assume that information about any of the partners can be obtained and verified (for example, through judicial and investigative procedures, unless otherwise unavailable), but then it would be the question of the costs.

12 Richard Foster, the founder of Foster Infrastructure, Australian company that assists in PPP organization and operation, in his comments on our work have indicated that, in particular, in Australia the state enjoys such unquestioned authority to fulfill its obligations, that no laws are needed to create additional safeguards and, virtually, any work of private business with the state is the PPP. The reputation of the state in this case refers to what we call the established traditions. Besides them in Australia there are such institutions as Partnerships Victoria and Infrastructure Australia at the state level, as well as private consulting companies as Foster Infrastructure, which we refer to as supporting organizations.

1. Introduction

Electronic procurement (E-procurement), which uses electronic communication in procurement process, has been hailed as an “effective tool for instituting procurement reforms and establishing a fully transparent and open procurement environment.” [1] However, following challenges are also mentioned in the report of the UN Expert Group Meeting.

“a) Lack of awareness and capacity building programs:
   • Lack of government policies and legal framework (e-GP is not just ICT).
   • Lack of institutional capacity for public procurement.

b) Resistance to change: Procuring agencies’ reluctance to convert to e-procurement.

c) IT infrastructure and Internet readiness:
   • IT infrastructure for e-commerce not mature in many developing countries.
   • IT divide in different regions within country.

d) Lack of cross-governmental coordination.
   • Difficulties in legislation.
   • Multiple platforms.

 e) Ineffective implementation.
   • Improper Business Process Re-engineering (BPR).
   • Digitalization without procurement reform.
   • Technology can complicate rather than simplify procedures.
f) Obstacles for cross-border e-procurement: Electronic signature are recognized only domestically”

From the above list, many elements are found to be related with law. For example, a) and d) clearly indicates the legal aspects of e-procurement. It is evident that e-tendering or e-payment should be well integrated or coordinated to general public procurement law in each state. Framework agreement, which is mostly conducted through e-procurement and needs close cooperation between procuring agency and customer agency, requires agency coordination through law. On top of that, c) and f) is also related with legal matters, because e-signature and e-document, which are crucial IT infrastructures, need legal foundation. This shows that sound legal framework is indispensable to address these challenges.

Despite the importance of legal aspects of e-procurement, only a limited number of legal researches can be found. Comparative researches conducted during the revision of UNCITRAL Model law can be mentioned as typical legal research on e-procurement. [2-5] In these literatures, issues such as record-keeping of communications, preserving the security of electronic tenders, and potential discriminatory impact of e-procurement are discussed. Researches on ‘framework agreement”[6-10] or ‘electronic reverse auction” can also be counted as legal ones. [11-13] In these literatures, issues such as guaranteeing competition in framework agreement and use of non-price factor in electronic reverse auctions are discussed.

However, there remain some legal issues which need more discussion and clarification. First, what’s the desirable legal framework for e-procurement? There can be three models of e-procurement legislation framework according to the relationship between e-procurement and general procurement law or e-commerce law: 1) diffusion model, 2) incorporation model, and 3) integration model. What are the strengths and weaknesses of these models?

Second, the relationship between e-procurement and tendering or award mechanism in general procurement law should be more clarified. For example, is there any relationship between the level of facilitation of e-procurement and level of procurement officer’s discretion in tendering or award mechanism? Is there any specific type of tendering or award which is more adaptive to e-procurement system?

Third, what’s the desirable relationship between law and technology in e-procurement? World Bank indicates three models on relationship e-procurement related technology and law: 1) minimalist approach, 2) technology specific approach, and 3) two-tiered approach. [14] What are the merits and shortening of these models? Which model most facilitates the e-procurement?

Fourth, legal mechanism on coordination among different agencies in implementing e-procurement should be clarified. For example, use of framework agreement or IDIQ contract, and integration of e-procurement and e-budgeting system need this kind of coordination. How can this coordination be facilitated through law?

This paper aims to approach these issues from comparative law perspective. This paper will compare four jurisdictions: United Nations Commission on International Trade Law (UNCITRAL), European Union (EU), United States (US) and Republic of Korea (Korea). UNCITRAL enacted Model Law on Procurement which includes many e-procurement provisions. As this Model Law was prepared for the harmonization of each state’s legislation, this Model Law can give many lessons on e-procurement legislation worldwide. European Union is also making many efforts of harmonizing member state’s e-procurement legislation through Directives on procurement, and United States manages many e-procurement related legislations both at federal and state levels. As both EU and US retain one of the largest procurement markets in the world, it will be very useful to see e-procurement legislation in these jurisdictions. On the other hand, Korea is evaluated as one of the leaders in e-procurement system [1] and new legislation on e-procurement has taken effect recently in 2013. Although there
are some researches on Korean cases [15-16], legal aspect of Korean e-procurement system has not been dealt in
details. After comparing these four jurisdictions, this paper will suggest some modest answers to four main
issues mentioned above.

2. UNCITRAL

In 1994, the United Nations Commission on International Trade Law (UNCITRAL) adopted a Model Law
on Procurement of Goods, Construction and Services, and accompanying Guide to Enactment. The motivation
of this Model Law enactment was to address inadequate or outdated procurement legislation in many countries.
In 2004, UNCITRAL decided to update the 1994 Model Law to reflect new practice, in particular the use of
electronic public procurement. As a result, updated Model Law was enacted in 2011. [17]

In the accompanying Guide to 2011 Model Law, the term “e-procurement” is used to mean the
procurement of goods, works, and services through internet-based information technologies (IT). (UNCITRAL
2011, p. 8) After indicating the benefits of e-procurement, such as enhancing transparency, administrative
efficiency and allowing a more strategic approach to procurement, UNCITRAL mentions following three
considerations in implementation and use of e-procurement in the Model Law.

“First, given the potential benefits of e-procurement, and subject to appropriate safeguards, the Model
Law facilitates and where appropriate and to the extent possible, encourages its introduction and use.
Secondly, as a consequence of rapid technological advance and of the divergent level of technological
sophistication in States, the Model Law is technologically neutral (i.e. it is not based on any particular
technology). Thirdly, detailed guidance is needed to support enacting States in introducing and operation
an e-procurement system effectively.” [17]

With these considerations in mind, the Model Law provides Article 5 (publication of legal text) and 6
(information on possible forthcoming procurement), Article 7 (communications in procurement), Article 40
(presentation of tenders), Chapter VI (electronic reverse auction), and Chapter VII (framework agreement
procedures).

As regards communications in procurement (article 7), UNCITRAL’s main objective is “to seek to
courage the participation of suppliers and contractors in procurement proceedings, without obstructing the
evolution of technology and processes.” In this context, article 7 of the Model Law does not require the use of
any particular technology. Article 7 Paragraph 5 provides that “the procuring entity shall put in place
appropriate measures to secure the authenticity, integrity and confidentiality of information concerned.” The
guidance to the Model Law emphasizes that consideration should be given both to the efficacy and any possible
discriminatory or anti-competitive effect, including in the cross-border context in designing the securing the
authenticity, integrity and confidentiality. [17] This shows that the Model Law focuses more on enhancing
competition in the cross-border context.

According to Article 40 Paragraph 2, a tender shall be presented in writing either in paper form or any
other form. In the non-paper based form, a tender shall ensure at least a similar degree of authenticity, security,
integrity and confidentiality. This reflects why UNCITRAL adopted so-called “functional equivalent” approach.
[17]

As effective implementation and use of e-procurement depends on the availability of necessary e-
commerce infrastructure, each State can refer to the UNCITRAL’s e-commerce texts: the Model Law on
Electronic Commerce (1996), the Model Law on Electronic Signatures (2001), and the United Nations
Chapter VI of the Model Law provides electronic reverse auction (ERA). ERA is an online, real-time purchasing technique utilized by a procuring entity to select the successful submission. The ERAs have been facilitated by the communication technologies by permitting the anonymity of the bidders to be preserved as the ERAs take place virtually. In this context, the Model Law allows only online reverse auctions with automatic evaluation processes. [17]

3. European Union

Despite many benefits of e-procurement, the recent Communication of European Commission recognizes that the EU is lagging behind both its own targets and internationally. Across the EU, e-procurement is still used in only 5-10% of procurement process. [18] There are over 240 electronic platforms or portals in the EU for public procurement, but only about 50% of them are capable of receiving electronic bids. Only two thirds of the EU Member States are operating such systems. [19]

A number of barriers are hampering the transition towards full e-procurement. The difficulty to persuade hesitant purchasers and suppliers to change their habits and market fragmentation that can emerge from the existence of a wide variety of systems are mentioned as such barriers. To overcome these barriers, creating an effect legal framework is emphasized. [18]


As part of the legislative package of Procurement Packages, 2004/18/EC and 2004/17/EC, the European Commission adopted Communication which proposes an “Action Plan for the implementation of the new legal framework for electronic public procurement”. The objectives of this Communication are 1) to ensure a well functioning Internal Market when public procurement is conducted electronically, 2) to achieve greater efficiency in procurement and improve governance, and 3) to work towards an international framework for electronic procurement. [21] Following table show the current progress made by the individual member states in specific areas of e-procurement.
<table>
<thead>
<tr>
<th>Member State</th>
<th>Has a national strategy</th>
<th>E-submission Capability</th>
<th>Key developments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>Yes</td>
<td>Yes</td>
<td>As from July 1, 2013 all federal authorities are required to accept bids submitted electronically.</td>
</tr>
<tr>
<td>Belgium</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Bulgaria</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cyprus</td>
<td>Yes</td>
<td>Yes</td>
<td>Mandatory from July 2012 for national procurement below the threshold</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>Yes</td>
<td>Yes</td>
<td>Mandatory from April 1, 2012 for procurement contracts below threshold</td>
</tr>
<tr>
<td>Denmark</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Estonia</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>No</td>
<td>Yes</td>
<td>As from January 1, 2012, contracting authorities are required to accept electronic bids or candidatures for all contracts for EUR 90,000 or more</td>
</tr>
<tr>
<td>Hungary</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Ireland</td>
<td>Yes</td>
<td>Yes</td>
<td>Piloting e-invoicing</td>
</tr>
<tr>
<td>Italy</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Lithuania</td>
<td>Yes</td>
<td>Yes</td>
<td>E-procurement mandatory since 2009</td>
</tr>
<tr>
<td>Malta</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Poland</td>
<td>Being Developed</td>
<td></td>
<td>A new system is being rolled out to all public departments, entities for goods. Gradual integration of services and eventually works.</td>
</tr>
<tr>
<td>Portugal</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Romania</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Slovakia</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td>NA</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Sweden</td>
<td>Yes</td>
<td>Yes</td>
<td>E-ordering and e-invoicing are compulsory for government agencies.</td>
</tr>
<tr>
<td>UK</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

The enhance security safeguards for e-communication mechanism are referred to in Recital 37 of Classic Directive as follows.


Although the above Recital requires enhanced security safeguards for e-procurement, it does not give any reasons for that. The reason is presumed to be related to “the requirement for higher probity standards in are regulated environment and/or for ensuring confidence to bid on the part of firms from Member States.” However, even this reason is criticized considering the e-commerce Directive encompasses all level of e-commerce. [3]

After public consultation with stakeholders and impact assessment of existing Directives, the European
Commission published proposal for a new Directives in 2011 and it was approved by the European Parliament on January 15, 2014. The new Directives aim on 1) simplification and flexibilisation of procurement procedures, 2) strategic use of public procurement in response to new challenges, 3) better access to the market for SMEs and Start-Ups, 4) sound procedure, and 5) good governance. [20]

To fulfill “simplification and flexibilisation of procurement procedures,” many provisions which facilitate e-procurement were revised and added. Chapter II provides techniques and instruments for electronic procurement such as framework agreements (Article 31), dynamic purchasing systems (Article 32), electronic auctions (Article 33), electronic catalogues (Article 34) and centralized purchasing activities and central purchasing bodies (Article 35). Article 51 (electronic availability of procurement documents) and Article 58 (online repository of certificates: e-Certis) can be also mentioned as e-procurement related provisions.

Following table shows how each tendering procedure used and how each e-procurement technique is used as proportion of each tendering procedure during the year 2006-2010.

[Table 2] The relationship between e-procurement technique and tendering procedure [22]

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Number</th>
<th>Framework Agreement</th>
<th>Dynamic Purchasing System</th>
<th>E-Auction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>73</td>
<td>11</td>
<td>1.2</td>
<td>0.6</td>
</tr>
<tr>
<td>Restricted</td>
<td>9</td>
<td>14</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>Negotiated</td>
<td>8</td>
<td>19</td>
<td>1.5</td>
<td>1.1</td>
</tr>
<tr>
<td>Negotiated without publication</td>
<td>7</td>
<td>5</td>
<td>0.3</td>
<td>0.1</td>
</tr>
<tr>
<td>Accelerated Restricted</td>
<td>1</td>
<td>6</td>
<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td>Accelerated Negotiated</td>
<td>0.6</td>
<td>7</td>
<td>0.9</td>
<td>0.2</td>
</tr>
<tr>
<td>Dialogue</td>
<td>0.4</td>
<td>11</td>
<td>0.8</td>
<td>0.1</td>
</tr>
</tbody>
</table>

From the above Table, it is evident that open procedure is the most commonly used procedure. However, for framework agreement, which is the most widely used e-procurement technique, the negotiated procedure and restricted procedures are used more frequently than the open procedures. Dynamic purchasing system and e-auction, which are less frequently used than framework agreement, are also actively implement in combination of negotiation. But the use of dynamic purchasing and e-procurement is also strongly correlated with the open procedure. [22]

It is noticeable that new Directive emphasizes the strong relationship between e-procurement and centralized procurement.

“Electronic means of communication are particularly well suited to support centralized purchasing practices and tools because of the possibility they offer to re-use and automatically process data and to minimize information and transaction costs. The use of such electronic means of communication should therefore, as a first step, be rendered compulsory for central purchasing bodies, while also facilitating converging practices across the Union. This should be followed by a general obligation to use electronic means of communication in all procurement procedures after a transition period of time.” [20]

This indicates implementation of e-procurement is not only a technical matter but also an organizational
or systematic one of procurement. Following trend shows that the share of contract notices published by central purchasing bodies (contracting authorities buying on behalf of other authorities) is rising with the increase of e-procurement.

[Table 3] The share of contracting notices published by central purchasing bodies in EU [19]

<table>
<thead>
<tr>
<th>Year</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Notice (%)</td>
<td>3.14</td>
<td>4.65</td>
<td>5.33</td>
<td>5.44</td>
<td>5.54</td>
<td>5.73</td>
</tr>
</tbody>
</table>

In 2013, the European Commission adopted Communication on end-to-end e-procurement. In his Communication, “end-to-end e-procurement” is defined as “the use of electronic communications and transaction processing by public sector organizations when buying supplies and services or tendering public works, from notification to payment.” End-to-end e-procurement is emphasized as a mean to modernize public administration and to increase SMEs participation in public procurement. [23]

The European Commission also proposed a Directive on e-invoicing in public procurement. E-invoicing is defined as “an electronic part of an efficient financial supply chain and it links the internal processes of enterprises to their payment systems.” It is the core element of a procurement process once a contract has been awarded and “its creation is a prerequisite for the supplier to receive payment for supplied goods or services.” [24]

4. United States

The federal government of United States (US) began implementing electronic commerce from the time President Clinton issued his memorandum in 1993 mandating the use of Electronic Data Interchange (EDI) and electronic commerce. The first motivator for e-procurement was Federal Acquisition Streamlining Act (FASA) in 1994. FASA offered federal agencies the potential to realize cost savings by incentivizing businesses to utilize EDI. Federal Acquisition Reform Act (FARA) further encouraged the development and use of e-procurement. [25]

Along with OFPP Act, E-Government Act and Electronic Signatures in Global and National Commerce Act (E-Sign Act) can be also applied to e-procurement. Especially, E-Sign Act, which regularized electronic signatures and electronic records across the US economy, is evaluated as a key legal milestone for e-procurement. However, it is criticized that exemption e-procurement from E-Sign Act is allowed (Section 104 of E-Sign Act affords federal and state entities the right to set their own standards for electronic records). [5]

Based on these Statutes, Federal Acquisition Regulation (FAR) stipulates e-procurement in more detail. Electronic Commerce is defined as “electronic techniques for accomplishing business transactions including electronic mail or messaging, World Wide Web technology, electronic bulletin boards, purchasing cards, electronic funds transfer, and electronic data interchange.” And other e-procurement related terms such as “Electronic data Exchange (EDI)” and “Electronic Funds Transfer (EFT)” are also defined. (FAR Subpart 2.1)

FAR Subpart 4.5 regulates electronic commerce in contracting. According to this Subpart, agencies may exercise broad discretion in selecting the hardware and software that will be used in concluding electronic commerce. However, the Head of each agency, after consulting with the Administrator of OFPP, shall ensure that systems, technologies, procedures, and processes used by the agency to conduct electronic commerce 1) are
implemented uniformly throughout the agency, 2) are implemented only after considering the full or partial use of existing infrastructure, 3) facilitate access to government opportunities by SMEs, 4) include a single means of providing widespread public notice of acquisition opportunities through the Government-wide Point of Entry (GPE), and 5) comply with nationally and internationally recognized standards. (FAR 4.502)

FAR Subpart 8.4 regulates Federal Supply Schedule (FSS). FSS program is directed managed by General Services Administration (GSA) and provides federal agencies with a simplified process for obtaining commercial supplies and services at prices associated with volume buying. GSA developed an on-line procurement system called “GSA Advantage!”. With this portal, GSA offers an online shopping service. This portal also enables ordering activities to search specific information (i.e. national stock number, part number, common name), review delivery options, place orders directly with Schedule contractors and pay for orders using the Government-wide commercial purchase card. E-Buy is GSA’s electronic Request for Quotation (RFQ) system, is a part of a suite of on-line tools which complement GSA Advantage!. (FAR 8.402)

As regards Multiple Award Schedule (MAS) system, a part of FSS, the panel recommends about the issue on relationship between contract type and MAS as follows. This shows that more flexible contracting types are needed in MAS contracting.

“As while the Panel recommends below that MAS contracts for solutions be awarded on a firm-fixed-price basis using a performance based statement of work, the Panel acknowledged that future agency needs and/or market conditions may make a cost-reimbursement contract an appropriate vehicle.” [26]

US Federal Government’s Major Online acquisition system include Acquisition Central, Electronic Subcontracting Reporting System (eSRS), Federal Business Opportunities (FedBizOpps), Federal Funding Accountability and Transparency Act (FFATA) Portal, Federal Procurement Data System – Next Generation (FPDS-NG), Federal Awardee Performance and Integrity Information System (FAPIIS), FFATA Sub-Award Reporting System (FSRS), Interagency Contract Directory (ICD), Past Performance Information Retrieval System (PPIRS), System for Award Management (SAM), USAspending.gov, and Wage Determinations On-line (WDOL). [27] Some agencies also manage their own e-procurement system. GSA Advantage! is a typical example.

Much of the information transferred electronically in US is unencrypted and is exchanged through open websites such as FedBizOpps. And US policymakers favor technology neutrality, therefore US system are not bound to any particular technical solution. [28] There are controversies on this technology neutrality. Some argue this technology neutrality will facilitate the growth of new digital technologies. Others contend this creates significant risks and burdens. [5]

Some issues are raised in regard to US federal e-procurement system. First, questions have been raised regarding the accuracy, completeness, and timeliness of the contract award data available from FPDS and its successor FPDS-NG. To remedy these problems the OFPP issued guidance, which provides instructions for calculating and reporting the accuracy and completeness of data submitted to FPDS-NG. [27]

Second, separate logins, overlapping data, the absence of a single, uniform level of service, and multiple vendor hosting system is prompting the development of an integrated system. SAM is being developed to integrate eight procurement website: Central Contractor Registration, eSRS, Excluded Parties List System, FedBizOpps, FPDS-NG, Online Representation and CERTIFICATION Application, PPIRS, and WDOL. [27]

Third, efforts are being made to making procurement documents, including contracts, available to the public. For example, during the 113th Congress, a bill was introduced that, if enacted, would require executive branch agencies to make public records available on the Internet at no charge. [Section 7(a)(1)(A) of S. 549 (113th Congress)] [27]
Fourth, some individual agency’s e-procurement system needs improvements. For example, after reviewing the GSA Advantage!, the Government Accountability Office (GAO) identified four arrears that require management attention as follows.

“First, Advantage needs an effective management structure with the sufficient authority necessary to ensure it reaches its full sales potential and other goals for continued success. Second, system specific performance measures to guide the selection and prioritization of new system requirements for Advantage are needed. Third, improvements in processes for uploading vendor product data are needed to address concerns raised by vendors and to improve the overall efficiency of Advantage. Finally, a more thorough analysis of the costs and benefits for virtual stores being offered with Advantage is needed to identify lessons learned and best practices for marketing the system.” [29]

At the state level, eMaryland Marketplace is one of the prominent state government e-procurement systems. It provides tools for posting procurement opportunities receiving bids, and making purchases. This system is also evaluated to increase buying powers through intergovernmental cooperative procurement and heightens competition across a wider spectrum of suppliers. [30]

The challenge for state and local government e-procurement in US is mentioned as follows.

“The challenge for state and local governments is to shift from traditional procurement as a paper-based process characterized by fragmented procurement, off-contract buying, and lack of control over expenditure. Another challenge for state and local governments is to avoid focusing first on the technology needed for e-commerce, as opposed to addressing public policy and organizational issues.” [30]

5. Republic of Korea

Since the 1990s, digitalized procurement administration has been viewed as one of the most important agendas in the reform of the public sector. In order to improve efficiency and transparency through digitalization of procurement administration as part of public reform, the Korean government implemented the Procurement Electronic Data Interchange (EDI) system in 1999, e-Bidding system in 2000, and e-Payment system in 2001. In 2002, it established a comprehensive national e-Procurement system called “Korea On-Line E-Procurement System (KONEPS)”, as one of 11 key projects for e-Government. [31]

To support the implementation of KONEPS, related regulations were revised including “Presidential Decree of Act on the Contracts in which the State is the Party”, “Presidential Decree of Act on Government Procurement”, and “Presidential Decree of Local Finance Act.” Based on these regulations, the Public Procurement Service of Korea (PPS), the centralized procurement agency of Korea, took the role of management of KONEPS. “Presidential Decree of Act on Government Procurement” provides the foundation of Multiple Award Schedule (MAS) system, which was modified based on the framework agreement in EU and IDIQ contract in US. “Act on the E-Document” and “Act on the E-Signature” is also applied to e-procurement which is conducted through KONEPS.

With the introduction of KONEPS, transparency and efficiency of public procurement was enhanced tremendously. KONEPS processes the entire procurement procedures online, from tender notice, awarding, and contracting through to payment. Thanks to the data exchange linkage with the G4C system of the Ministry of Public Administration and Security (MOPAS), KONEPS eliminated the need for the submission of paper documents such as business registration certificates and tax payment certificates. Through the linkage with industry associations, KONEPS also automatically collects information on the bidder for qualification assessment, and subsequently rendering paper submissions obsolete. It digitalized 166 document forms for
electronic processing, including bid, contract, inspection request, and payment request. Most of the documents previously submitted personally or via postal services came to be submitted via the internet. [31]

The following data shows that KONEPS is actively implemented in Korea. Almost two thirds of total national procurement (this include procurement by central government, sub-central government and public enterprises) is conducted through KONEPS. Other one third of procurement are also mostly conducted though other e-procurement system which was established by each agency (Department of Defense, and Public enterprises such as K-Water).

[Table 4] The Currents of KONEPS [32]

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Amount of Procurement nationally (KRW 100 Million)</td>
<td>122,284,642</td>
<td>104,399,702</td>
<td>99,849,393</td>
<td>106,359,781</td>
</tr>
<tr>
<td>Total Transaction through KONEPS (KRW 100 Million)</td>
<td>857,615</td>
<td>751,258</td>
<td>638,485</td>
<td>667,367</td>
</tr>
<tr>
<td>Number of public agencies which used tender notice through KONEPS</td>
<td>13,381</td>
<td>15,298</td>
<td>16,022</td>
<td>15,806</td>
</tr>
<tr>
<td>Number of tender notices through KONEPS</td>
<td>353,551</td>
<td>357,744</td>
<td>402,435</td>
<td>410,929</td>
</tr>
<tr>
<td>Number of e-tendering through KONEPS</td>
<td>23,5176</td>
<td>248,417</td>
<td>288,533</td>
<td>292,195</td>
</tr>
<tr>
<td>Number of vendors who participated in e-tendering through KONEPS</td>
<td>23,239,324</td>
<td>20,843,606</td>
<td>21,888,275</td>
<td>23,952,849</td>
</tr>
</tbody>
</table>

Following Table shows the contracting method which was used by PPS. This table shows the restricted competition is a mainly used method, and open competition is second widely used one. The reason for frequent use of restricted procedure can be explained that this contracting method is used as a tool for strengthening SMEs. (Competition among SMEs) All four contracting methods can either combined with “lowest tender” or “economically most advantage tender.” When “economically most advantage tender” is used, price negotiation is allowed between procuring agencies and vendors. (Presidential Decree of Act on Government Procurement Article 43) MAS, which is conducted through KONPES, is usually combines open competition or restricted competition with negotiation procedure based economically most advantage tender.
[Table 5] Contracting Method used of KONEPS [32]

Unit: KRW 100 Million

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Competition</td>
<td>121,221(27.1)</td>
<td>97,664(25.4)</td>
<td>93,229(27.4)</td>
<td>98,325(28.1)</td>
</tr>
<tr>
<td>(%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selective Competition</td>
<td>116(0.0)</td>
<td>366(0.1)</td>
<td>339(0.1)</td>
<td>466(0.1)</td>
</tr>
<tr>
<td>(%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restricted Competition</td>
<td>269,962(60.3)</td>
<td>243,204(63.4)</td>
<td>207,565(61.0)</td>
<td>208,861(59.8)</td>
</tr>
<tr>
<td>(%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sole-source Contract</td>
<td>56,576(12.6)</td>
<td>42,587(11.1)</td>
<td>39,077(11.5)</td>
<td>42,061(12.0)</td>
</tr>
<tr>
<td>(%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>447,875(100)</td>
<td>383,765(100)</td>
<td>340,210(100)</td>
<td>349,713(100)</td>
</tr>
</tbody>
</table>

In spite of huge success of KONEPS, following limitations were also discussed. Limited protection to KONEPS users, lack of prevention of fraudulent and illegal tendering, and deficiency of support for wider use of e-procurement are some examples of this discussion. In the perspective of legal background of e-procurement, fragmented e-procurement legislation were criticized because it gives rise to inefficiency of regulation.

To overcome these limitations, “Act on Use and Facilitation of E-Procurement” was enacted on March 22, 2013 and took effect from September 23, 2013. There are seven chapters in this new Act. General provisions (Chapter 1), electrification of procurement tasks (Chapter 2), management of e-procurement system (Chapter 3), management and protection of e-procurement user’s information (Chapter 4), facilitation and support for e-procurement tasks (Chapter 5), miscellaneous (Chapter 6), and penalties. (Chapter 7)

The principal purpose of this Act is explained as two fold. (Article 1) First, through providing provisions on e-procurement, it is to guarantee security, credibility, and fairness of procurement tasks. Second, it is to facilitate the use of e-procurement itself. It is interesting that Article 1 of this Act mentions only three objectives of procurement: 1) security, 2) credibility, and 3) fairness. As is well known, there are many other objectives of procurement, such as value for money, competition, customer satisfaction, transparency, efficiency, to name a few. The reason why Korean legislators indicated only three objectives is that they did not think other objectives are not important but they wanted to focus on three objectives in legislating e-procurement.

“Korea on-line e-procurement system (KONEPS)” is defined as “an information system which is established and managed by Public Procurement Service (PPS) administrator and is used for conducting procurement electronically.” And “e-procurement” is defined as “a procurement which is conducted through KONEPS.” (Article 2) These definitions show that this Act focuses only on ‘PPS’ e-procurement system, although there are some other e-procurement systems in Korea (i.e. Department of Defense e-procurement system) which are not conducted by PPS. This reflects central figure of PPS as a centralized procurement agency in Korea.

In Chapter 2, digitalization of e-procurement is provided. The heads of customer agencies are obliged to make efforts to use KONEPS when they conduct procurements. As this customer agencies include not only central government agencies but also sub-central government agencies (local government agency) and other public institutions (ex: public enterprises), this coverage of this obligation is very large.

Solicitation and submission of bid should be conducted through KONEPS. (Article 5, 7) Bid-bond, contract-bond, and performance-bond can also be submitted through KONEPS. (Article 10) As KONEPS is connected with private bond company’s system, this electronic bond submission is widely used.
E-contract document should be made when contracting officer (CO) wishes to conclude contract with contractors through KONEPS. The contract takes effect when following three stages are all complete. 1) CO sends E-contract document through KONEPS, 2) contractor sends approval on e-contract document sent by CO through KONEPS, 3) CO sends confirmation letter to contractor through KONEPS. Second stage can be evaluated as an ‘offer’, and third stage can be evaluated as an ‘acceptance’. There needs no ‘consideration’ for legally binding contract in Korea, and that is a differing aspect in comparison to common law countries. To be a legally binding agreement, offer and acceptance are only required.

In these e-documents, such as bid submission, offer and acceptance, there should be e-signature. The timing of e-document sending or receipt is determined when these documents were typed in the KONEPS. There is no receipt of e-document when that document is typed in other system than KONEPS, and there is sending of e-document once that document is typed in KONEPS irrespective of true intention of person who sent that document. On top of that, person who sends the e-document cannot attach conditions to the effect of that document. “Framework Act on the E-Document and E-Commerce” is not applied in matters on sending and receipt of e-document through KONEPS. (Article 11) This shows that enhances level of security and credibility is applied to e-procurement in comparison to normal e-commerce.

Chapter 3 regulates the management of e-procurement system. In principle, the Head of customer agency should use KONEPS when he or she requests procurement contract conclusion to PPS. (Article 13) However, when the Head of customer agency deems it necessary, he or she can establish and operate its own e-procurement system which is connected to KONEPS. To establish and operate its own e-procurement system, the Head of customer agency should go through consultation with the Minister of Strategy and Finance. (Article 14) This consultation requirement was introduced to control the overlapping investment to e-procurement system by each agency.

Private institutions which are not public customer agencies can also conduct bidding and development new services through KONEPS with the approval of administrator of PPS. (Article 15) This provision expands the scope of customer of KONEPS from public institutions, such as central or sub-central governmental agencies, and public enterprises to private institutions such as private schools or hospitals. This shows the line between public procurement and private procurement can be loosened through e-procurement system.

Chapter 4 deals with management and protection of e-procurement user’s information, in other words, cyber-security issues. The administrator of PPS should manage bidding information, contract related information, or commodities catalogue information systematically through KONEPS. If the e-procurement users need to register or revise the commodities catalogue information, they should make request to the administrator of PPS. If the Head of customer agencies request bidding information, contract related information, or commodities catalogue, the administrator of PPS should provide the information according to the “Act on the Protection of Private Information.” (Article 16)

Private enterprises who would like to be a contractor in procurement should register in the KONEPS. (Article 17) With one-time registration, they can access any bidding which is conducted through PPS.

The Head of customer agency or contracting officer should not provide or distribute the trade secret of the contractor without its approval. The person who manages or managed the KONEPS should not distribute or use E-document or other information for other purpose than performing his duties. (Article 18) One should not obstruct the e-procurement through input of false information or corrupted order. One should also not counterfeit or falsify e-document or other information in KONEPS. (Article 19) One should not lend or transfer the e-certificate to other person to let he or she use in bidding through KONEPS. (Article 20) Person who discloses violations of Article 20 can receive a reward from the administrator of PPS. (Article 26) All violations of these three articles (Article 18,19,20) make one under criminal penalty. (Article 27-29)
Chapter 5 provides facilitation and support for e-procurement tasks. The administrator of PPS can conduct training program of e-procurement management for public servants, personnel of customer agencies or users. (Article 21) Based on this provision, PPS training center offers various training courses on e-procurement.

The administrator of PPS can manage following tasks to promote international development and export of e-procurement system: 1) promotion of e-procurement, 2) exchange of technology and personnel, 3) joint investigation and research, technical cooperation, 4) international standardization, 5) support and cooperation in domestic companies’ access to foreign e-procurement market, and 6) other tasks that the administrator of PPS deems necessary. (Article 22) This article shows the strong ‘developmental state’ tradition in Korea, in which central government takes a critical role in economic development.

The administrator of PPS can designate the ‘E-Procurement Support Center’ to development and stable management of KONEPS. This center conducts following tasks: 1) support of management and operation of KONEPS, 2) support of technology and education for stable operation of KONEPS, 3) support of access to foreign e-procurement development market and export of KONEPS, 4) Research and Development on facilitating electrification of procurement tasks, 5) support of international cooperation and promotion of procurement tasks, 6) support of domestic company’s access to foreign e-procurement market, 7) other tasks that are delegated from the administrator of PPS. This center can conduct profit-making activities to cover the costs necessary for performing above tasks. (Article 23)

From KONEPS’ inception in 2002, ‘E-Procurement Support Center’ was managed by big companies such as Samsung, LG. However, there were critics that stable management of KONEPS can be hindered when there is a labor strike in these private companies. For this reason, Presidential decrees of “Act on Use and Facilitation of E-Procurement,” which was newly took effect from 2013, provides that ‘non-profit organization’ should manage this center. Until now (January 2014), new ‘E-Procurement Support Center’ management organization is not determined yet.

The administrator of PPS can receive fee from following institutions or people: 1) customer agencies who directly conduct e-bidding, 2) bidders who wish to conclude contracts with customer agencies or private institutions, 3) agencies who use KONEPS to operate its own e-procurement system, 4) private institutions who use KONEPS to conduct e-bidding, 5) private institutions who use KONEPS to develop new services, and 6) e-procurement users who request registering or revising of the commodities catalogue information. (Article 25)

Although “Act on Use and Facilitation of E-Procurement” has integrated many provisions relating to e-procurement, some aspects of e-procurement are still regulated by other Statutes. “Presidential Decree of Act on Government Procurement” regulates Multiple Award Schedule (Article 7-2) and procurement data collection through KONEPS (Article 4-2). “Act on the E-Signature” may also apply to e-procurement. This Act provides that the Minister of Science, ICT, and Future planning may designate authentication institutions. (Article 4) Based on this Statute, PKI based authentication system is solely adopted. This approach enabled standardization of encryption and hence contributed to the facilitation of e-procurement system. However, this approach is criticized heavily recently because PKI based encryption system is not safe, and this system allows monopolized favor of certain institution. In this context, the revision of the “Act on the E-Signature” is discussed in National Assembly of Korea as of February, 2014, which shifts from ‘designation system’ to “registration system” in selecting authentication institutions.
6. Comparison among jurisdictions

(1) Overall Framework of E-Procurement Legislation

We can roughly differentiate three e-procurement legislation models according to e-procurement legislation in relation to general procurement law, and e-commerce related law.

Model 1 (Diffusion Model) represents diffused e-procurement legislation in each Statute, such as general procurement law or e-commerce law. In this model, tendering or award aspect of e-procurement is regulated by general procurement law, and e-document or e-signature is regulated by e-commerce related law.

Model 2 (Incorporation Model) represents the legal framework which incorporates e-procurement provisions into general procurement law. In this model, most aspects of e-procurement are regulated in general procurement law itself.

Model 3 (Integration Model) represents legal framework which integrates almost all aspects of e-procurement into independent legislation separated from general procurement law or e-commerce law. In this model, not only tendering or award aspects of e-procurement but also e-document and e-signature aspects are also provided in this independent legislation.

There can be many variations among these three models, and it is very hard to classify each jurisdiction exactly into these models. However, if we roughly compare overall framework of e-procurement legislation in each jurisdiction, UNCITRAL is mixing Model 1 and Model 2, European Union and US is more akin to Model 2, and Korea can be classified into Model 3. In UNCITRAL Model Law, many e-procurement provisions are incorporated. However, e-document or e-signature signature is regulated by different Model Law. EU and US’s general procurement law not only regulates e-procurement but also emphasizes enhanced security of e-procurement in comparison to private sector. These features lead EU and US to Models 2. Korea can be classified into Model 3, because it has “Act on Use and Facilitation of E-Procurement” which integrated almost all aspects of e-procurement.

The strength and weakness of these models can be summarized as follows.

<table>
<thead>
<tr>
<th>Model</th>
<th>Strength</th>
<th>Weakness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1</td>
<td>Enable easy regulation using pre-existing</td>
<td>Hard to understand overall aspects of e-</td>
</tr>
<tr>
<td>(Diffusion</td>
<td>legislations</td>
<td>procurement</td>
</tr>
<tr>
<td>Model)</td>
<td></td>
<td>May result tendering and award aspects and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e-commerce aspects (e-document or e-signature) of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e-procurement are separated</td>
</tr>
<tr>
<td>Model 2</td>
<td>Easy to understand e-procurement in</td>
<td>E-commerce aspects of e-procurement tend</td>
</tr>
<tr>
<td>(Incorporation Model)</td>
<td></td>
<td>to escape from the sight, as general</td>
</tr>
<tr>
<td></td>
<td>tendering and award context</td>
<td>procurement law is more focused on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>tendering and award</td>
</tr>
<tr>
<td>Model 3</td>
<td>Easy to understand overall aspects of e-</td>
<td>May result in inefficient separate regime</td>
</tr>
<tr>
<td>(Integration</td>
<td>procurement Avoid overlapping legislation on</td>
<td></td>
</tr>
<tr>
<td>Model)</td>
<td>e-procurement</td>
<td>both from general procurement law or e-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>commerce related law</td>
</tr>
</tbody>
</table>

(2) Relationship between e-procurement and tendering or award mechanism in general procurement law

As is already mentioned, “end-to-end e-procurement,” namely digitalization overall procurement process, from tender notice to award, is emphasized in almost all jurisdictions. However, it should be noted that
digitalization of each procedure in procurement (tendering/award/payment) cannot be implemented separated from contracting type or award criteria and associated discretion of contracting officers.

Korea can be evaluated to achieve higher level of “end-to-end e-procurement” in comparison to EU or US. Because almost all of tenders and payments are implemented electronically both in central and sub-central government level. But, this full digitalization of procurement in Korea is facilitated by its tendering and awarding system which focuses on price factors only. Even when the “economically advantageous tender” is applied, high emphasis is put on price factor which can be easily numerically quantifiable in Korea. To guarantee performance of contract, Korean procurement law provides “contract performance capability evaluation” which includes past performance, financial capability, etc. But in evaluation of this capability all the elements have certain points, and are added without discretion of contracting officer. Therefore, Korean system can be evaluated to focus on eliminating contracting officer’s discretion and avoid corruption, and this system is closely related with “end-to-end e-procurement.”

But US and EU has somewhat different tendering and awarding system in comparison to Korea. Although there are some differences between US and EU, it seems that negotiation procedures or “economically most advantageous tender” which focuses not only price factor but also non-price factor, are more actively implemented in comparison to Korea. Especially in negotiation procedure in US, tradeoff between cost factor and non-cost factor is not strictly quantified and contracting officers are given much discretion. [33] In this system, automation of information during tendering or award stage tends to have some limitation.

Recently, Korean public procurement law is moving toward best value approach. In this process, emphasis is put on negotiation and economically advantageous tender which focus not only on price factor but also on non-price factor. And many efforts are made to accommodate this new tendering and award procedure into e-procurement. This case shows that tendering and award procedure in procurement and its impact to e-procurement should be more carefully examined.

(3) Relationship between law and technology in e-procurement legislation

World Bank indicates three models on relationship between e-procurement related technology and law: 1) minimalist approach, 2) technology specific approach, and 3) two-tiered approach. Minimalist approach is a model in which all technologies for electronic signature are allowed, following a policy of technological neutrality. In technology-specific approach, regulations mandate specific technology to fulfill the legal requirements for the validity of an electronic signature. In two-tiered approach, the legislation sets a low threshold of requirements for electronic authentication methods to receive a certain minimum legal status and assigns greater legal effect to certain electronic authentication methods. [34]

UNCITRAL, EU, and US can be classified into Model 1. As is already mentioned, UNCITRAL took the “technological neutral” position. EU also took the similar approach to enhance competition in the Single Market. It is understandable that UNCITRAL and EU both aims to harmonize rule among member states, it is difficult to use certain technology in e-procurement. As was already mentioned, US also do not require certain technology in e-procurement implementation but there are disputes on the maintenance of this model. Korea, meanwhile, is more akin to Model 2 because it adopted PKI based authentication system, but Korea is now discussing on moving toward Model 1. There are some difference of emphasis in adopting Model 2 in US and Korea. As is demonstrated in following comment, US are more aware of discriminatory effect to cross-border procurement.

"At some point, however, U.S. policymakers probably will have to surrender a measure of technological neutrality, and to embrace some common form of electronic encryption, to secure
procurement processes. The United States, like other countries, may well adopt digital signatures, using a technology known as “public key infrastructure” of PKI, as the encryption method of choice for federal procurement. In doing so, however, U.S. policymakers will have to grapple with the discriminatory, anticompetitive impact that their choice of PKI technology—a complex technology, with significant attendant cost and burdens—may have on the procurement process.” [28]

This perspective is in line with the reason why UNCITRAL and EU adopted Model 1 based on technological neutrality. However, the security quality of PKI itself and competition among various authentication methods are more critical issue in Korea. Based on each jurisdictions experience, the strengths and weaknesses of each model can be mentioned as follows.

<table>
<thead>
<tr>
<th>Table 7</th>
<th>Three Models of law and technology in e-procurement</th>
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<tbody>
<tr>
<td></td>
<td>Strength</td>
</tr>
<tr>
<td>Model 1</td>
<td>Flexible to technological development</td>
</tr>
<tr>
<td>(Minimalist Approach)</td>
<td>Facilitate cross-border procurement</td>
</tr>
<tr>
<td>Model 2</td>
<td>Uniform authentication system can enhance overall uniformity of procurement</td>
</tr>
<tr>
<td>(Technology Specific Approach)</td>
<td>Reduce risks of vendors to choose various authentication methods according to different procurement chances</td>
</tr>
<tr>
<td>Model 3</td>
<td>Can adapt to different level of security need in one jurisdiction</td>
</tr>
<tr>
<td>(Two-Tiered Approach)</td>
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</table>

Korean model shows that technology specific approach can be a facilitator of e-procurement. However, as the procurement market grows, cross-border competition and security quality of specific technology became more important issue in Korea. Korean experience gives a lesson that each countries, especially developing countries which are in the process of establishing e-procurement system, should be not be forced to adopt minimalist approach.

(4) Coordination among different agencies in implementing e-procurement

One of the crucial needs of coordination among different agencies happens in the use of framework agreement or IDIQ contract, because this type of contract can be successfully implemented through the cooperation between procuring agency and customer agency. In this respect, the role of centralized procurement agency is emphasized in EU. GSA (US), PPS (KOREA) also takes this role in conducting this type of contracts.

However, in implementing framework agreement or IDIQ contract, following legal issues should be addressed. The merits and defects of closed system and open system should be carefully examined. For example, Korea’s Multiple Award Schedule System (MAS), which adopted closed system has been criticized for allowing collusion among competitors. This shows e-procurement do not eradicate corruption automatically.

To harmonize various e-procurement systems or to reduce overlapping investment in e-procurement is also emphasized in US and Korea. In US, OFPP takes this coordination role and Minister of Strategy and Finance takes this role in Korea. Despite highly centralized features in e-procurement and coordination role of Minister of Strategy and Finance, overlapping investment issues are not resolved yet. Because many agencies which
established their own e-procurement system before Minister of Strategy and Finance took the coordination power, are hesitant to be integrated into KONEPS.

To integrate or coordinate between e-procurement system and e-budgeting system is also emphasized both in US and Korea. When this integration or coordination is successful, budget planning or performance budgeting can be strengthened. However, this initiative is not well implemented in Korea yet. The main reason is that these two systems are operated by different agencies (Ministry of Strategy and Finance, PPS) based on different Statutes (Act on State Finance, Act on the Use and Facilitation of E-Procurement).

7. Conclusion

This paper analyzed e-procurement from the comparative law perspective. From this study, following implications can be drawn. First, overall framework of e-procurement related law should be approached comparing the strength and weakness of each model. There can be three models: 1) diffusion model, 2) incorporation model, and 3) integration model. In any case, overlapping legislation should be avoided, and it should make e-procurement users both in public and private sectors understand the system more easily.

Second, it can be modestly said that full digitalization of procurement is more compatible with tendering and awarding system which focuses on quantifiable factors such as price because automatic quantification or scoring is made easier in this system. Therefore, adaptability of e-procurement to competitive negotiation and economically most advantageous tender, which focuses more on non-quantifiable factor should be more enhanced in the future.

Third, it is important to balance between security of the system and cross-border competition when choosing among the three approaches on the relationship between law and technology: 1) minimalist approach, 2) technology specific approach, and 3) two-tiered approach. While UNCITRAL, EU, US chose the minimalist approach, Korea traditionally chose the technology specific approach. While this approach is evaluated to contribute to the facilitation of e-procurement of Korea, it is also heavily criticized for many reasons (including restricting cross-border competition) recently. This shows the strength and weakness of technology specific approach should be carefully examined.

Fourth, coordination among different agencies is crucial for the successful implementation of e-procurement. For example, for the successful adoption of framework agreement or IDIQ contracts, it is recommended to have centralized procuring agency (i.e. GSA, PPS) and its implementing legislation. To harmonize various e-procurement systems or to reduce overlapping investment in e-procurement, it is necessary to have a coordinating agency (i.e. OFPP in US, Minister of Strategy and Finance in Korea) based on relevant law. To integrate or coordinate e-procurement and e-budgeting system, it is important that relevant organizations and legislations are well coordinated.

Following suggestion can be made for future research. First, the relationship between e-procurement and tendering or award mechanism in conventional procurement law should be researched in more detail. For example, recent comparative legal research shows that EU procurement law more focuses on competition in the Single Market, while US procurement focuses more on value for money. [33] How this difference affected tendering or award mechanism in both jurisdiction and how this difference affected the divide the e-procurement legislation in both jurisdictions? This research will definitely make e-procurement literature more fruitful in the future.

Second, the effect of new integrated model should be researched in the future. Korean model, which adopted this model in 2013, is a unique case world-wide. This paper did not evaluate this model neither
positively nor negatively, because it is too early to evaluate whether this model is successful or not. However, as
new Korean legislation also contains the provisions which other jurisdictions do not have (such as management
center, export of e-procurement system), it will be very meaningful to evaluate the success and failure of this
legislation in the future.
References


RE-EXAMINED E-PROCUREMENT IN DECENTRALIZED-
INDONESIA’S LOCAL GOVERNMENT PROCUREMENT SYSTEM

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ABSTRACT

E-procurement is an important instrument to prevent corruption in goods and services procurement budget. Indonesia has been implementing the e-procurement project since 2008 based on Presidential Decree. President has been stipulating annual order (presidential instruction) in which this has to be obeyed by all ministries and local governments to procure their budget through e-procurement mechanism. However, until 2012 fiscal year, this research found that only around 10.26% of central government institution procurement budget, including ministries and 21.10% of local government procurement budget did procure through e-procurement method. The research question is how are local procurement governance in responding central government procurement policy? How they do handle with local politics in managing local procurement? This research focus on four local governments in Indonesia namely Jogyakarta city, Tangerang City, Kutaikartanegara Regency and Riau Island Province. The research method is combined qualitative method and quantitative one in order to answer research question in-depth. This research finding concluded that regulation, leadership and procurement institution, regulations, and procurement policy are challenging factors to make “status quo” e-procurement. The local procurement agencies have to deal with local politicians in dealing with procurement decision in different political context.

Keyword: e-procurement, corruption, local procurement governance

Introduction

In 2008, the Indonesian government created INAPROC in order to deliver goods and services procurement electronically. In five years, there have been increasing numbers of e-procurement instruments: the number of system providers went from 11 in 2008 to 491 in 2012; service providers went from 3 in 2009 to 43 in 2012; provincial coverage increased from 9 in 2008 to 33 in 2012 and user agencies increased from 11 to 731 user agencies in between 2008 and 2012. This trend was followed by the number of tenders issued through e-procurement. In 2008, there were only 33 tenders and this number increased to 119,797 in 2012. INAPROC claimed that there was a savings of 10.89% in 2012.

Until now only a small amount of research about Indonesian e-procurement has been done. Kodar (2010) found that the implementation of e-procurement at Yogyakarta Municipality in 2009 was visible but not accountable. Nightishaba, et al (2012) found that committee and the procurement of goods and services providers to the implementation of e-proc system have a difference in perception between the users of e-procurement supplier of goods/services and the procurement committee. Utama (2009) found in the experience of Yogyakarta city that strong leadership, underlying laws/regulations/policies, available resources (human, budget, infrastructure), as well as changes in management had an influence on the smooth process of implementing e-procurement. Nevertheless there are also some other factors involved, such as influential support from legislators, the benefits of the application, and guidance from the central government. There are all factors affecting the implementation of e-proc, in addition to the commitment that comes from implementing elements.
The research done by some researchers above is insufficient to figure out e-procurement implementation in Indonesia since it was launched in 2008. This study is a continuation of my previous research that discusses the influence of leadership in the implementation of the strategic plan in the government sector, including both local governments and the national government. My interest is to see how the factors affect the e-procurement institution, how they affect the leadership, and how they affect the implementation of e-procurement policy in Indonesia. Thus, through this research I want to strengthen my scientific knowledge in the field of public organizations, especially in Asian countries, and to contribute to the body of knowledge of the public organization theory.

The Committee for the Monitoring of Local Autonomy found that only 62% of the regency /city (kabupaten/kota) level has implemented e-procurement in different levels of implementation. The Executive Director of the Committee Monitoring the implementation of Regional Autonomy (KPPOD) Robert Endi Jaweng says that the situation is not in accordance with Regulation No. 54/2010. According to him, the regulation requires the entire K/L/D/I [Ministries/Agencies/units of Work Device region/other Institutions] to be already implementing e-procurement at the end of 2012 at the latest. Even in the Moluccas, all districts/cities do not have e-procurement. In West Papua 9% [Kabupaten/Kota that are implementing e-procurement], whereas in the provincial level has not been implemented it yet, he explained to business, on Sunday (7/10/2012). Along with the authority given to regional governments, however, these authorities have not been balanced with accountability, there for the cases of corruption in the local government. In line with the majority of the theoretical literature, we argue that the monitoring of bureaucrats’ behavior is an important determinant of the relationship between decentralization and corruption (Lessman and Markward, 2009).

One of the causes of corruption is the lack of accountability of the procurement of goods and services in the local government. The study of Indonesia Procurement Watch on 793 respondents of government goods and services providers in Jabotabek (Jakarta, Bogor, Tangerang and Bekasi) found that 92.7% respondents had bribed government officials, while it was only 1.3 percent said that they never practiced bribery. Studies conducted by the Anti-Corruption Agency in 2012 of Aceh’s goods and services procurement showed similar phenomena. This study also found that the number of alleged incidents of corruption improper procurement and the complexity of the procurement process did not affect the willingness to appoint procurement committee chairmen. Based on the survey, only 34.2% of respondents are unwilling to be appointed as Chairman of the Committee on procurement. Concerning e-procurement, most respondents answered that the new system and the integrity of the human resources were not yet ready.

In addition, Gordon (2007) said that there is always a bias in the study of empirical e-procurement research. The researchers do not address the market shaping, contestability, and shared services. The literature also has a weakness in the same of e-procurement process in the private sector and the public sector. The public sector has a lot of political interests compared with the private sector. Another weakness in previous studies was that the e-procurement strategy focused on the operational procurement as opposed to strategic procurement decision making. Thus, it is reasonable that corruption in the case of goods and services procurement in Indonesia started from the planning through the actuating done by the politician, even though the e-procurement has been done. There are more opportunities for corruption in the planning process, for instance ministers, politicians, or senior officers may plan the unwanted project for their private interests (Neupane, et al, 2012). Research problems which will be answered in this research are what the policy, institution and regulation, system, infrastructure, resources and human resources of e-procurement in local government? How is the relationship between procurement managers and politicians at the local government level? What is the influence of policy, institution and regulation, system, infrastructure, resources and human resources of e-procurement efficiency and effectiveness in the perceived e-procurement local government manager To look at the dynamic e-procurement implementation at local level, researchers investigated relationships between variables such as leadership, human resources, planning and management, policy, regulations, infrastructure, standardizations, private integration and systems of e-government procurement on the efficiency and the effectiveness of e-procurement. The research sample consisted of 120 procurement officials in four local governments.

**Theoretical Framework**

Thai (2001) stated that procurement in a complex system (Checkland and Scholes, 1999, p. 19) or a system which works by itself (Childs, Maull, &Bennett, 1994; Childs, 1995; Dror, 1971; Kock & Murphy, 2001;Lineberry, 1977). Institutional arrangements may be organized so as to limit the opportunities for corruption, or to render such opportunities less profitable (Ogus, 2003). The government consists of an executive branch, a legislative branch,
and of the implementer of e-procurement himself”. Thai (2001) mentions that the executive’s duties in procurement are as follows:

- To complete and to add the policy which has the form of law and the procedure of goods and services through the executive’s order;
- To improve and to maintain the policy which has the form of law and the procedure of procurement;
- To decide whether the fulfillment of the needs of the program should be done by the government or given to a third party.

What has been done by the executive is certainly in the framework of setting up a policy or regulation in implementing e-procurement. Thai (2001) mentioned established procurement policies and regulation which work together with legislative. Thus, Thai (2001) describes in box 2 that the next procurement system is the Policy of Procurement. Scraper et al. (2006) explained that “strong regulation in an e-procurement system was created to minimize unexpected discretion and out of the risk limit”, and Thai (2001) explained that the regulation toward this procurement of goods and service is to:

Box (1) is policy and management. In democratic countries, procurement is done by an executive unit, usually a president, a prime minister, a governor, a mayor, or a regent who has responsibility to run public procurements which may include, among others:

- Supplementing and augmenting statutory procurement policies and procedures through executive orders;
- Developing and maintaining statutory procurement policies and procedures; and
- Determining whether to meet program needs by in-house performance or by contracting out (Thai, 2001).

Decentralization or centralization are becoming important issues in e-procurement management at the national level. Coulthard and Castleman (2001) stated that a decentralized approach such as Australia’s may maintain agency and line manager flexibility and authority but fails to:

- Provide adequate direction on how objectives will be achieved
- Maximize the advantages of a whole of government approach

However, centralization of procurement allows a procurement unit to determine whole of government or whole of agency purchasing patterns and to ‘bundle’ or aggregate these purchases and increase the purchasing power of the Government (Coulthard and Castleman, 2001). The UK Government has adopted this approach and established a central agency, the Office of Government Commerce, following the recommendations of the Gershon (1999) report. Gershon (1999 in Coulthard and Castleman, 2001) in his review of UK civil procurement found:

- Decentralist and delegated authorities had no common framework and coherence, lacked consistency, and provided insufficient aggregation to take full advantage of the market.
- There was a clear need for a central body to provide appropriate aggregation and co-ordination. Current arrangements according to Gershon ‘lacked the “clout” to lead Government procurement in the 21st Century’ (1999: 5) and

There were no common measurement systems of procurement across government. Gershon (1999: 9) reported that ‘the complete absence of any such systems is the finding that gave me the greatest concern during the course of the review’. The objective of the implementation of e-procurement in the public sector is reformation process of goods and services procurement. From the various studies done based on the experience of the countries around the world, the implementation of e-procurement is to prevent or to reduce the level of corruption. Neupane, et. Al. (2005). E-procurement can improve the efficiency over traditional procurement methods (Chang, 2011 and Hanna, 2010). The process of goods and services procurement electronically has obviously omitted the use of paper for the providers or the budget users. The providers just upload all documents by the existing website without coming to the office. E-proc can also reduce the less necessary projects (Achterstraat, 2011). With e-proc, only the projects needed by the people need be sold at auction. However, this assumption is only valid in the economically advanced countries. In developing countries, many projects are proposed by politicians for their personal interests (Murray, 2007).

**Leadership and E-procurement**

Much previous research on e-procurement showed relationships between leadership and organization innovation, particularly the application of information technology in government organization. Addressing the issue from the angle of technological diffusion, MacManus (2002) found that leadership is a key factor endorsing the

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b : Professor of Korea University
Proposition 1: The high level of top management support is positively associated with the efficiency and effectiveness of e-procurement initiatives.

**Human Resources and E-Procurement**

The adoption of e-procurement in government requires the support of human resources. More capable human resources affects the speed of adoption of e-Procurement. Henriksen and Mahnke (2005) said the public managers need sufficient resources and the mandate of the political leadership to successfully adopt E-Procurement. Political structures need to be considered as much as the economic rationalities to better explain E-Procurement adoption. Apart from IT Sophistication, organizational factors only moderately influence the adoption of E-Procurement, but Employee Acceptance (EA), Financial Resources (FRs), Political Commitment (PC) and Centralization (CE) are the strongest determinants of E-Procurement adoption in Germany (Veit, et.al, 2012). The OGC (2002) recommends that increasing change in underlying processes requires more learning and effort on the part of users. Consequently, some researchers (Hyoun Lim, 2010) and (Moon, 2005) found that the lack of technical, personnel, and financial capacities are perceived to be major barriers to the development of e-government in many municipalities of USA.

Proposition 2: The high degree of human resources program is positively associated with the efficiency and effectiveness of an e-procurement initiative.

**Planning and Management**

E-procurement projects in many countries need clear plans, support, and well-prepared management systems. A UNPAN report (2012) noted it is therefore vital to e-government transformation that governments appoint an official with real authority across departmental and ministerial boundaries to facilitate strategy and decision-making regarding the country’s ICT architecture, and to assist agencies in their efforts to run more effective and efficient programs. Therefore, a clearly defined e-Procurement strategy not only emphasizes the importance of e-Procurement in the public sector but takes into consideration major institutional changes from the procurement process perspective as well as from the organizational perspective (WB, 2003).

Proposition 3: A clear plan and management execution of an e-Procurement implementation strategy is positively associated with the efficiency and effectiveness of an e-procurement initiative.

**Policy and Regulations**

The key point of public procurement is policy and regulation on procurement. Clearly at the public procurement policy level, there is a fundamental and accepted difference between public procurement and private sector procurement (Murray, 2007). Since the public sector has different characteristics from the private sector, public procurement is mainly a process of political decisions on how the government gets public goods and services at efficient costs. Contrary to Europe, Asia has not yet adopted a specific e-procurement regional policy or legal framework. Nevertheless, elements for legal validity of e-procurement can already be found in the “e-ASEAN Reference Framework for Electronic Commerce Legal Infrastructure”. However, this instrument is not compulsory. Instead, it serves only as a guideline. At the national level, many Asian countries such as China, Malaysia, Philippines and the Republic of Korea, have undertaken massive reform of their public procurement legal
environment as part of their national e-government action plan (UN ESCAP, 2006). Vaidya et al., 2009. In public procurement, public procurement managers need to insulate and protect themselves against the possible conflicting demands of various stakeholders (Anancani, 2009; Purchase et al., 2009). Also, interns of application of rules a wide variation was found and there are sons for these variations were heavily driven by a hierarchical downward flow of verbal and non-verbal instructions based on varying degrees of interpretation of respective rules and standard procedures (Khan, 2012). In sum, Macnus (2002) said that the public sector’s regulatory restrictions and organizational dimensions are the biggest deterrents to e-commerce.

Proposition 4: The regulations and policy support is positively associated with the efficiency and effectiveness of an e-procurement initiative.

System Integration and E-Procurement

In Taiwan, the limited integration of e-government creates repetitive information building, inconsistent information content, and information security problems (Chiang and Hsieh, 2007). Government propose the integration system required gradual reform to integrate complex online systems and databases. It is also critical to link the e-Procurement system to the financial management system in order to facilitate the process of online payment to suppliers (WB, 2003). Given its disruptive nature, national state-wide e-procurement should be done by an independent new agency with resources, processes, persons and values different from those of the incumbent procurement officers (Baharona, et al., 2012); it is necessary for purchase transactions to be carried out through an electronic ordering transaction support system (Vaidya, et al., 2009).

Proposition 5: The high degree of system integration is positively associated with the efficiency and effectiveness of an e-procurement initiative.

Infrastructure and Standardization

For many developing countries, the information infrastructure is the main problem for e-procurement initiatives. Based on Soekiman and Sapodra’s (2010) research finding in Lampung Province, Indonesia, the most five influential barriers in e-procurement implementation are (1) planning; (2) infrastructure, (3) standardization, (4) enthusiasm and (5) security. The other study found that the reliability and capability of the infrastructure (particularly network connectivity) has a direct impact on the operational performance of the e-procurement system (Croom & Brandon-Jones, 2009, Engström et al., 2009, Vaidya et al., 2009, Ha & Coghill, 2006).

Proposition 6: The degree of infrastructure quality is positively associated with the efficiency and effectiveness of an e-procurement initiative.

Discussion

In this section, we try to explore the unique practices of e-procurement in three local governments in their responses to national regulations. How do local governments implement their e-procurement programs in their local contexts? We have chosen four local governments with a variety of e-government programs, namely Jogyakarta City in Jogyakarta Special Province, Tangerang City in West Java Province, and Kutaikartanegara Regency in East Kalimantan and Riau Island Province. Jogyakarta city, the capital city of Jogyakarta Special Province, has successfully won an e-government award since 2009, granted jointly by the Ministry of Information and Telecommunication and Economist Magazine of Indonesia. This city is considered to have successfully implemented smart city governance supported by information technology. Tangerang city, a second research case city, has also successfully earned an e-government achievement in four times from same ministry. This city also has been granted as an “unqualified opinion” in its financial report by the National Audit Board (BPK) six times since 2008. Meanwhile, Kutaikartanegara regency is in the early stage. 

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b: Professor of Korea University
developing an e-government program and was recognized as an *Information and Communication Technology (ICT) Para* in 2012, considered to be a local government having good e-readiness to e-government.

**Regulations and Institutions of Public Procurement**

Looking at the institutions involved in the procurement, it is fair to say that fragmentation and decentralization of institutional procurement occurs. Each region has authority to conduct its own procurement, and there is no enforcement to implement the e-procurement. National Procurement Agency (LKKP) is an institution which is responsible for e-procurement, based on the Presidential Decree No 54, 2010.

![Diagram](image)

*Fig. 1. Fragmented Central and Local Procurement System Within the Executive Branch*

Each ministry, non-ministry institution, and regional government can set up an independent Procurement Service Unit which is separated from the organization units which make the budgets. This separation function is aimed to avoid the collusion and the autonomy of the procurement process. Each Institution which is called ULP (Procurement Service Unit) is created based on Minister Decree or Head of non ministry institution and regional head. Yayan Rudianto’s (2011) study on legal format mentioned that based on the President Decree No. 54 – 2010, that National Procurement Agency (LKKP) is the only non-department institution in Indonesia which has the authority to improve and formulate the policy of government goods/services procurement. Concerning the question of what is the relation between the President and National Procurement Agency with the Procurement Service Units in the ministry institution like, Rudianto said that:

*First*, the relation of the President. This relation is as clear as command lines. The tasks and function in carrying out the goods/services procurement in K/L/D/I is carried out by ULP. ULP is a government organization unit which

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*b* : Professor of Korea University
functioned to carry out the goods/services procurement in K/L/D/I permanently, independently or jointly with the existing unit. K/L/D/I has to have ULP (Procurement Service Unit) which is able to give service/guidance in goods/service procurement sector.

Second, the three-way relationship between the President and province and regency/city. This relationship uses two mechanisms at once, which are a functional mechanism and a deconcentration mechanism. In the functional mechanism, the function of government goods/services is carried out by a Procurement Service Unit (ULP). This relationship doesn’t implicate the institutional improvement of the National Procurement Agency entirely (4 deputies), but there is a possibility for the deputy which has the similarity in technical, that is Deputy of Law and Protest Solution. The level of this unit is below and responsible to the governor, the duty, function and the authority are constant, the organizational structure is integrated in the existing ULP, either /D/ province creates and independent unit or joined to the existing unit, the National Procurement Agency has just to adapt the relationship between the President and /D/ residency/city. The relationship is based on the mechanism of decentralization. The President is not as free to act as the governor, because most of the government business which had been handled by the government has been handed over to the region (regency/city).

Each local government can set up an autonomous e-procurement institution (LPSE) responding to the annual Presidential Instruction on Corruption Prevention Action. Each local government has to achieve procurement of local budget at 40% of its total budget.

<table>
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<th>Table 1. Regulations and Procurement Independent Unit</th>
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<tr>
<td>Decree</td>
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<td>Mayor Regulation No. 84 Year 2010</td>
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<tr>
<td>E-procurement start</td>
</tr>
<tr>
<td>Background</td>
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<tr>
<td>E-procurement status</td>
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<td>Unit</td>
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We can look at data on the beginnings of these three local governments’ e-procurement projects in 2010 with autonomous e-procurement models. Mayors’ or regents’ (head of local government) regulation is a legal basis for implementing e-procurement projects. The legal standing of such projects is presidential regulation (No. 54 Year 2007) and National Procurement Agency Decrees.

The city Yogyakarta had a Procurement Service Unit (ULP) since the year 2009 with the consideration of the existence of a) unpleasant procurement of goods/services handled by Local Government Secretariat and the units of work; b) Procurement Committee still could be intervened by the structural leadership; c) The high number work packages local government agencies; d) limited number of certified procurement Committee and e) is required to standardize the procurement document. Legal basis for the establishment of the ULP is the Mayor Regulation of Yogyakarta No. 91 in 2008 about the Procurement Services Unit (Procurement Unit). In 2008, the ULP Government of Yogyakarta is attached at the City government Secretariat Area Development Control Agency with membership consisting of the person in charge, the Director, Manager, and members who shared in procurement team.

Meanwhile, Tangerang City government set up a Procurement Service Unit in 2010 based on Mayor Regulation No. 40 Year 2010. The main objective of the units to prevent corruption in good and service procurement purchasing. This unit was recognized by the National Procurement Agency in 2011 and 2012 based on its having the highest proportion of local budget purchased through e-procurement. In contrast to the case of Yogyakarta City which is under the City Government Secretariat, the procurement service unit in Tangerang and Kutai Kartanegara is managed by Information and Technology Agency with echelon IV. However, the independency of the procurement unit is likely as high as in Yogyakarta City. In Kutai Kartanegara, the procurement unit is managed by the Information and Communication Agency, which has 420 procurement officials.

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b: Professor of Korea University
Organization and Resources

The Independent Procurement Unit of Jogyakarta city is a permanent unit established by the Decree of Mayor. This unit is attached to the Control and Monitoring Section at the Secretariat of City Government, which is headed by a head (echelon III) and supported by deputies and a procurement team. Currently, there are 45 certified procurement officers. IT infrastructure capacity consists of the internet at a speed of 2.5 Mbps and an intranet environment in Yogyakarta City Government, as well as an IBM System x3650M2-72A server, Debian Linux Operating System, 8 GB of memory and two 300 GB hard disks. The Independent Procurement Unit has been facilitating from within an office building and recruiting procurement officials from different city agencies, so they may not fully do the procurement job.

It is highly desirable to be able to dig beyond these histories and their resources, we try to investigate the proportion of local government expenditure purchased by e-procurement system. The higher levels of procurement in local expenditure are more organized by the local government. In other word, there is a significant role that can be seemingly done by a mayor or a regent to pressure their subordinates to obey procurement regulation. It is fair to say that the compliance of three local governments to President Instruction is higher than central government institutions. They have made good efforts to make goods and services procurement more accountable and transparent in their respective areas. Jogyakarta city is a “good boy” in doing e-procurement for almost 100% of its budget in both 2011 and in 2012. Another study found that the great improvement of Yogyakarta city in purchasing almost one hundred percent its budget through e-procurement was driven by the mayor and followed a process of a typification process.

Beyond this, we try to investigate some variables affecting procurement process at local level. There are some actors in procurement watch who have become essential in controlling public expenditure, namely civil society, the media, academic institutions, public commission and oversight boards. The exploration of these matters will be analyzed in the next section. In 2008 the efficient auction amounted to 8.23% and it has continued to increase every year. In 2009 there were 13.8%, in 2010 was 15.29%, 2011 was as much as 15.6% and in 2012 was 16.09%. This increase shows that the auction there is already well. The types of procurement of goods and services from the year 2008 to 2012 are as follows:

Primary data from the respondents was collected using a crosssectional survey conducted in the five local governments of Indonesia. Therandomly selected sample was comprised of 230 elements representing procurement management units [3]. Before the commencement of the survey both focus group held discussion (FGD) meetings and pre-testing of the measuring instrument. In both exercises, the procurement practitioners were involved to enable the assessment to have face validity. Such pre-field deployment research tasks allowed for the study’s questionnaire to be improved by either rewording or deletion of the items found to be ambiguous during the pilot phase. The pilot study, which involved 30 procurement practitioners, facilitated the improvement of theresearch instruments as well as the determination of the reliability of the scale items. Response from the final survey involved 150 fullycompleted questionnaires, 25 incomplete questionnaires and 33 unreturned questionnaires.

Validity and Reliability Assessment

The questionnaire was refined via several rounds of experts’ reviews and pre-testings before the actual distribution took place. For content validity purposes, an extensive review of the literature was undertaken to gain an understanding of each construct and its items, and to ensure that no important dimensions were neglected. 10 e-procurement practitioners and 10 academicians/researchers participated in this process. Each item on the questionnaire was reviewed for its content, scope, and purpose. Their feedback resulted in several modifications to the items. Two rounds of pre-testings were carried out to ensure that the instrument was well designed and contained items that really measure the constructs.
### Item-TOTAL Statistics

<table>
<thead>
<tr>
<th></th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-TOTAL Correlation</th>
<th>Squared Multiple Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
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<tr>
<td>p1</td>
<td>26.8667</td>
<td>5.844</td>
<td>.576</td>
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<td>p2</td>
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<td>.680</td>
<td>.</td>
<td>.894</td>
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<tr>
<td>p3</td>
<td>27.1333</td>
<td>5.913</td>
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<td>.879</td>
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<td>p4</td>
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<td>.847</td>
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<td>.875</td>
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<td>.847</td>
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<tr>
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<td>6.303</td>
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### Table 3. Descriptive Statistics

<table>
<thead>
<tr>
<th>No.</th>
<th>Aspect</th>
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<th>Yogyakarta</th>
<th>Kutaikartanegara</th>
<th>Riau Island</th>
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</thead>
<tbody>
<tr>
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<td></td>
<td>N</td>
<td>Min</td>
<td>Max</td>
<td>Mean</td>
</tr>
<tr>
<td>1</td>
<td>System E-GP</td>
<td>30</td>
<td>44</td>
<td>55</td>
<td>47.9</td>
</tr>
<tr>
<td>2</td>
<td>Regulations</td>
<td>30</td>
<td>42</td>
<td>51</td>
<td>44.2</td>
</tr>
<tr>
<td>3</td>
<td>Infrastructure/Web Service</td>
<td>30</td>
<td>38</td>
<td>50</td>
<td>41.1</td>
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<td>4</td>
<td>Planning and management</td>
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<td>36</td>
<td>45</td>
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<td>5</td>
<td>Leadership</td>
<td>30</td>
<td>31</td>
<td>44</td>
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</tr>
<tr>
<td>6</td>
<td>Human resources</td>
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<td>35</td>
<td>45</td>
<td>38.1</td>
</tr>
<tr>
<td>7</td>
<td>Standard</td>
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<td>31</td>
<td>41</td>
<td>36.2</td>
</tr>
<tr>
<td>8</td>
<td>Policy</td>
<td>30</td>
<td>27</td>
<td>40</td>
<td>34.5</td>
</tr>
<tr>
<td>9</td>
<td>Private Integration</td>
<td>30</td>
<td>30</td>
<td>40</td>
<td>33.4</td>
</tr>
<tr>
<td>10</td>
<td>Efficiency and effectiveness</td>
<td>30</td>
<td>27</td>
<td>35</td>
<td>29.4</td>
</tr>
</tbody>
</table>

|       | Valid N (Listwise) | 30 |

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a, c, d, e : Researcher of Jusuf Kalla School Government of Universitas Muhammadiyah Yogyakarta  
b : Professor of Korea University
Table 4  Pearson’s Correlation Coefficient

<table>
<thead>
<tr>
<th></th>
<th>Yogya karta</th>
<th>Tange rang</th>
<th>Kutai Kar te nagara</th>
<th>Riau Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership</td>
<td>0.046</td>
<td>0.438</td>
<td>0.174</td>
<td>0.151</td>
</tr>
<tr>
<td>Human Resources</td>
<td>0.448</td>
<td>-0.049</td>
<td>0.400</td>
<td>0.209</td>
</tr>
<tr>
<td>Planning and Management</td>
<td>0.098</td>
<td>0.520</td>
<td>0.419</td>
<td>0.14</td>
</tr>
<tr>
<td>Policy</td>
<td>0.070</td>
<td>0.171</td>
<td>0.097</td>
<td>0.508</td>
</tr>
<tr>
<td>Regulations</td>
<td>0.464</td>
<td>0.151</td>
<td>0.153</td>
<td>0.364</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>0.091</td>
<td>0.494</td>
<td>-0.086</td>
<td>0.761</td>
</tr>
<tr>
<td>Standardization</td>
<td>0.101</td>
<td>0.191</td>
<td>-0.045</td>
<td>0.622</td>
</tr>
<tr>
<td>Private Integration</td>
<td>0.023</td>
<td>0.708</td>
<td>0.196</td>
<td>0.632</td>
</tr>
<tr>
<td>System of E-GP)</td>
<td>0.374</td>
<td>0.625</td>
<td>0.368</td>
<td>0.644</td>
</tr>
<tr>
<td>R-Squared</td>
<td></td>
<td></td>
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</table>

The table above presents the bi-variate correlations of this study’s measures. Most of the relationships were not significant and negative at the different local setting. In Yogyakarta City, human resources, regulations and laws, e-procurement system were positively related to effectiveness and efficiency of e-procurement (correlation coefficient ranged from 0.378 to 0.468). Meanwhile in Tangerang City, leadership (0.438), planning and management (0.52), infrastructure (0.498), private integration (0.708) and e-GP system (0.625) were positively associated with dependent variable. In third case of Kutai Kartanegara regency, human resources, planning and management and E-GP system were positively related to effectiveness and efficiency of e-procurement. These variables showed statistically significant (t-test) p<0.05 and correlation values ranged from 0.38 to 0.418. However, in Riau Province, policy, infrastructure, standardization, private integration and system e-procurement were linked positively to the dependent variable.

To investigate the relationship between the independent variables and dependent variables, a regression test was used. In Yogyakarta case, the test was significant on ten variables, and there was only one variable positively related to effectiveness and efficiency of e-procurement, namely regulation and policy. This study actually starts from two questions. First, we focus on confirming that traditional variables actually affect the efficiency and effectiveness of e-procurement. Second, we try to answer why some variables have no effect on the dependent variable. Throughout the test, the impact of all independent variables on efficiency and effectiveness of e-procurement were not statistically significant at any of the local governments. Although this differences does tell us the relative effectiveness of the e-procurement initiative.

Regulations and Policy

These results give us a hint that there might be human resources, regulation and e-GP system which will become influencing factors in Yogyakarta. For example, Huruholt& Wahid (2008), E-procurement initiatives need to ensure

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b : Professor of Korea University
a long-term commitment of resources, and to unify different factions. There is a digital gap between the Committee and the procurement of goods/services providers. However, this gap is not outrageously wide, but it must be addressed and bridged by e-procurement system (Nightisabha, et al., 2009). From the regression test of the case of Yogyakarta revealed that only one variable that influence on the effectiveness and efficiency of e-procurement, namely regulation and policy. Test results prove this analysis results in the previous chapter that shows that the main weaknesses of the implementation of e-procurement is a legal vacuum or less strong legal basis that became the foundation for implementing procurement at the local level. One of the vacuums in e-procurement regulation is public watch regulation in order to prevent corruption in public purchasing. “one of (the) factor(s) causing deviation of procurement isthe vacuum of regulation on surveillance done in whole procurement phases and processes, so it creates the potential state budget loss or misuse” stated by Said Iskandar, West Kalimantan province activist”.

In line with above statement, Transparency International interviewed some businessmen and confirmed the conclusion:

Participants agreed that decentralization has made procurement much less transparent. They noted that many of the provinces and local governments have different procurement regulations, which are not consistently applied. Moreover, on the provincial and local level, responsibility and reporting duties are not very clear. The representative of NPPO noted two problems at the provincial and local level: 1) there are many different interpretations of the procurement rules and 2) there is political pressure to favor certain bidders. NPPO is drafting a national procurement law but it is not expected to become law until 2014 or 2015 (TI, 2011)

**Human Resources, Standard, Private Integration and System**

In Kutaikartanegara and Tangerang, human resources are an important issue that affects the effectiveness of e-procurement. The main difficulty faced by the local governments is the ability of officials of the procurement and the reluctance of civil servants to be procurement officials, and the ability of the provider in information technology (Nitisgabha, et al., 2009). In both regencies, information technology issues are perceived to be influencing factors on e-procurement effectiveness. Interviewing the key persons involved in a procurement unit revealed some important information. On e-procurement policy, they said that:

“We did support the e-procurement policy to prevent corruption at our local government. You can see that our budget expenditure involved an increase of use of the e-procurement mechanism year by year”.

Head of Procurement Unit in Tangerang city said that:

Our challenge is how to get a good provider according to the real administrative condition that they upload in the e-procurement site. So, the problem is the proof of their documents in procurement process.

This means that e-procurement systems do not guarantee governments will get good private providers.

**Infrastructure and Small Medium Enterprises in Riau Island Province**

As mentioned in Chapter 4, one of the difficulties in doing Indonesian e-procurement is diverse infrastructure conditions from one island to another. In the variable significant test, infrastructure, standardization, private integration and system e-procurement were related positively to the dependent variable. The most challenging e-procurement in Riau Island Province is electricity supply that often causes problems in the procurement process (Interview, on 9 November 2013). Electrical conditions frequently lessen the performance of e-procurement in the new province in Indonesia. The procurement officials said that the system often suffered damage and inhibited the process of auction. In addition, the systems integration factor became a problem, which is important for the implementation of e-procurement, since the absence of the same standard in e-procurement system and the lack of good monitoring of the NPA cause serious problems. One of the problems faced is data about blacklisted companies

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which can still participate in e-procurement and construction project bidding. For example, in the fiscal year 2013, PT Persada Pillar won the construction of the Building of Malay Culture.

Another issue in e-procurement is the open competition between local companies and incoming companies from other provinces. The Head of Construction Development Institution stated that province and city/regency government should prioritize local companies to win local government project (Interview, 21 November 2013). Similar to the Coulthart (2001) findings in Australia, e-procurement had serious effect on small and medium enterprises’ access to local government projects. Because e-procurement project had the lack of strategic direction it is also shown in the insufficient attention to the stated objective of increased SME access or e-Commerce adoption.

In sum, we can see that the decentralized e-procurement system in Indonesia may make the different epics of a story depending on the conditions of its locality. Yogyakarta city and Tangerang city have more advanced governance practice (at least based on the indicators of their achievement on financial audit report awards and procurement awards) face the more advanced issues regarding with human resources, regulation and private integration system. In the other local government, Riau Island Province (and maybe other local government) faces difficult infrastructure conditions. Actually, the e-procurement position and condition in a decentralized-system are relatively independent of the concurrent local governance; they follow primarily from the nature of the policy, infrastructure, leadership, human resources, and private readiness. As noted earlier, the relationship between National Procurement Agency and Local Government Procurement Agency is missing link. The main task of NPA is to supervise the local government procurement, but has not authority to impose sanction. Thus, the performance of local governments’ e-procurement is determined by the local government itself.

E-Procurement and Corruption

Concerning decentralized e-procurement implementation in Indonesia, we found that there are forty reports (40) on e-procurement research. This number is certainly not able to represent a large population. By taking into account that the early implementation of e-procurement in Indonesia most recently started in 2012 so we can realize that the number of e-procurement research is still limited. However, at least we can get an overview of the extent to which e-procurement which had been implemented in diverse of time and the model in various agencies of the central government and the local government that might encourage a decrease of corruption of goods and services procurement. By reviewing the trend of increasing number of e-procurement units, only 11 units established in 2008, 63 units in 2009, 274 units in 2010, followed by an increase of approximately 300% in 2001 when the total number of units was 630, and then doubling in 2013.

Fig.2. describes how the public e-procurement technology performance can help to reduce corruption in forty e-procurements. Ministry of Finance, Jogyakarta City, Tangerang City and Surabaya City are four interesting examples to increase transparency and accountability in public procurement. The city of Surabaya, the first city to implement e-procurement, awarded the recognition from the Anti Corruption Agency (KPK) of the succeeded city in preventing acts of corruption through the procurement of goods and services. In 2007 the agency conducted evaluation research on the e-procurement implementation found that:

1. The embryo of the first e-marketplace in Indonesia is used by more than 3,450 Vendors and 43 units in the government city of Surabaya. It recorded a daily average of 50,000 web hits and 82,395 visitors, with many packages being auctioned and all packages above 50 million transacted through electronic procurement.
2. In 2004, the auction process as much as worth Rp. 182,86,661 billions.
3. In 2005, the auction process work packages worth Rp. 1603,413,38 Billions
4. In 2006, the auction process as much as worth Rp. 290 Billions.
5. In 2007, until May 2007, the auction process as much as worth Rp.350 Billions worth of 196.28 job package.
6. The best model of Government e-Procurement Service could be implemented in central and regional government agencies. The e-procurement service obtained the ISO 9001: 2000 Quality Management System ISO 27001: 2005 and Information Security Management System. The impacts of the e-proc implementation in Surabaya are as follows: a) the reduced budget corruption opportunities; b) increased employment opportunities to young entrepreneurs; c) increased budget efficiency; and d) increasing public trust on public procurement.

However, most of e-procurements that had been studied were to achieve efficiency and faster and easier processes of procurement rather than transparency and accountability. This is supported by Independent Monitoring Commission (LPI) in Makassar commission’s findings were able to detect “sophisticated” practices

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b : Professor of Korea University
implying collusion, such as subprojects with different types of work and locations bundled into a single package (seemingly to limit competition), bids with simple mistakes in their cost proposals (so the company would knowingly be disqualfied, and the perception of more bidders would be inflated), and proposals that added items beyond the scope of work (and hid these unneeded additions by lack of detail in quantities and costs) (E. Rahman, 2012). Commissioners also found two bidders for a contract that had the same owner. Through its field network, LPI was also able to identify problems in contracting, such as road segments not built to specifications, volumes of supplemental food not delivered, substandard school furniture, and contractors receiving their final payments before completing work. The mayor responded to these reports by calling together department directors and pressing them to follow up on the findings. Encouragingly, the Department of Public Works heeded the call and negotiated with contractors to finish faulty infrastructure projects.

Fig.2. Anti Corruption Factors of E-Procurement

There have been 40 studies done on e-procurement conducted in forty different government organizations. Those researchers revealed that the automation (in terms of procurement process automation) has been the greatest result achieved, followed by a decrease in unnecessary costs associated with paper, and increased competition because all parties from outside the region can compete in becoming a supplier. Kusuma (2012) and Pujiati (2010) studies found that e-procurement system applications in private/government firms has a positive effect on time efficiency. 76.7% government/private firms are categorized in the fast category in access to e-procurement sites. The ease in access to e-procurement sites is a primary advantage of conducting goods/services transactions online. E-procurement systems managed by government/state firms give goods and services supplies processes good security for related relations.

As mentioned by Bawono in his research that the procurement committee agreed that e-procurement of goods/services was more efficient than before committee said that 85% (pre tenders), 83,75 (tenders),% and 86,56% (post tender) and providers stated that e-proc making to be more efficient of 74,86% (pre tenders), 66,73% (tenders) and 73,68% (post tender) (Bawono, 2011). Another investigation showed that e-proc can accelerate the auction process. The number of auctions completed less than 45 days was about 50% of the whole package which was announced via the E-Procurement System. The percentage of total auctions completed between 45-60 days is 26% while beyond day 60 the percentage was 23% (Sumadijaga and Pujiono, 2011). E-proc also increases competition, as demonstrated by Mulyono's study in Pontianak. Construction project bidding done by Public Work Agency in Pontianak City can easily be followed by all construction companies in the city of Pontianak by utilizing the e-proc services (Mulyono, et. al, 2011). This study analyzes the implementation of e-procurement policy in PLN for realizing efficiency and transparency, as well as the problems which are encountered in the implementation of e-procurement (Rahayu, et. al, 2011).

Interestingly, the procuring game was redefined after e-procurement implementation in Yogyakarta city and Tangerang city. Information asymmetry was reduced by information technology. Interest groups, associationsof

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b : Professor of Korea University
companies and media now had access to procurement process and could use this information from website to push for a more transparent process. The Head of the Planning Agency in Tangerang City said that:

"After implementing e-procurement, we (budget-owned agency) could not control whom the bidding. Because, the procurement agency is a very independent unit that we could not interfere with. And also the all bidders could look at the procurement process from the e-procurement website. Before implementing e-procurement, the budget-owner agency had the bidding winner, therefore procurement processes were the only justification for it."

The head of the Procurement unit in Tangerang city stated that:

Through the e-procurement mechanism, it is difficult to intervene in procurement decision making processes due to all steps being recorded. It is too risky to change the decision because NPA systems are always connected with Tangerang’s e-procurement site. In the early implementation, local politicians tried to intervene in the procurement process, but they could not do it. In the end, they supported the e-procurement process.

These statements of Tangerang city officials confirmed that there are some external environmental factors importantly affecting the “local politician behavior regarding the procurement process”. Those factors are local politics in Tangerang and Yogyakarta. The following interview was done with local politician of Yogyakarta council below:

“We, as a local council institution, only had political control on procurement process. Legally local council members were not permitted involving in goods and services purchasing. In Yogyakarta, local councils could not intervene with procurement process due to intense public watch dogs”

The political positions of NGOs may be strong in Yogyakarta Special Province and can face head-to-head to local parliament. The strong institutions of society are also indicated by the survey results from Partnership Indonesia in 2012. The interaction of the arena is already well underway. It can be concluded from the communication between the arena that the process is going well and the availability of forums that bring together representatives has the functions of each arena. The forum is between the local council and the bureaucracy, the government and the community, the government and the economic community. The forums were convened on a regular basis in an effort to absorb the public aspirations for policy makers. Even though there was high public participation in the forums, it was unfortunately considered an ineffective method. The forums were attended by under-represented groups (IGI, 2013).

The principle of transparency in the province of DIY is better than any national average for all arenas. The bureaucratic arena has the highest index value, i.e. 9.09 (very good), which is higher than the national average of 5.05 (enough). The government area followed with a 7.97 value (good), which is better than the national average on 4.58 (tend to be bad). As for the arena of civil society and economic community, both have the same index value i.e. 6.40 (tend to be good), both higher than the national average at 6.28 (likely both) in civil society arena and 5.80 (enough) in the economic community arena. Meanwhile, according to Mohammad Faried Cahyono-DIY IGI Investigators said that DIY gained value at 6.80 and was above the national average: 5.67. This means that the good performance in principles of transparency, accountability, participation, fairness, effectiveness and efficiency in the arena of government, bureaucracy, civil society, and the economic community. One of bureaucratic transparency achieved a value of 10. Another factor assessment is the ease in accessing public documents through the official government website.

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b : Professor of Korea University
Indonesia Governance Index (IGI) defines governance as the process of formulation and implementation of rules, regulations, and development priorities through interaction among executive and legislative branches and bureaucracy with participation from civil society and economic society. IGI is aimed at measuring the performance of the government (political office), bureaucracy, civil society, and economic society against certain principles of good governance, namely participation, transparency, fairness, accountability, efficiency, and effectiveness.

The case of public procurement exercising control over agents is much more complicated. Firstly, there is no homogenous group of principals to monitor the actions taken by the agent. Instead there is a diverse collection of principals, composed of interests represented by pressure groups influencing politicians and the general public. The first consists of ex ante measures, which will often take the form of administrative procedures integrated into the domestic public procurement regulation. The second takes the form of ex post oversight, which will be mostly external to the procurement regulation and consist of ministerial control, the existence of superior authorities or commissioners and judicial review (Sourdy, 2007). In Yogyakarta Special Province, Local Ombudsman Institute acts as an oversight control institution to control the procurement process through information technology.

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Fig. 3. Provincial Governance Index 2013


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b: Professor of Korea University
However, political commitment to health and education budgets was the lowest compared to other provinces. Those showed the ratio of girls to boys, and it shows that in the special region of Yogyakarta (DIY) girls receive only 8.6 years, whereas the minimum requirement for compulsory education is nine years, and the health budget allocations per year are only IDR 5,807 per resident. This fact is contrary to the magnitude of the operational costs of the bureaucracy, i.e., overhead at DIY is about 96% of the cost of the total program. As a consequence, the principles of fairness and efficiency in the arena of government get the lowest value when weighed against other principles.

The results of the IGI assessment of all provinces in 2012 show that the average score for the performance of the provincial governments in transparency is considered Poor (4.58) with a slightly better score for performance of the Bureaucracy that shows a Fair score of 5.04. The scores indicate problems in accessing public information such as non-confidential government documents - in most provinces in Indonesia. Fig. above reviews the gap between accountability and transparency in Riau Island Province.

Another analysis on Yogyakarta and Tangerang local politics concerns whether the competition amongst political parties in local councils is high or low. The most important indicator to measure the degree of competitiveness is the holder of the executive wing and the legislative wing. There are two types of local government in the current local government in Indonesia, namely the divided local government system and the unified government system. In the divided government system, the mayor/regent/governor is from one party, but the majority of local parliament is dominated by another party. In the unified local government system, the mayor/regent/governor is from the majority party holding the local parliament. We assume that competition amongst politicians in the divided local government system is stronger than in the unified one. What is the effect of political competition on procurement process? If competition between political parties and between councils is effective, then local service producers may already be highly efficient (Boyne, 1998).

In Yogyakarta city, Haryadi Suyuti - Imam Priyono (mayor and vice mayor) nominated by Indonesia Struggle Democratic Party (PDIP) and Golkar Party won the popular vote at 48, 34 percent (42.5% in city parliament) defeated Hanafi Rais - Tri Harjun Ismaili (Fiti), mayor candidate of National Mandatory Party (PAN), Democratic Party (PD), United Development Party (PPP), Gerindra Party Hanafi Rais - Tri Harjun Ismaili (Fiti). Meantime, in Tangerang city, mayor candidate Wahidin Halim and Arief Wismansyah supported by twelve political parties: Partai Golkar, PDI Perjuangan, PPP, PAN, PKPB, Partai Demokrat, PDS, Partai Bulan Bintang, and PKNU won popular vote at 72.73%. In fact, the thesis of political competition is not valid in two city cases because Yogyakarta and Tangerang city classified as an unified government system.
Riau Island Province Procurement: The Dynamic Local Politics

The Riau Island Province, with Tanjungpinang as the capital, is the newest province of Riau Province. Its territory includes 2 cities and 5 regencies. Tanjungpinang City, Batam city, Karimun Regency, Lingga Regency, Natuna Islands regency, and Anambas Islands Regency. Administratively, Riau Province has 39 districts and 351 sub-districts. Its area of 251,810.71 km² is dominated by sea, which consists of 241,215.30 km² (95.79%). The remaining 4,110,595 miles (4.21%) is land that is spread out among the 366 large and small islands, of which 40% have not yet been named and populated. Among the thousands of islands, 19 of the outermost islands are directly adjacent to the other country (Malaysia or Singapore) that is prone to security issues, social welfare issues, and environmental sustainability issues.

From all over the arena or governance aspect, the application of the principle of transparency of the Bureaucratic Arena only amounted to 2.34 (bad). While the highest index was obtained by the Government Arena in applying the principles of efficiency getting score on 8.19 (good). The research showed the index governance of Riau Island Province value to be 5.60 (enough), which is 0.10 lower than the national average index whose value is 5.70. Riau Island province's index value placed it at the 24th position out of the 32 provinces. The bureaucratic Arena's lowest index was of 2.34 (bad), which is earned in the transparency category. This index is big gap from the national average of 5.04 (enough). The highest index was obtained by the Economic Community Arena, at 5.50 (enough). If compared to the national average, all arenas in the province had a lower index of the principle of transparency (IGI, 2013).

It is interesting to look at the configuration of the local politics in terms of political parties winning the general elections in 2009. Of the 45 seats in the local parliament, the Democrat Party and Golkar Party each gained control of 15.56% (7 seats), the PDI-P and the PKS have each 13.33% (6 seats) and 11.11% (5 seats), the PPP has 4 seats (8.89%), Partai Indonesia Baru has 3 seats (6.67%), and the Hanura get two seats or 4.44%, and the other five parties have 1 seat each. In other words, province of Riau Islands controlled politically by the Partai Demokrat, the Golkar party, PDI-P and PKS. Meanwhile in the executive wing, the Governor and Deputy Governor, Mohammad Respationo and Sani Soerya, candidacy of the PDI-P won local election vote after getting 23.2% of the vote from 621,847 votes in the 2010’s election.

In some local governments of Indonesia, a bigger representation in local parliament means more political power in controlling their local budget. Thus, the point to be emphasized is that the decentralization process in Indonesia has largely been hijacked by special interests that have little to gain from local governance characterized by greater accountability to local communities, transparency, and the like (Hadiz, 2011). Therefore if we analyze e-procurement implementation as a policy execution, it is better to explore theoretical frameworks rather than technical ones (technocratic one) in terms of information technology as such. Vedi R Hadiz (2011) tried to look at the weaknesses of neo-liberal approach in decentralization policy. Hadiz (2011) moreover said that decentralization is unlikely to produce the kind of technocratic ‘good’ governance idealized in the neo-institutionalist scheme. This is most vividly illustrated by the rise of political gangsters and thugs perhaps the ultimate in predators in the leadership of parties, parliament and executive bodies at the local level (Hadiz).

As mentioned in the before, the capture theory tries to look at elite behavior regarding scarce economic resources. Pearson (2010) mentioned that researchers and policy makers now seem to agree that the failure of contemporary anti-corruption reforms are not so much the result of a lack of resources as of the absence of stakeholders including government, civil society, non-governmental organizations, and ordinary citizens willing to act as “principals” and, as such, to enforce existing laws and policies (Riley 1998; Robinson 1998; Kpundeh 1998, 2004; Johnston 2005; Amundsen 2006; World Bank 1994). Early studies took a pessimistic view of the potential of collective action to overcome problems, such as elite capture. As a prevention policy to curb corruption, in e-procurement implementation, all actors could have roles as principals. The public, for example, play both an agents and the principals in term of oversight control.

Referring to collective action theory done by Mansur Olson, the analysis on the dynamic relations amongst actors is very interesting to address. Mansur Olson (1965) theorized that groups of individuals with a shared interest will not act on behalf of that interest. Rather, he posits that since ‘members of a large group rationally seek to maximize their personal welfare, they will not act to advance their common group objectives unless there is coercion to force them to do so’ (Olson, 1965: 2). According to Olson, the problem is that there is no incentive for all to share the cost of collective action. Instead, he argues, each member of the group prefers that another member pay the entire cost hence the ‘free rider’ problem. Olson does concede however, that small groups are not only quantitatively, but qualitatively different from large groups, and that with smaller groups the free rider problem is reduced. Moreover, Ostrom’s (1990) work takes issue with the conceptualization of the free rider problem and other difficulties associated with collective action. Where previous analysts had limited the possible responses to the

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collective action quandary to either control by a strong central government or regulation through a system of private property rights, Ostrom presents a third option: individuals can have agency to create their own agreements, institutions and systems of management, which have the capacity to change over time and prevent tragic outcomes. Through a series of case studies of small-scale common pool resources (CPRs), Ostrom examines how in various contexts a ‘group of principals who are in an interdependent situation can organize and govern themselves to obtain continuing joint benefits when all face temptations to free-ride, shirk, or otherwise act opportunistically’ (Ostrom, 1990: 29).

By using the Ostrom’s model, it may assume that the local politicians, bureaucrats, and private companies in Riau Provinces organizes and govern themselves to obtain benefit from “e-procurement” regulation. They did preparation from the budget planning until project procurement announcement in site.

In Fig 5 above, there are some actors who have an interest in local procurement. Mayor/regent/governor is the key person who has authority to use the local budget. Under his/her leadership, she/he proposes a budget draft to the local council in order to get the council’s approval. The budget debate in the local parliament normally occurs from August to November every year. In the discussion of the budget in the local parliament occur politician budget proposed by members of parliament to executive partners. If it is not approved by the executive, the parliament will not approve the proposed budget plan. The process of corruption at the budget planning level is publicly known in the Riau Islands province. TheGetuk, a corruption watchdog organization in Tanjungpinang, found the seminal case as follows:

There were two local parliament members, Ricky Faisal of Golkar Party and Iskandarsyah of PKS party, who were alleged to be middlemen in the Education Agency and the Health Agency, Riau Island Province. Therefore, the e-procurement mechanism was only a justification to meet the procurement rule. YusriSabri, an anti-corruption activist said that he had strong evidence to prove his allegation. He added moreover that those agencies, private company providers, and local parliament members collaborated to arrange a billion rupiah project. Even YusriSabri said that a private company had provided Rp. 600 million for success fee of Rp. 13 billion’s project (Batancom, 2013/October 16).

Another investigation done by Suparman, the Head of Local Transparency Organization, Batam City, promulgates the other case. This case shows how the e-procurement process is designed to guarantee a winning candidate through violation of procurement procedure.

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A maintenance road project in Batam was announced through e-procurement site. But, the bidding document on October 13 2012 had never been done by the procurement committee. Bidding evaluation occurred on 30 October 2012, the same day the bidding document was opened. The bidding document could not be downloaded or uploaded through the e-procurement site. And the objection period from 2 November to 7 November 2013 was unavailable. Suparman alleged that PT. Paten Agriutama as a project winner being get early agreement with procurement committee to win the project. In the project implementation, the road cement did meet the required specification of cement quality. (2013/February 2, Bakin News).

Those cases revealed that e-procurement in remote areas and the far-reaching control of NPA is facing transparency problem. Through public goods and services purchases via e-procurement, all actors organize themselves in order to obtain their interests. This will, however, also simply a simplification of the opportunities for corruption (Soreide, 2002). Again, confidential information is an attractive commodity, in many cases worth a significant bribe (Soreide, 2002). Pearson, et al (2010) also found in Kenya and Uganda that the collective action problem of corruption is not as one sided as it may look. Even actors higher up in the hierarchy such as low-level public officials and political elites seem to feel a pressure to passively support the corrupt game rather than actively taking part in it for their own private, absolute gain.

Business deals in e-procurement may be happened in which a private company tries to lobby budget officials and procurement officials and get political support from politicians in local parliament. In turn, they lobby procurement committees in order to win the bidding. (Interviewer P.3. Nov/2013/14)

The absence of standardized monitoring also occurs at auctions in the case of Batam Agency in Riau Islands. In the case of auctions that occur, the decisions of the committee are not obeyed by the owner's budget official, so the auction was won by one of the companies which was not running. There are indications that the desired second-order functions from official commitments. Corporate winners then asks the claim to owner official but is not addressed properly. In this process it can be said that there is no system of control and monitoring from the NPA, so there are many cases of irregularities in the procurement of goods and services via e-procurement which are not resolved.

However, the survey of the Anti-Corruption Agency (KPK) on corruption prevention revealed that the role of the community in the prevention of corruption is quite low. Certainly, every government unit generally delivers the media and complaint mechanisms in optimizing customer satisfaction. Of 1125 respondents, only 45.8 percent of service users know there is a media complaint, while 10.2% of the service users had complained (KPK, 2012). Moreover, the respondents were asked about their actions on corruption, which revealed that there is variation in answers as follows:

- a. Not doing anything without any reasons.
- b. They felt that they did not have authority to do and they felt useless.
- c. Not doing anything and just to pray.
- d. They did not do anything, because they did not care. They said there was some institutions that dealing with.
- e. They did not do anything, because there were too few of them.
- f. They did know what to do and to whom to report.

Conclusion

The fact above shows that some anti-corruption policies under the principal-agency theory is a failure of reforms or are also not so much the result of a lack of resources as of the absence of stakeholders including government, civil society, non-governmental organizations, and ordinary citizens willing to act as “principals” and, as such, enforce existing laws and policies (Pearson, 2010; Riley 1998; Robinson 1998; Kpundeh 1998, 2004; Johnston 2005; Amundsen 2006; World Bank 1994). In decentralized procurement of Indonesia, public participation is very important to prevent the misuse of local budgets. Decentralization may be particularly successful where there is local capacity and high levels of participation (Hanna, 2011). Decentralization can reduce corruption by bringing the accountability for program implementation to the effectiveness of anti-corruption policy.

Lack of public knowledge on the procurement of goods and services is likely a common fact and even some of those who are still considered the winners of an unworthy company are commonly accepted. A survey conducted by the Anti-Corruption Agency on public perception of corruption found interesting findings especially with regard to goods and services procurement. Responding to the whether the act of public officials as procurement a,c,d,e : Reseacher of Jusuf Kalla School Government of Universitas Muhammadiyah Yogyakarta 
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committee in winning the their closed-family company despite the offer not the best, 20.9% (in a 2010 survey) and decrease to 16.7% (in a 2011 survey) of respondents said this was not corruption and 6.58% (in a 2010 survey) and increased to 11.2% (in a 2011 survey) of them did not know (KPK, 2011).

Similarly another finding on gratification in the procurement process shows the degree of public awareness on corruption. In both the 2010 and the 2011 survey there were 52.5% and 52.7% of respondents which said the gratification in procurement process was not corruption. 32.2% of respondent said they did know of any corruption or conflict of interest in procurement process (KPK, 2011).

Having more information on different perspectives on public awareness on potential corruption in procurement process, we can summarize a different story, in either a success story or a failure story of e-procurement to prevent corruption. Certainly, Riau Island Province, the newest local government, the public participation and public capability in public policy is still developing and immature. This province needs time to build its community capacity.

A crucial question arising is whether, there been significant sub-national variation in the e-procurement implementation, we are witnessing the better performance of local government in doing e-procurement project. By observing three cases of procurement above, we try to build the theory of joint project between central government and local government is built on a simple model of local implementer, which I capture as a repeated prisoner’s dilemma game between a central government as an enforcement agent and the implementer (Osborne, 2000). The presence of a strong local government policy to e-procurement will not in itself secure implementation. In other word, the local government needs to secure support from the central. However, if the central government remains indiscipline then prosecution is much less likely and dependent on the extent of local government discipline.

<table>
<thead>
<tr>
<th>Central Government Discipline</th>
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<tbody>
<tr>
<td>Weak</td>
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<td>Weak</td>
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<tr>
<td>Strong</td>
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<tr>
<td>None</td>
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</tbody>
</table>

Figure 6 captures this game with static payoffs; it shows that in a one-shot game both players will obey and receive but that they could neglect. This simplifies the dynamic formation of local government and central government alliances by assuming that the game is played. Each of government can either discipline or neglect in term of President Instruction on e-procurement implementation. If central government do discipline way then local government prefer to neglect.

<table>
<thead>
<tr>
<th>Implementer</th>
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<tr>
<td>Discipline</td>
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<tr>
<td>Discipline</td>
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<tr>
<td>Ambivalent</td>
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Public ICT Procurement:
Maximising Quality Whilst Minimising Risk

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Introduction
The UK Government published its new information and communications technology (ICT) strategy in March 2011[1]. However, it did not make a great deal of reference to the key subject of assuring the quality of software that is either procured or acquired by the Government. The authors view this issue as critical for success, and they had first highlighted the associated risks, and how they should best be addressed, to the UK Government in 2006, when they had met with senior civil servants. Their focus was the integration of the assurance of software quality into public sector procurement processes. Further meetings took place with senior representatives of the Government Procurement Service in 2012 which resulted in their being invited to submit independent “Third Party Guidance” which covered both the available procurement process options and the technical issues and opportunities (drawing on lessons from Industry). The guidance was submitted in February 2013, and after due consideration, it has now been circulated to Government teams that have an interest in this area, including the Government Procurement Service itself.

This paper summarises why the integration of the assurance of software quality into public sector procurement processes is important, and the “Third Party Guidance” submitted. The latter divides into two components: Technical aspects and Procurement processes. It is considered that the guidance is applicable to other countries as well as the UK.

Software Quality
The public sector has an unhappy history in relation to the successful introduction of computer systems, with examples in the National Health Service (NHS), Defence Infrastructure, Benefits and other departments [2]. Whilst procurement processes place responsibility for the efficacy of software squarely with the providers, failures still occur[3].

A basic premise in the purchase of any artefact is the balance between price and quality, with the general rule (assumed) that the higher the quality the higher the price. Yet the particular problem for information systems is that there is usually no discernable quality assessment visible to either the purchaser or even the provider.

There are industrial standards to ensure process quality for both hardware and software. The software component of any system is usually the most problematic, in part because there are a number of different, existing standards. These vary from the largely arbitrary and advisory (e.g. Carnegie Mellon Software Institute’s Capability Maturity Model, Level Five (CMM5)[4]) to the prescriptive (e.g. Avionics’ DO-178b[5] and Electro-technical’s IEC61508[6][3]). In addition, the Motor Industry Software Reliability Association (MISRA) has a range of programming standards[7]. (It is worth noting that MISRA was a UK Government-funded initiative, which has now been adopted worldwide).

CMM5 has been used in the procurement of public sector systems, but CMM5 requires an entire organisation to be focused on continual process improvement, i.e. it has the means to identify weaknesses and strengthen processes proactively, with the goals of preventing defects and improving efficiency. However, this is not the same as requiring affiliates to show that their software is free from defects and faults: it simply requires a reduction of
defects from previous CMM5 levels to be attained. This falls short of what is required, and so greater emphasis should be placed on the level of criticality involved in systems[3].

Industries where criticality is paramount are avionics and the nuclear industries. For example, what are the potential implications for an aeroplane full of passengers flying at 30,000 feet when the software goes wrong? It is not really practical for the pilot to send an email to the software provider to ask for something to be done as soon as possible. Criticality is central where software failure can be life critical, and relates to equipment as well as systems. Therefore, the efficacy of software standards in these sectors is paramount and the assurance and audit systems that are put in place are aimed at ensuring that software works first time and every time. Imagine if the same approach was applied for the public sector?

“Criticality” for public sector systems can be described in three levels:

- Safety Critical: (E.g. New medical technologies (e.g. pacemakers); Gamma-rays for cancer)
- Safety-related: (E.g. Air traffic control/ Ground systems; Navigation systems)
- Mission-critical: (E.g. Information systems for NHS and Social Security) [3]

In addition, there is the implicit “criticality” requirement of security; it is essential that software systems do not have vulnerabilities, or other weaknesses, which will enable unauthorised access to data or other systems. These four criticalities can all be addressed by quality assessments of software.

The two examples of prescriptive standards, quoted above, manage the whole of the software life-cycle and have a very successful track record. They are both mainly directed at process quality, although they do have some product quality components. In particular they both specify objective success criteria for the testing process. This means it is known how well-tested a system is, and if this is not good enough then what must be attempted next (in relation to the relevant criticality levels).

Quality arises from three sources: people, process and product. It is arguable that when the people factor dominates the result is “Art”. It is considered that the ICT industry has dragged its heels on the issue of qualifying people, and there are concerns at a lack of computer programming skills in the UK[8,9]. The situation is exacerbated by the fact that most computer professionals are poorly educated concerning quality issues. It is therefore concluded that future public sector ICT systems will carry risks relating to the quality of software, unless an appropriate approach is taken.

**Taking Advantage of Current Processes**

Given the above situation in respect of software quality, Government staff will have little or no idea of the (real) impact that requested changes to a procured ICT system’s specification might have. Consequently, when changes are inevitably requested, software companies are able to use these as an excuse to make extra/ additional charges, and Government staff are in a weak position to argue.

Therefore companies can sometimes submit artificially low “bid” prices, in order to get the contract, knowing that they will recoup money when the inevitable specification changes arise.

Also, it is believed that Government-related work has a mark-up premium. An example of how such a premium is in operation is the fact that in the USA healthcare/ hospitals are private, and therefore independent. Hence computer companies have to be genuinely competitive with one another in respect of quality and price, in order to get business, with the inference drawn that prices are cheaper.

**Quality Assurance of Software**

Software product quality assessment is an area where the UK has a particularly strong commercial presence. For example, the product quality for the F35 Joint strike fighter of the USA and UK is principally assured by British manufactured tools. The same is true of the Chinese Space Programme.

The issue of how appropriate the proven techniques of such companies are to more general software is the subject of debate. That they can definitely be applied is beyond question, because commercial companies have already applied them, on their own initiative, to banking, finance, telephony, data bases and medical systems. There are no technical arguments against their use, the arguments are purely commercial.
Some commercial arguments claim that an increase in quality can be achieved only at an escalation in cost. The escalation in production cost is claimed to be prohibitive. Two factors can be considered in response: firstly that the cost of the current production process - which frequently leads to failure - is already very high, with final costs always significantly above those originally quoted or estimated; and, secondly that with modern automation techniques the escalated costs are actually marginal, and may in the end prove significantly less than the current costs.

The principal reason why commercial interests exaggerate the costs is that they do not have the requisite expertise either in their management structures or their personnel. It is also true that the small organisations which do have the expertise of working to rigorous standards do not have the expertise to build large systems.

**Independent “Third Party Guidance”**

The independent “Third Party Guidance” submitted by the authors to the UK Government divides into two components: Technical aspects and Procurement processes. These are set out below.

**Technical aspects:**

Whilst Government is pursuing an ambitious ICT strategy aimed at supporting and improving public services[1], at the same time it will seek to avoid the well-known historical problems relating to Government Acquired Software (GAS) that have occurred in the past. Such systems have not functioned according to expectations and their reliability is often inadequate. In this context reliability means the ability to perform the tasks required by the users in a timely, convenient and accurate manner.

It is strongly contended that one of the main contributory factors to the problems experienced with GAS is the efficacy and quality of the actual coding of the software. This guidance provides advice about how best to address and eliminate coding quality problems so that high standards are maintained, and new GAS systems are successful. It looks at some of the issues relevant to GAS and makes recommendations which are general in principle, practical in nature and cheap (for Government) to implement.

**Perceived Causes**

The causes of the problems are many and varied. In the distant past the blame was attributed to civil servants who were said to be unworldly and inexperienced, and who imposed their blinkered view on society. The answer to this offered by the ICT industry was ‘leave it to people who know what they are doing’. In reality not much changed. The causes are much deeper.

An unfortunate by-product was that Government reduced the number of appropriately qualified civil servants.

Today there is the perception that avaricious ICT suppliers fool the naïve civil servants and Government ministers. This view is also too simplistic although the principle of exploiting the Government still persists.

**Root causes**

Most modern software systems are large and highly complex and this has actually been true for some time.

At the formulation of a new project those developing the specification rarely see the full extent of the complexity. Their view is dominated by the anticipated high level functionality of a proposed system. As requirements are drafted and expanded in greater detail it usually becomes apparent that there will need to be mechanisms to cope with faulty inputs, incorrect assumptions, inadequate responses, and so on. The processing of these bolt-on protective and corrective actions (PCA) gets steadily more complex as the system is developed. In large systems the mutual interactions of these extra processes can themselves cause massive complexity problems.

The single most influential factor in causing unwanted PCA interactions is the changing of requirements. A change in requirements rarely leads to a global review of the impact on the PCA. Unfortunately, system builders can fail to appreciate the incredible stupidity of some users of IT systems and the potential impact of their actions. An example of the latter is the China Airlines Airbus flight 140 crash in Japan where the pilot was so determined to land the aircraft that he fought the automatic go-round system which he had himself (unknowingly) selected[10]. The subsequent crash killed 264 of the 271 people aboard.

The software industry has long known that faulty or inadequate requirements are a major cause of software-based system defects. Whilst requirements analysis[11] has come a long way there is still no general means of ensuring
that there are no missing, misunderstood or unnecessary requirements which could adversely impact upon a complex system.

Faulty Assumptions

One the most common solutions or partial solutions proffered to address the problems is that using tried and trusted systems as the basis for new systems will lead to more reliability. The reason why this is too simplistic is that the perceived reliability of software systems (the users’ view) is highly dependent on the patterns of use. The best example of this is are some popular commercial off-the-shelf (COTS) word processing packages which are extremely reliable when putting together a simple document, but can be extremely unreliable when handling large documents with many changes of font, colour and layout. Unfortunately the pattern of use of software is rarely measured or evaluated, and so the inclusion of tried and tested systems can be extremely risky, or at best the risk is unknown.

The current direction of Government procurement for ICT is to build around, or with, COTS systems because they are cheap and are believed to be reliable. It is this last claim, which can be untrue in specific circumstances, that is likely to lead to future problems. Without reliable measurement of patterns of use there can be no certainty and the consequences for a wrong or inappropriate assumption are entirely unpredictable.

Potential Solutions

There are potential solutions to the problems facing GAS and some of these are discussed below:

Contractual mechanisms.

This involves the use of a procurement contract that clearly and unambiguously states the obligations and responsibilities of the system supplier. This enables Government to demonstrate that the blame for system failure lies with the supplier who can then be sued. Whether suppliers will accept such a contract is problematical, the biggest problem being that the supplied system will still be faulty and fail to perform the tasks. The users of such a system are unlikely to take comfort from the apportionment of blame.

Requirements freeze.

Since many of the problems which arise are attributable to changes of requirements then there comes a point beyond which changes are not allowed. The consequence of this constraint is that the resultant system will be dated and suffer from inadequacies. Nevertheless, what it does do might be done (very) well. Systems built with this constraint are almost all in the Avionics domain. Governmental software, subject to changes in legislative alterations might be harder to treat this way.

Wrappers.

There is a school of thought which believes that unreliable systems can be made reliable by means of a wrapper system. This is some software which filters the inputs and ensures that the only permitted inputs are within the patterns of use which are regarded as reliable. The success of this approach depends on knowing the acceptable patterns of use and being able to distinguish the others. As mentioned above, there is rarely available data and making optimal decisions can be difficult.

Agile techniques.

The premise is that complex software systems can be generated quickly and easily using automation techniques. Thereby a system can be generated quickly before requirements change, and then if faults are discovered a ‘fixed’ system can be quickly regenerated. Similarly if new requirements do arise then again the enhanced software can be quickly generated. The software industry has a long history of ‘magic bullets’ which subsequently prove to be largely ineffective and there is a possibility that this is another.

So-called ‘Agile techniques’ impose a specific structure on a software system. The ability to make changes to the software (in response to changing requirements) depends on how the current structure impacts on the new structure required to accommodate the changes. The technical term for this effect is “structure clash”.

Agile techniques may make it appear simple to change a system in response to changing requirements but it may not be simple to retest the new system. Some purveyors of Agile techniques have been known to solve this issue by intimating that retesting will be unnecessary. Yet, all the above issues about
requirements completeness and PCA remain unchanged. It may be that only a small number of tests will establish the correctness of the changes or it is possible that the whole system will need to be tested from scratch; it is the internal structure which dictates the difference.

**Fall-back stance**

The fall-back stance in the software industries is to claim that full functional testing will or has taken place. The problem is that it is not known how to quantify or qualify functional testing, and therefore this term can be the refuge of those who wish to be unconstrained. Questions such as “How many functions are present?” and “Which have been tested?” are unanswerable. Neither in general can functions be qualified as to which are important, primary, high level, critical, etc.

In essence none of the above potential solutions is general enough to act as a complete general solution, although all have merits in particular cases. However, they can be applied on a “horses for courses” basis.

**Looking for success evidence**

If a search for established software quality is undertaken, three industries stand out in terms of the consistent, successful implementation of software systems.

1. **Nuclear:** This industry has an excellent record for producing highly reliable software based systems. They are however usually relatively small and tightly constrained by industry-wide standards.

2. **Avionics:** The achievements of this industry are very significant. The software systems are moderate in size and again tightly controlled by industry-wide standards. Large systems are in hand and as yet there is no evidence to suggest that success is not possible.

3. **Telecommunications:** The achievements of this industry are considerable. The software is not regulated by international standards but there has always been a culture of Quality. Much of the early research into software quality was performed by this industry. The industry is known to implement many software standards.

What can be distilled from these industries is that highly reliable software can be produced when the whole process is controlled by rigorous standards. The Automotive and Electrotechnical industries have noticed this and have recently introduced similar standards such as IEC 26262 (which is an adaptation of the functional safety standard IEC 61508[6] for automotive electric/electronic systems). Other industries such as Finance have been reluctant to follow, and this is arguably reflected in some of the problems witnessed in that sector[12,13].

It should be noted that all the above successful industries world-wide heavily utilise software audit and quality assessment tools. Accordingly, the application of software audit and quality assessment tools is an integral part of ensuring the efficacy, and therefore the success of the software.

There are some examples of software produced in the absence of standards which are known to be highly reliable through independent assessments. The open source UNIX operating system is one such example[14]. It was produced initially by a telecoms organisation and has subsequently been modified and extended by a host of enthusiasts. The VMS system is even more reliable, although it is now (relatively) seldom used. Both are much more reliable than some popular systems that are widely-used in the Public Sector.

By comparison, the open source GNU compiler systems which are again produced by an army of enthusiasts are more problematic and opinions vary. Open Source is not of itself a solution.

Whilst there are a host of other software systems (some free or cheap) there have been no systematic efforts to assess their performance characteristics, and this would be a suitable subject for research.

**Industrial perspective**

In the past GAS projects have been much sought after by the software industry. The reason is that they are usually large and highly profitable. In the past, cost escalation was an accepted practice and hence a software house could come to no harm. The problem is that moves to tighter fiscal control have always been offset by the changing of requirements, i.e. the cost escalation arises when the customer requests changes to the requirements (and because they were not part of the contract they incur extra charges).
Up to the present the odium of being associated with failing or inadequate systems has always been avoided by pointing to inadequate requirements (the customer’s fault) or the changing of requirements mid-project (again the customer’s fault).

A movement to a scenario where blame can be applied based on a contract is unlikely to be welcome although the previous mitigations are still likely to be applicable. It is also possible that changes to the requirements will be significantly less welcome than previously.

Way forward

A confrontational environment is rarely a recipe for success, but contracts which are clear and unambiguous in terms of tasks and responsibilities are always preferable.

There are a number of basic blocks to any software systems, e.g. operating system, data base system, communication mechanisms. In a risk-reduction scheme it almost always pays to build on the most reliable basic block rather than the cheapest. Where these quality characteristics are not known they should be explored by means of research contracts. The acceptance of assurances by the manufacturers should not be enough.

Manufacturers are reluctant to either produce quality assessments of their products or to adopt quality standards. However, the onset of security problems is changing this situation: manufacturers are under pressure (from some Governments, particularly the US) to demonstrate that their software conforms to emerging standards for security related software defects. Government should require all suppliers to state the quality standards to which their software conforms. No supplier can afford to ignore such pressures, particularly if the major Governments were to take such a stand. In Avionics it is normal practice for the suppliers of software tools to demonstrate that their products conform to quality norms. There was initial reluctance but suppliers could not ignore market pressures.

Where software is custom built there is absolutely no justification for not insisting (contractually) that the software satisfies appropriate quality standards. Claims that this will infringe intellectual property rights are unjustified. There are large sections of the software industry that already have to demonstrate quality and there is no evidence that their intellectual property rights are infringed.

One option for further strengthening the assessment that software satisfies agreed standards is by ensuring that the attainment of these standards is checked by independent quality assessors. This is standard practice in the Avionics, Automotive and Nuclear industries and has the advantage that the additional cost incurred by Government will be slight since there are many qualified and experienced assessors available.

Ultimately Government should look again at the creation of appropriate standards for software. In the past it has funded standards for the Automotive industry which have been widely accepted[?]. By comparison, the standards developed by the Government-funded Alvey project[15-17] were not accepted by the commercial software industry. It can be inferred that the reasons for the acceptance/rejection of the recommendations of these projects were the motivations of the relevant industries and had very little to do with the quality of the standards themselves. Creating appropriate standards today could be accomplished quite quickly by building on this past work and enforcing the use of the resultant standards (or any applicable standards that already exist elsewhere).

Recommendations

This Technical guidance has briefly examined many of the issues which arise in the procurement of software-based systems by Government. It has looked at many of the claims made about software and offered criticism for many of the claims.

Finally there are a number of ways in which the risks inherent in such systems can be reduced. These are:

- Award research contracts to University-led groups to explore the reliability of COTS software systems.
- Contractually demand independent quality assessments of all procured systems.
- Ensure conformance to software quality standards by the use of independent assessors.

The cost of these recommendations is tiny compared to the cost of failure or even partial failure of Governmental systems. The last two of these recommendations are merely an extension of a requirement that software producers should produce evidence that their products do not have security vulnerabilities which is likely to be a major requirement of the future.
Procurement Processes:

Whilst the Technical aspects described above are all very important, Governments need to ensure that their procurement and acquisition processes relating to ICT Systems appropriately take them into account. Putting to one side the purchase of Commercial Off The Shelf (COTS) systems, there are two main opportunities for acquiring new ICT systems:

The first is through a procurement process, where software companies are invited to put forward submissions to deliver an ICT product to meet a stated requirement. Depending on the nature of the product, each company will be expected to either present how it would develop the required solution, or present an operational solution.

The second opportunity is where a company approaches the Government with a novel ICT product, perhaps already proven in a commercial or industrial environment, which can be adopted where there is a gap in the Government’s existing systems and processes.

As the Government is keen to open up the ICT market with opportunities that encourage small and medium-sized enterprises (SMEs), the question arises about how the Government can assure itself that such companies are able to deliver ICT products that are of the required standard? There is the real danger of a “Catch 22” situation where companies might be excluded from procurement processes, because they do not have the set ‘track-record’, yet they cannot develop the ‘track-record’ because they have not won any Government contracts (or similar). In principle, there could be many companies that wish to submit proposals, and whilst there are the standard financial and corporate checks that the Government might undertake to ensure that they are bone fide organisations, how might the Government check that they have the skills/ expertise to produce top quality software? It would be time-consuming and costly to the tax payer if it were concluded that the Government itself should somehow directly check the efficacy of each interested company’s software. Yet without some such check, the Government will be vulnerable to companies not delivering the quality of product that they promised.

At the same time it should be recognised that ICT products continually evolve, in part to reflect the developing needs of the user organisation. It follows that the Government should ensure that any future specifications should be structured and written in such a way that there is a “core” specification that should not change over time, with scope for flexibility so that additional components/ requirement can be added later, if the need transpires. This would probably require there to be a suitable external interface. Hence the structuring of requirements in a specification is a critical issue.

Way Forward

To ensure that the quality of software is maximised to support the Government’s ICT strategy[1], minimise the risks associated with poor-quality software, and open up the market, it is proposed that interested companies should be required to demonstrate that they meet whatever is set as the requisite standard, in the full knowledge that if they are unable to do this they will not be considered by the Government. How might this be done?

There are a number of options, based on the fact that the quality assurance and audit sector of the international ICT industry already performs this type of function for a wide range of software applications, including aviation and the nuclear industry. This involves relevant software quality assurance/ audit companies checking the efficacy of systems to ensure that the required standards are met. Existing standards usually relate to safety critical systems and safety-related systems, (e.g. DO-178b[5] and IEC61508[6]), and systems with security implications [18], but there is no reason why the Government should not develop or set out equivalent standards for mission-critical systems[3]. Also, some programming standards, such as those from MISRA[7], can be applied irrespective of software criticality.

In all procurements it is assumed that there would be a clear statement as to what minimum level of software standards needs to be met, with a view formed on an ad hoc basis where a company makes a direct approach.

The options are set out below:

Option A: Accreditation Approach

The Government should accredit established, reputable software quality assurance/ audit companies to be able to independently check companies’ software and certificate that set standards have been achieved. This would clearly be appropriate in respect of any existing software that is proposed for Government usage.
Where the Government is seeking to procure the development of a system then companies would be required to show that they can develop such systems. For this, the Government would require that companies achieve appropriate certification for a software system that the company can demonstrate has relevant equivalence to that to be developed.

In this way there is a clear gateway for companies to enter the Government ICT market, and the cost of achieving certification is borne by the prospective companies rather than the Government.

Related course of action:

1. Government sits down with representatives of the quality assurance and audit sector of the international ICT industry to agree classification of software standards that might be applicable for the full range of anticipated systems, together with what might be the minimum standards for each level.

2. Processes are agreed for how accredited software quality assurance/audit companies should certificate software to meet Government’s requirements. (For example, certification may only be deemed valid for a set period).

3. How such certification should be integrated with the Government’s ICT procurement processes needs to be clarified, and the necessary action taken. (For example, appropriate time may need to be built in for companies to seek and acquire certification).

4. The above should enable the approach to be ‘fleshed-out’, so that the mainstream ICT industry can be consulted. This might benefit from a pilot exercise, where a software quality assurance/audit company tests an agreed, existing piece of software. A view may be formed as to the order of magnitude of fees for certification testing.

5. Thought will need to be given to any cascade/subcontracting implications, such as where a company provides a product to Government, which itself uses software (which may or may not be sourced from another company). For example, transport and armaments use software for a range of purposes – is the Government confident of the software quality?

6. Assuming a positive outcome from the consultation, the approach is then implemented. This will include: a process to accredit software quality assurance/audit companies to certificate software; with suitable publicity to enable ICT companies to take appropriate action.

The above course of action should not require a great deal of time, and could be completed within a matter of months. By setting explicit, transparent software quality standards, the Government will send out a clear message about the importance of software quality assurance. An independent certification process should enable the opening up of the ICT market to SMEs, at minimal cost to the taxpayer, and bring confidence to Government about proposals/products received.

Option B: Consortia Approach

An alternative approach is to use, or encourage, consortia with three components to develop ICT systems:

- Large companies to supply the vision and overall control;
- Small companies to supply the technical expertise; and
- An independent quality assurance specialist company.

It is recommended here that it is the quality assurance specialist company which has overall project control so that all quality issues can be addressed in a timely fashion. This recommendation arises from the observation that DO-178b[5] requires persons (Designated Engineering Representatives) who have authority over all other project personnel and who sign-off that project. It is these people who ensure overall other considerations that quality is never compromised[3]. It should be noted that Designated Engineering Representatives are more powerful and more stringent than Independent Safety Auditors that relate to software [19].

Option C: Contract Requirement
This is something of a pragmatic hybrid of the above. It would have procurement processes undertaken in a similar way to that at present, but the key development would be to include a contract requirement that the successful company must arrange for its software to be quality assured by an independent specialist company, which will be responsible for signing-off the project. This may or may not specify the involvement of a Designated Engineering Representative, according to the nature of the system being procured. The cost of the independent quality assurance would need to be built in to the bid; thereby incentivising the bidders to ensure high quality software so that such costs are minimised.

In this way the Government is ensuring access to appropriate independent specialist skills at the right time, with no budgeted cost incurred on its own part. The related costs will have been built into the bids and the sums involved and the attitude of the companies would have been evaluated as part of the procurement process.

In circumstances where a company approaches the Government will a novel ICT product then involving an independent specialist company to audit/validate the software on offer represents good sense. The cost of such audit/validation would be the subject of debate and negotiation.

Option C is arguably the most practical way forward. Option A may be considered to be a form of “red tape”, which Governments and Industries are always keen to reduce. Option B could be considered to be somewhat idealist – while collaborative consortia have advantages, there can be no compulsion in their creation and therefore they are unlikely to occur (across the board).

To support such a procurement process one possibility is for the Government agency to appoint the independent specialist company/ Auditor at the outset, to help draft the quality requirements and standards. The Auditor may also participate in the assessment of the bids. The chosen contractor must then accept the role of this Auditor and undertake to satisfy the quality requirements as assessed by that Auditor.

Discussion

The whole issue of public sector ICT systems is challenging, and includes many conundrums, such as the fact that over time a system will become more stable, but at the same time it will become more obsolete.

This analysis of potential procurement processes focuses on a particular issue that is key to underpinning the success of the whole of the Government’s ICT strategy[1]. It needs to be positively addressed, otherwise there is the danger that the good that is in the new strategy will not be realised.

Making software quality and audit a contractual requirement (Option C) is a sensible and practical way forward, which can be quickly acted upon. The results from such audits should be collected and collated on an ongoing basis, so that the Government can strengthen its intelligence in this matter.

The concept of using open-source software which is a central feature of the ICT strategy[1] has much to commend it, but it has to be recognised that the quality of such software is usually completely unknown and can be considered suspect. However, whilst the process-related quality will always remain unknown the product-related quality can definitely be measured and even improved at relatively little cost. The relevant techniques are again essentially those product quality techniques already mentioned and exploited by established companies. This analysis does not challenge the policy of using open-source software in any way. It is aimed at complementing it and strengthening the ways in which (other) systems are procured, in a practical and cost-effective manner, so that those that Government acquires will be of top quality.

Conclusions

The “Third Party Guidance” described above was submitted to the UK Government in February 2013, where it has been circulated to Government teams that have an interest in this area, including the Government Procurement Service itself. Given the timeframes involved in public sector procurements it will be some time before any impact can be measured and evaluated. Nevertheless, the importance of assuring the quality software is something that all Governments need to address in their procurement of ICT systems, particularly given the current systems security agenda. Therefore the “Third Party Guidance” has worldwide relevance.

References

(Accessed 20th January 2014)


