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**PUBLIC PROCUREMENT'S PLACE
IN THE WORLD: THE CHARGE
TOWARDS SUSTAINABILITY
AND INNOVATION**

edited by
Francesco Decarolis - Marco Frey

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Introduction[◇]

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The seven essays in this volume address different issues related to green and innovation procurement as well as more general challenges in public procurement. These studies address both general, abstract problems of optimal public procurement and concrete cases of national or even local public procurement systems. The evidence that they present covers a broad spectrum of countries including Italy, Latvia, the Netherlands and several African countries. Reflecting the different expertise of the authors, the studies draw from the Economics, Engineering, Law and Organization approaches to public procurement and use both theoretical and empirical methods.

We divided these studies into three groups on the basis of their main topic area: green procurement, innovation procurement and challenges in public procurement.

Green (or environmental) procurement is defined as:
«The purchase of products and services which have less impact on the environment and human health compared with competing products or services that serve the same purpose». (UNDP, 2008).

This definition highlights the fact that the main difference between traditional and green procurement consists of the emphasis assigned by the latter to the implications for human health and the environment of the procurement process. Green procurement typically does not entail a radical change in the procurement

[◇] This issue of *Rivista di Politica Economica* publishes some of the studies presented at the panel «Public Procurement's Place in the World: The Charge towards Sustainability and Innovation» held at the International Research Society for Public Management (IRSPM) in Prague, Czech Republic, on April 10-12, 2013.

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process but solely an explicit attempt to incorporate green performance among the goals of the procurement process. Thus, the goal of traditional procurement, cost-effectiveness (or value-for money), is expanded in the case of green procurement to account for factors like: the consumption of raw materials and energy, the use of chemicals in products, the presence of polluting emissions and the amount and type of waste generation.

These goals of green procurement respond to the main environmental challenges of today's society. The over-consumption of resources and the systematic increase of greenhouse gases, hazardous chemicals and waste pose a major threat to the present and, especially, the future of our society. Green procurement aims to address these problems by introducing into the procurement process the need to compare alternatives on the basis of their environmental impact. Such comparison has to be considered in a broad sense, involving the various stages of the procurement process. At the design stage, this could mean assessing the relative environmental impact of different solutions, for instance what are the environmental costs of connecting two cities with a certain type of infrastructure relative to a different one. At the tender evaluation stage, instead, this could imply taking into consideration the type of materials or the type of production technologies that the bidders plan to use. At the realization stage, this implies that environmental considerations have to enter into the decisions taken regarding variations to the original project. Additionally, when the procurement entails delegating the management of the procured object, environmental objectives should enter into the evaluation of the management performance.

During periods of significant cuts in public spending, efficiency in spending on public procurement has become a priority. The economic policy debate in public procurement assumes a key role for sustainable development through concrete stimulus to innovation.

In this context, Green Public Procurement (GPP) is becoming a cornerstone of environmental policy in both the EU and the Member States. The purchasing power of the public administration (19% of GDP in the EU) is a factor with big potential in the market (EC, 2008). GPP is now one of the most innovative operational tools in the context of "second generation" green policies, which have now overcome the setting of sectorial legislation, by embracing a broader, comprehensive approach and aiming to involve all actors within the system of production and consumption.

Several studies have highlighted the potential benefits to be gained from the extensive practice of GPP, in particular in the field of energy consumption and

greenhouse gases emissions. For example, a public demand-oriented, greener energy supply could save 60 million (tons) of greenhouse gases, which corresponds to 18% of the allocated allowance to the EU under the Kyoto Protocol. Still, if all IT purchasers in Europe followed the example of Copenhagen City Council and the Swedish Administrative Development Agency, energy consumption would be cut by around 30 terawatt hours – roughly the equivalent of four nuclear reactors (EC, 2012).

Green procurement is likely the most prominent aspect of a broader trend in procurement toward sustainable procurement. In addition to the environmental aspects, sustainable procurement entails paying attention within the procurement process to elements related to social aspects, such as sustainable supply chains and labour conditions, including child labour, occupational health and safety and compliance with regulations. It is evident how these goals complement the environmental ones of green public procurement in terms of fostering societal well being. Therefore, assessing the performance of green public procurement is a key element of a strategy that seeks to make procurement sustainable.

The first three papers published in this volume concern different aspects of green and sustainable public procurement.

Despite the evident potential benefits that the uptake of GPP can provide to the whole economic system, several obstacles and drawbacks were encountered by local authorities in its application as it emerges in the related literature (see for instance Testa *et al.* 2012). In line with this strand of research Annunziata, Frey, Iraldo and Testa, in the paper «The contribution of Green Public Procurement to Energy Efficiency Governance in buildings», analyze which factors influence the development of green public procurement practices in the building and construction sector. By using data collected by a questionnaire survey among local authorities of the Tuscany Region, descriptive and inferential statistics were performed to test the impact of the following factors on the probability to develop GPP practices: *i)* the knowledge of GPP toolkits and official guideline documents, provided by national and European institutions; *ii)* the participation of public employees in *ad hoc* training sessions on GPP; *iii)* the size of public authority; *iv)* the adoption of an environmental management system. The results confirm, in particular, that official documents and guidelines produced by the European Commission and National governments are useful for supporting public technicians in defining and implementing green tenders. Also training sessions are effective to create know-how, as well as to improve the ability to include green criteria in each phase of the tender.

In line with the above mentioned contribution, in the paper «Sustainable Procurement in Practice: Explaining the Degree of Sustainable Procurement from an Organizational Perspective», Grandia, Steijn, Groeneveld and Kuipers explore how organizational factors influence the degree of sustainable procurement in public procurement projects in the Dutch national government. The authors address the broader issue of sustainable (*i.e.*, both green and social) procurement from an organizational perspective, by using a case study analysis. In detail, they investigate how three organisational factors – top management support, expertise and commitment – influence the adoption and effectiveness of sustainable procurement in two public procurement cases in the Netherlands. The results show that effective commitment appears to be a determinant of the degree of sustainable procurement while further research is need to investigate the role of the other two factors in supporting sustainable public procurement.

A different approach to the issue of green procurement for the building sector is offered in «A Holistic Approach To Developing Existing Building Commissioning In European Public Real Estate» by Cesarotti, La Bella, Varani, Rotunno, Martinelli, Spada, Di Fausto, Casara. In this paper, the authors study the improvement of building conditions and performance achievable through Building Commissioning. Building Commissioning is a type of facility management according to which building systems and their interactions are tested and verified to suit current requirements. In the study, the authors describe this method and illustrate its application drawing from two cases involving, respectively, a large private firm and an international agency and highlight how this approach could be effectively used by a public purchaser to improve the energy management of public buildings.

The second group of studies presented in this volume is mostly focused on issues related to innovation procurement. By innovation procurement, we refer to the process of procuring works, goods or services that are characterized by being innovative either because they represent novel works/goods/services or because the means through which they are produced or managed is novel. Relative to traditional procurement, innovation procurement is characterized by certain peculiar features. For instance, even defining innovative procurement is not a trivial task because it requires identifying the degree of novelty that a product or process must satisfy to be considered an innovation.

A second feature of innovation procurement that makes it special is the fact that it entails a greater amount of uncertainty relative to other types of procurement. Indeed, in addition to the traditional cost uncertainty intrinsic to the pres-

ence of a time lag between when the contract is procured and when its execution is finalized, in the procurement of innovation there is no certainty that the object of the contract can be developed within the expected amount of time. Indeed, the contractor who wins the contract will have to invest in research and development activities whose outcome is *ex ante* uncertain.

Contrary to green procurement, whose objectives, as we mentioned, are often achievable through the same tools as in traditional procurement, addressing the peculiarities of innovation procurement typically requires more radical departures. In the case of defense procurement, where historically most of innovative procurement has been concentrated, an example is the use of split-award contracts (see Anton and Yao, 1989): to increase the probability that the new defense technology will be completed within the desired amount of time, two or more bidders are awarded the contract and simultaneously work on its realization. Then, the contractor that finishes first (conditional on having met the other *desiderata* for the new technology) is paid a bonus while all the other contractors are paid a basic fee.

In part because of the numerous and important spillovers that originated from defense procurement of innovation (the Internet, just to name one), innovation procurement has become a major theme in the public sector. Numerous public institutions have explicitly stated the goal of using public procurement to foster innovation so that its development could later be transferred to the private sector and benefit the entire society. For instance, the European Commission put forward the “Innovation Union” program as a key element of the 2020 strategy with the intent to guide and support contracting authorities in implementing procurement of innovation. Efforts to promote innovation procurement have interested different areas like health care and green procurement. As regards the former, an example is the institution in Canada of a Council for Innovation Procurement in Health Care that collaborates with health care organizations in transferring knowledge and best practices related to innovation procurement processes.

As regards the interaction of innovation and green procurement, an example is the procurement of Alternative Fuelled Vehicles (AFVs) in the USA. This program fosters innovation by making targeted acquisitions of vehicles running on alternative technologies and, as a result, can stimulate the production of new, greener technologies in the private market. More generally, it is natural that the relatively novel attention of society to environmental issues can be usefully addressed by public procurement of innovation which has the potential to stimulate the development of environmental friendly products and green energy technologies.

Therefore, innovation is not only a topic of great relevance by itself, but it is also a key complement to green and, more generally, social procurement. The second group of papers in this volume are then particularly relevant for understanding how innovation procurement interacts with the issues of green procurement described by the first group of papers. The first study in this second group is «Public Procurement for Innovation in Small States - The Case of Latvia» by Cepilovs. This paper analyzes the special constraints that innovation public procurement encounters when used as a demand-side tool to promote innovation in the context of a small state like Latvia. The key problems identified revolve around the problems for a small state to develop the administrative capacities necessary for effective design and implementation of innovation procurement.

The second study on innovation procurement is «A Conjecture on Institutional Rationalities and Property Rights in Public Procurement of Innovation» by Ågren and Rolfstam. The paper develops a comparison between the process of concluding a procurement contract and Nash bargaining. This leads the authors to stress that a key and often underestimated element of effective procurement, is the knowledge of all the participants in the procurement activities of both their own and the others' institutional rationalities. Rationality in this context resembles an evolutionary assumption that organisations are entities that evolve with scarce resources through purposeful selection. Without shared knowledge of the drivers of these institutions, the complex structure of the procurement process is unlikely to function properly.

The challenges involving innovation procurement presented by the two latter studies are linked in one case to the small-nature of the procurement state and in the second case to the limits of institutional rationalities. Innovation procurement faces a few other challenges that are specific to its nature; they entail, for instance, issues related to (i) the intellectual property rights associated with the innovation and (ii) the long term perspective needed to evaluate the benefits of a technological spillover. The latter is obviously a major challenge for green procurement too. Furthermore, both green and innovation procurement are potentially affected, possibly to a higher degree, by the same challenges that characterize traditional public procurement.

The final part of this volume presents two studies that analyze some of these challenges. In particular, these studies focus on corruption and favouritism in two different environments: one looks at a developed economy (Italy), while the other analyzes a collection of developing African countries. Corruption and favouritism, together with the risk of non-completion of the contract, the risk of

contractors' collusion and the risk of defects in the project design are the major challenges that traditional procurement systems are designed to address (see Decarolis *et al.*, 2010).

There are multiple reasons why green and innovative procurement are likely to be particularly sensitive to the risk of corruption and favouritism. In particular, both types require greater discretion from the public procurement authority, for instance evaluating the long run effects on the environment and innovation spillovers of a certain project or a certain tender. More specifically, in green public procurement, advantaging local contractors might be a form of favoritism that unduly exploits green motivations. Similarly, in innovation procurement, the greater uncertainty intrinsic in the production process and the lack of a clear benchmark for the product to be delivered imply an increased scope for the risk of corruption and favouritism.

The first paper in this third and last group is «Favouritism and Inefficiency in procurement: Evidence from Public Works in Italy» by Decarolis and Giorgiantonio. In it, the authors analyze both theoretically and empirically a series of local reforms affecting the local regulations of public work contracts, in terms of both the contract awarding rules and the entry qualification criteria for bidders. They show how, despite the usage of rigid and transparent rules, the regulation changes introduced by local procurement authorities can be explained best by considering them an attempt to manipulate the market in favour of local contractors.

The second paper is «Public Procurement And Corruption in Africa: A Literature Review» by Mushagalusa Nshombo and Appolloni. This paper reviews the state of the literature on corruption in public procurement with a focus on Africa. More specifically, it examines what it is known about the determinants of public procurement corruption in Africa, and finds that the economic, political, organizational and social determinants have a significant relationship with public procurement corruption in Africa.

The findings in these latter two papers are a cautionary tale about the challenges facing green and innovation procurement and suggest that even for traditional procurement many problems are still unsolved.

In conclusion, the papers in this volume discuss the potential for green and public procurement, but also stress the main challenges to both these specific areas of procurement and those more generally affecting all public procurement. The studies in this volume offer a broad array of perspectives on these issues. Accordingly, they contain policy suggestions that encompass the economic, engineering, legal, and organizational perspective that are likely to be useful for the

design of policies in these areas of public procurement which are hotly debated topics both in the policy and academic circles. Some insights for future research are also provided. In particular, more research is needed to understand the effect of green and innovative public procurement on economic systems. In detail, it would be very notable to analyze if GPP and PPI are able to steer firms and supply chains into greener development paths promoting resource saving and green innovation.

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I - GREEN PROCUREMENT

The Contribution of Green Public Procurement to Energy Efficiency Governance in Buildings

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Public authorities will play a crucial role fostering demand for energy efficient buildings through Green Public Procurement (GPP) and contributing to energy efficiency governance at local level. Using an econometric analysis, this study investigates which factors influence the development of GPP practices in the building and construction sector as supporting instrument for energy efficiency governance by the municipalities in Tuscany (Italy). The results highlight that GPP practices in the building and construction sector can contribute to the energy efficiency governance at local level if municipality undertakes a path which integrates increasing energy and environmental awareness and technical know-how and expertise.

[JEL Classification: H57; M48; Q58].

Keywords: green public procurement; local authorities; governance; energy efficiency; building and construction sector.

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1. - Introduction

The building and construction sector can contribute to sustainable development generating social and economic benefits to society and reducing related environmental impacts (UNEP, 2007). In fact, buildings account for about 40% of the world's energy use. Therefore, the building and construction sector has to face the challenge of improving energy use in buildings and consequently minimizing greenhouse gas emissions. This challenge involves all stakeholders of the complex supply chain of the building and construction sector (Lovins, 1992). For this purpose, public authorities can play a crucial role in the sector, not only as regulators but also as building owners, tenants, developers and financiers. Then, public authorities can foster a demand for energy efficient buildings that can have a positive impact directly on the market. According to the United Nations Environment Programme (UNEP) «governments should seek to explore this opportunity to influence the building sector not only as a regulator, but also as an actor, putting up a good example for others to follow» (UNEP, 2007).

The importance of public institutions as market players is confirmed by the great impact of public procurement on Gross Domestic Product (GDP): between 8 and 25% in OECD countries and 19.7% in EU-27 countries (OECD, 2000; European Commission, 2010). The magnitude of public purchasing power could concretely stimulate production and consumption trends towards a demand of energy efficient and environmentally friendly products and services (Li and Geiser, 2005; Edler and Georghiou, 2007; Ambec and Lanoie, 2008). In particular, buildings belong to a product group which represents one of the biggest share of GPP budget and consequently the public procurement associated with the building and construction sector can exert a considerable impact on the market (Kahlenborn *et al.*, 2011).

In general, the integration of green *criteria* (*e.g.* energy saving *criteria*) in public tenders could produce environmental benefits (Parikka-Alhola, 2008). For instance, the selection of greener energy supplies in public sector could bring savings for 60 million tons of greenhouse gases, *i.e.* 18% of quotas assigned to the European Union by the Kyoto Protocol. The adoption of energy-efficient computers in all EU public authorities could achieve the reduction of 830 thousand tons of CO₂ released in the atmosphere (Ochoa and Erdmenger, 2003). The study of PricewaterhouseCoopers *et al.* (2009) estimates an average reduction of CO₂ emission of 25% related to adoption of Green Public Procurement (GPP) practices in 2006-2007 in seven European countries (Austria, Denmark, Finland,

Germany, Great Britain, the Netherlands and Sweden) for ten product groups¹ analysed. The adoption of GPP practices could also increase the development of innovations, because it fosters the deployment of solutions to satisfy a “new” demand for products and services (Geroski, 1990). Consequently, GPP could be a policy instrument able to improve environmental and competitive performance in firms (Testa *et al.*, 2011). Furthermore, the adoption of GPP practices could support public institutions during their purchase decisions from an economic point of view, because a careful analysis of initial capital costs and long-run operating costs among possible solutions would favour the more energy-efficient and the greener one (PricewaterhouseCoopers *et al.*, 2009).

These benefits have fostered the adoption of GPP policies and national plans in many countries including countries in the EU (Bouwer *et al.*, 2006; DEFRA, 2007; Kahlenborn *et al.*, 2011) but also the United States (McCrudden, 2004; Swanson *et al.*, 2005), Canada (Brammer and Walker, 2011), South Africa (Bolton, 2006, 2008), Asia (Ho *et al.*, 2010), Australia (Chang and Kristiansen, 2006) and Japan (Brammer and Walker, 2011). These GPP policies are more frequently focused on some product groups and particularly on the building and construction sector (Kahlenborn *et al.*, 2011).

The role of public purchases as a *stimulus* for energy efficient and environmental friendly products and services has been a recent strand of research (McCrudden, 2004; Weiss and Thurbon, 2006; Nissinen *et al.*, 2009; Walker and Brammer, 2009). Furthermore, studies of green procurement carried out in the public sector are only few compared to studies on environmental and sustainable supply chain management in the private sector (Walker and Brammer, 2012). Walker and Brammer (2012) have made a review on existing studies of sustainable public procurement and found that previous studies have analysed the level of adoption of GPP in social housing (Hall and Purchase, 2006) and the development of tools to assist the adoption of GPP in the building and construction sector (Molenaar *et al.*, 2010; Willis, 2010; Tarantini *et al.*, 2011). This study investigates which factors influence the development of GPP practices in the building and construction sector as supporting instrument for energy efficiency governance by the municipalities in Tuscany, one of the Italian Region with more advanced policies on public procurement. In fact, Tuscany Region has promoted

¹ This study analyses the following product groups: cleaning products and services, construction, electricity, catering and food, gardening, office IT equipment, paper, textiles, transport and furniture.

GPP practices since the nineties through some regional laws on recycled materials and energy efficient practices in buildings and renewable sources for hot sanitary water in all local authorities (*e.g.* municipalities) (Rete delle Agende 21 locali della Toscana, 2007).

The analysis considers GPP practices in buildings at municipal level because they are an effective instrument in order to achieve energy efficiency improvements in the building and construction sector and can contribute to carry out an energy efficiency governance at local level. As Laponche *et al.* (1997) argue, the implementation of energy efficiency improvement is a decentralized activity and consequently municipalities have an essential role to support the use of related measures.

The paper is structured as follows. Section 2 introduces the relation between governance of energy efficiency and GPP in the building and construction sector at local level. Section 3 addresses research design and data description. Section 4 presents the main results of the analysis. Finally, Section 5 addresses implications of the results for policy issues and future research.

2. - Governance of Energy Efficiency and GPP in buildings

There is a worldwide consensus on the need for energy efficiency and particularly energy efficiency in buildings. According to European Energy Efficiency Plan (2011) buildings along with transport have the greatest energy saving potential. Therefore, widespread energy efficiency policies are put in place, but their implementation proceeds very slow and energy efficiency potential is not maximized (Gupta and Ivanova, 2009; Jollands and Ellis, 2009). Some studies argue that it is crucial to deploy a suitable energy efficiency governance which is not only technocratic but also integral and socially oriented (Gupta and Ivanova, 2009; Jollands and Ellis, 2009; Golubchikov and Deda, 2012).

Drawing on the governance literature and the characteristics of energy efficiency (Rhodes, 2000; Bulkeley, 2005; Murphy and Yanacopoulos, 2005; Hisschemoeller *et al.*, 2006; Biermann, 2007; Improvement and Development Agency for local government, 2008), energy efficiency governance can be defined as «use of political authority, institutions and resources by decision-makers and implementers to achieve improved energy efficiency» (Jollands and Ellis, 2009). This definition crosses many spatial dimensions (local, regional, national and international) including a wide range of actors (government and non-governmental or-

ganisations/subjects). Jollands and Ellis (2009) state that a governance system consists of two components: resources and structures for governance and governance activities. The former ones can be identified as institutional structures, human and financial resources, human capacity and training, and political support/mandate. The latter ones are represented by actions associated with the governance system such as: energy efficiency strategies, policy development processes, funding mechanisms, monitoring programmes, compliance and enforcement, and R&D activities. This framework needs a multi-level governance (Bulkeley and Betsill, 2005; Smith, 2007) in order to develop an effective energy efficiency governance. For instance, energy efficiency targets established by national institutional structures influence local level actors and related resources and capacity. Then, an effective articulation of energy efficiency governance framework supports the success of energy efficiency policy efforts (International Institute for Energy Conservation, 2007; Laponche *et al.*, 1997; Limaye *et al.*, 2008).

A multi-level approach in energy efficiency governance is fundamental to implement energy efficiency in buildings, because the building and construction sector has a high energy efficiency potential and is a complex sector (Lovins, 1992). Then, the deployment of energy efficiency in the building and construction sector requires “a strong institutional *milieu*” which stimulates the deployment of energy efficient solutions, informs consumer choice concerning these options, foster behavioural change and balances different interests (Golubchikov and Deda, 2012). In fact, progress towards energy efficient buildings needs not just technical solutions but also social and institutional support (Rohracher, 2001). Furthermore, energy efficiency policies have to be integrated in the whole policy mix to increase energy efficiency policy effectiveness in buildings (Hoppe *et al.*, 2011; Golubchikov and Deda, 2012).

Gupta and Ivanova (2009) underline the importance of a global energy efficiency governance, but the improvement of energy efficiency especially in the building and construction sector is a decentralized activity and is supported by a network of partners (*e.g.* enterprises, local authorities, government services, households, etc.) (Laponche *et al.*, 1997). In this context local authorities, such as municipalities, can ensure conditions and solutions for energy efficiency improvements (Rezessy *et al.*, 2006). Local authorities can assume several roles in order to support energy efficiency in the building and construction sector. In particular, they can be market initiators, buyers, borrowers and implementers for energy efficiency measures in buildings (Rezessy *et al.*, 2006). Consequently, local authorities can promote an energy efficiency policy in the building and construc-

tion sector through the deployment of GPP practices. The adoption of GPP in the building and construction sector becomes an instrument which contributes to energy efficiency governance.

In any case, it is important to take into account that the success of energy efficiency policy from local authorities is linked to some preconditions which can predict the success and effectiveness of local environmental but also energy efficiency policy (Barrutia *et al.*, 2007; Evans *et al.*, 2005; Nijkamp and Perrels, 1994). These preconditions can be identified with the following factors: knowledge mix, employment of experts, the presence of motivated and knowledgeable people in the municipal organisation, adequate institutional support to energy efficiency targets in the whole municipal organisation, sustainable management approach, the presence of favourable political parties to energy efficiency policies, an official who checks policy agenda, support from higher levels of government, favourable supporting network outside the municipal administration and capacity to influence local target groups (Hoppe *et al.*, 2011). Therefore, it is crucial to analyse the factors which influence the contribution of local authorities to energy efficiency governance in buildings through GPP practices.

3. - Survey Design and Data Description

In order to analyse which factors influence the GPP practices in the building and construction sector in Tuscany region, we created a set of variables through primary data collected by an online *questionnaire* carried out from September to December 2011. We sent *via e-mail* the *questionnaire* and the cover letter to a random sample of 81 municipalities out of a total number of 287. The survey had a response rate of 76.5%. The respondents were purchasing, environmental and public works managers. More detailed information about respondent municipalities and sampled population are summarized in Table 1.

Respondents were asked to indicate if their administrations have set up procedures according to GPP practices in the building and construction sector. Therefore, we constructed a binary variable. Then, participants were asked how many categories of application (*i.e.* work, service and supply) for GPP practices they had adopted. By using four alternatives provided we obtained a categorical variable. To avoid possible biases associated with a different interpretation of green procurement, a procurement is considered as “green” if it uses the environmental criteria identified at EU and/or Italian level in their official guidelines and

documents in each stage of the tender. Thus, a methodological annex was sent to interviewees and a sample of tenders was controlled in order to test the reliability of answers.

This analysis used a set of binary variables to measure if public procurers were trained to include energy efficient and environmental criteria during purchasing process; and if procurers frequently used the GPP toolkit and official documents provided by national and European policy makers.

The size of public authority was measured using population data from 2011 National Demographic Balance² published by the Statistical National Institute (ISTAT) for all Italian municipalities.

The adoption of an Environmental Management System (EMS) was measured considering the stage of adoption (not adopted, in phase of implementation and adopted) of a certified EMS (ISO 14001 standard or EMAS regulation) by collecting these information on the official web-site of Italian Accreditation Body – Accredia for ISO 14001 and of Italian Competent Body for EMAS registration.

The study also takes into account the level of importance of environmental issues for municipalities at strategic level and the structure of purchasing system in order to capture the effect of political and organizational structure. Finally, the analysis investigates the extent to which specific barriers (such as increasing costs, lack of suitable personnel, lack of information about environmental friendly and energy efficient products, lack of supply for environmental friendly and energy efficient products, inadequacy of regulation, long purchasing process, delay in execution process) affect the implementation of GPP practices in the building and construction sector. Table 2 presents descriptive statistics for the key variables.

During survey design we have taken into account the potential presence of common method biases that generally affect survey data (Podsakoff *et al.*, 2003). We have adopted several procedural remedies to reduce biases such as: minimizing item ambiguity avoiding vague concepts, complicated syntax and unfamiliar terms; keeping questions simple, specific, and concise; avoiding the use of bipolar numerical scale values and providing verbal labels for the midpoints of scales and guaranteeing respondents anonymity.

² National Demographic Balance consists of last census data updated by annual births and deaths and annual changes of residence.

TABLE 1

SAMPLE'S DETAILS				
	Population	% of Population	N. of Municipalities	% of Municipalities
Tuscany	3,749,813		287	
Sampled Municipalities	1,946,028	51.9	81	28.6
Respondent Municipalities	1,026,114	27.4	62	21.6

TABLE 2

DESCRIPTIVE STATISTICS					
Variable	Obs.	Mean	Std. deviation	Min	Max
GPP in buildings	48	.6875	.4684	0	1
Level of GPP in buildings	48	2.292	1.11	1	4
Training on GPP	45	.333	.476	0	1
Knowledge of GPP toolkit and guidelines	45	.467	.504	0	1
Environmental strategy	62	3.242	.8235	1	5
Stage EMS adoption	62	1.435	.760	1	3
Population	62	16550	28929	504	161131
Structure of purchasing process	48	2.458	.797	1	3
B1 - Increasing costs	46	2.5	1.1304	1	5
B2 - Lack of suitable personnel	46	2.478	1.1877	1	5
B3 - Lack of information about environmental friendly and energy efficient products	46	2.391	1.1639	1	5
B4 - Lack of supply for environmental friendly and energy efficient products	46	2.022	.9064	1	5
B5 - Inadequacy of regulation	46	2	.9661	1	5
B6 - Long purchasing process	46	1.978	1.064	1	5
B7 - Delay in execution process	46	2	1.011	1	5

4. - Results³

4.1 *The Uptake of GPP Practices*

Many studies highlight that building and construction sector plays a crucial role in the adoption of GPP practices (PricewaterCoopers *et al.*, 2009; Kahlenborn *et al.*, 2011; Renda *et al.*, 2012). Despite construction is a priority product groups, this product group still lags significantly behind the EU target of 50% (Renda *et al.*, 2012). The analysis shows that the majority of municipalities (68.8%) adopted GPP practices in the building and construction sector in 2008-2011, but only 18.8% adopted GPP practices in all categories of application (*i.e.* work, service and supply). These actions confirm the efforts to support GPP in some Italian regions (Iraldo and Testa, 2007), but also the potential for improvement.

The Spearman test depicts that the size of public municipality and the structure of purchasing system do not influence the adoption and the level of adoption of GPP practices pointing out the importance of a specific technical and organizational support to deploy GPP practices in the building and construction sector.

4.2 *Energy Efficiency and Environmental Strategy and EMS*

The adoption of GPP can belong to a broader environmental strategy of public authorities, *i.e.* relevance that environmental protection and energy efficiency have in their decisions and activities. In this study 83.9% of respondents have taken into account environmental issues at strategic level. The Spearman test confirms a correlation between the adoption of GPP practises and the presence of an overall environmental strategy in municipality (0.2408*). On the other hand, the absence of correlation between the level of adoption of GPP practices and the presence of an environmental strategy could be explained by the fact that public administrations tend to overestimate their environmental strategy (Varnas *et al.*, 2009; Ochoa and Erdmenger, 2003).

Furthermore, the implementation of GPP practices in the building and construction sector can be supported by another special tool such as EMS, which can be deployed through formal standards such as ISO 14001 and EMAS (Iraldo *et al.*, 2009). In fact, an EMS foresees the definition of a scheme for organizations in order to manage their environmental impacts and continuously improvement of their environmental performance. Despite Italian public administrations adopt more frequently, than other EU Member States and OECD countries certified

³ ***, ** and * indicate the significance at the 1%, 5% and 10% level, respectively.

EMSs, the majority of surveyed municipalities (72.6%) have not yet adopted an EMS, but 11.3% is implementing a certified EMS and 16.1% adopted an EMS. The Spearman test confirms that the stage of EMS influences positively the adoption (0.2741*) and the level of adoption of GPP practices in the building and construction sector (0.3367**).

4.3 *Technical and Organizational Support to GPP Practices*

The adoption of GPP in building and construction sector needs technical expertise and know-how which often are missing in the environmental and financial department of a municipality. In fact, a recent study on practices and issues regarding green procurement of construction contracts in Sweden reveals that the lack of knowledge is one of the limits on the application of environmental procurement preferences in constructions contracts (Varnas *et al.*, 2009).

Several studies have analysed effective tools to support the implementation of green procurement in local authorities such as suitable legislation and information (Günther and Scheibe, 2006; Thomson and Jackson, 2007; Fet *et al.*, 2011). In order to foster the development of GPP, governments have a fundamental role consisting in the provision of clear legislative and regulatory support in decentralised public organizations (Lundqvist, 2001).

For this reason 46.7% employed GPP toolkit and official documents provided by national governments and European Union, and 33.3% of municipalities arranged training courses on GPP for personnel. The Spearman test highlights a significant correlation between the use of GPP toolkit and official documents and the adoption (0.3296**), but also the level of adoption of GPP practices in the building and construction sector (0.3651**).

4.4 *Barriers to GPP Practices*

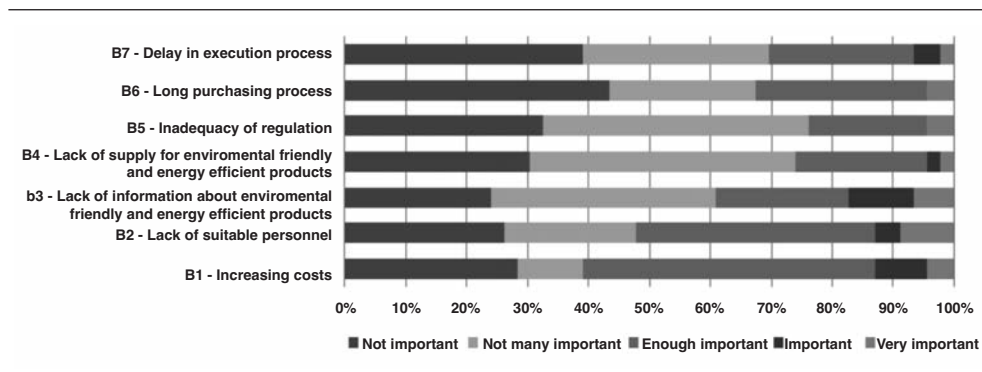
The adoption of GPP practices can tackle several obstacles. In particular, some studies underline the difficult implementation of GPP practices in the building and construction sector (Bouwer *et al.*, 2006; PricewaterhouseCoopers *et al.*, 2009; Renda *et al.*, 2012). This analysis shows that the majority of respondents (60.9%) consider the increasing costs related to the adoption of GPP practices in the building and construction sector as the main barriers to GPP practices in this sector. The other relevant barriers are the lack of suitable personnel for the adoption of GPP practices during purchasing process (52.2%) and the lack of information about environmental friendly and energy efficient products and services (39.1%).

The rest of barriers evaluated as much less significant for the uptake of GPP in the building and construction sector are: long purchasing process associated with the adoption of GPP practices (32.6%), delay in the execution process related to the adoption of GPP practices (30.4%), lack of supply for environmental friendly and energy efficient products (26.1%) and inadequacy of regulation (23.9%) (Graph 1).

The Spearman test confirms that a high level of adoption of GPP practices in the building and construction sector is hindered by the difficult collection of suitable information about environmental friendly and energy efficient products and services (0.2661*). This result points out the importance to provide suitable information about products and services which can support civil servants during purchasing process.

GRAPH 1

BARRIERS TO GPP PRACTICES IN THE BUILDING AND CONSTRUCTION SECTOR



4.4 Model Estimation

In order to enhance the analysis of influencing factors on the GPP practices in the building and construction sector in Tuscany region, the study estimated a model using a logistic regression analysis to test the adoption of GPP practices in the building and construction sector and an ordinal logistical regression to test the level of adoption of GPP in the building and construction sector.

The analysis of determinants of GPP adoption and level of GPP adoption in the building and construction sector shows that the knowledge of GPP toolkit and official documents and the attendance of civil servants at training courses on GPP are strong drivers to foster GPP practices in the building and construction

sector. Therefore, European and national efforts through information and awareness campaigns about GPP advantages and related training courses start to give positive outcomes in public authorities (Iraldo *et al.*, 2007; Testa *et al.*, 2012). In particular, the lack of knowledge is an important barrier to the implementation of GPP in the building and construction sector (Varnas *et al.*, 2009). These results underline the urgency to provide more and more detailed technical guidelines to support civil servants during purchasing process for a complex product such as a building and related materials. Regarding the Italian context, a stimulus to the development of GPP in the building and construction sector might come from the approval of national minimum environmental requirements for buildings. The actual level of development of GPP in the European and Italian building and construction sector points out a great potential for the improvement of energy performance in buildings (Meijer *et al.*, 2009; Bouwer *et al.*, 2006). Therefore, suitable training programmes and toolkits can improve also the quality and effectiveness of adoption of GPP practices in the building and construction sector. This aspect is highlighted by the high odds ratios associated with “Training on GPP” and “Knowledge of GPP toolkit and guidelines” in both equations (Table 3 and 4). In particular, guidelines for GPP practices increase the probability of GPP adoption and related quality in the building and construction sector more than training courses on GPP. Furthermore, these instruments can increase the internal capabilities of the entire municipal organization, because they assume an interdisciplinary role influencing positively individual knowledge of civil servants but also decision making process of entire local authorities (Nissinen *et al.*, 2009).

The population (as a proxy of municipality’s size) does not influence the GPP adoption and the level of GPP adoption in the building and construction sector. We believe that this finding is not affected by the adopted measure of municipality dimension, since a recent study – which used the natural logarithm of the organisation’s total purchasing expenditure as proxy of public organization dimension – confirms that organisation’s dimension does not influence the adoption of sustainable procurement practices (Walker and Brammer, 2012).

The two estimated equations do not find that the presence of general environmental strategy in municipalities is a significant driver for the development of GPP practices in the building and construction sector. These results confirm a common trend among public authorities to overestimate the application of green choices (Varnas *et al.*, 2009; Ochoa and Erdmenger, 2003). Probably, the adoption of an environmental strategy needs a formalisation within organisation and time to be implemented.

The stage of EMS adoption is not significant in the two equations: the GPP adoption and the GPP level of adoption in the building and construction sector. The implementation of EMS is not sufficient to support the adoption of GPP practices in the building and construction sector. Several studies emphasise the difficulty of implementing EMSs in the construction industry since this industry has specific characteristics which hinder the application of traditional management systems (Gangoells *et al.*, 2011; Ball, 2002; Griffith and Bhutto, 2008). Consequently, the only adoption of EMS does not guarantee a successful development of GPP practices in the building and construction sector. EMS can be rather a first step which should be followed by training and guidelines on GPP.

Finally, this study finds that the structure of purchasing process is not significant regarding the GPP adoption and the level of GPP adoption in the building and construction sector (Table 3 and 4). This result suggests that GPP practices are promoted by the expertise of civil servants in municipalities.

TABLE 3

RESULTS OF LOGISTIC REGRESSION ANALYSIS FOR GPP ADOPTION IN THE BUILDING AND CONSTRUCTION SECTOR

	GPP in buildings		
	<i>Coeff.</i>	<i>Odds Ratio</i>	<i>z</i>
Training on GPP	4.53	93.54	2.16**
Knowledge of GPP Toolkit and Guidelines	4.78	119.11	2.22**
Environmental Strategy	.3871	1.47	0.44
Stage EMS adoption	.813	2.25	0.97
Population	.0000777	1.00	1.38
Structure of Purchasing Process	-.954	.385	-1.05
Constant	-3.48	.030	-1.02
<i>Number of Observations</i>		44	
LR χ^2		22.32***	
Pseudo- R^2		0.4054	

***, ** and * indicate the significance at the 1%, 5% and 10% level, respectively.

TABLE 4

RESULTS OF ORDERED LOGISTIC REGRESSION ANALYSIS FOR THE LEVEL OF GPP ADOPTION IN THE BUILDING AND CONSTRUCTION SECTOR

	Level of GPP in buildings		
	<i>Coeff.</i>	<i>Odds Ratio</i>	<i>z</i>
Training on GPP	3.54	34.51	2.72***
Knowledge of GPP Toolkit and Guidelines	4.20	67.12	3.32***
Environmental Strategy	.045	1.05	0.09
Stage EMS Adoption	.656	1.93	1.56
Population	.0000186	1.00	0.95
Structure of Purchasing Process	-.560	.57	-1.44
<i>Number of observations</i>		44	
LR χ^2		25.46***	
Pseudo- R^2		0.2115	

***, ** and * indicate the significance at the 1%, 5% and 10% level, respectively.

5. - Discussion and Conclusions

This study aimed to explore factors which influence the development of GPP in the building and construction sector as supporting instrument for energy efficiency governance by local authorities such as municipalities.

The results underline the strong importance of qualified and well-informed personnel on GPP practices in the building and construction sector. An increasing awareness on GPP practices fosters the complex supply chain of the building and construction sector to improve energy performance of buildings and related materials. Moreover, suitable training activities and guidelines for civil servants can develop the knowledge of overall local authorities on environmental and mainly energy efficiency issues. Moreover, the development of GPP practices in the building and construction sector can lead municipalities to complement the energy management of their building stock with the promotion of energy efficiency measures also in residential buildings (Hoppe *et al.*, 2011). Consequently, this process of internal growth in the municipalities might improve their contribution to energy efficiency governance in the building and construction sector. As European legislation foresees, local authorities have a crucial role and have to increase their efforts to implement energy efficiency measures in buildings (European Commission, 2012).

The significance of guidelines on GPP practices in the building and construction sector highlights the role of the EU and national governments which have to support decentralised public authorities through clear regulations and technical guidelines in order to raise their level of awareness and expertise, but also to create a favourable context for the adoption of GPP (Lundqvist, 2001; Bouwer *et al.*, 2006). Therefore, a coordination between central governments and municipalities is needed to improve the development of GPP practices in the building and construction sector and the deployment of energy efficiency governance at local level (Sperling *et al.*, 2011).

The fact that the dimension of municipalities does not influence the adoption of GPP practices in the building and construction sector can raise some evaluations. As mentioned above, the development of GPP in the building and construction sector requires specialised personnel. Therefore, the support provided by training and guidelines on GPP practices is decreasing possible differences among small and large municipalities. On the other hand, strong budget constraints affect all public authorities because of current economic crisis. Consequently, a suitable knowledge of GPP practices for the building and construction sector might lead to shift from the purchase cost approach to life-cycle cost approach in order to manage more efficiently public resources (Sterner, 2002; Varnas *et al.*, 2009).

Another relevant issue to be discussed concerns the relationship between the presence of a general environmental strategy in municipalities and the development of GPP in the building and construction sector. The presence of a general environmental strategy in local authorities might foster the adoption of GPP practices in the building and construction sector only with a strong leadership (Bansal and Roth, 2000). This leadership has to be able to foster the transformation of environmental and energy awareness into effective technical solutions for buildings and related materials. Otherwise, the implementation of GPP faces the overestimation of green preferences and thus the plucking of “low hanging fruits” related to energy efficiency measures in local authorities (Rezessy *et al.*, 2006; Hoppe *et al.*, 2011).

A controversial result regards the lack of significance of the relationship between the stage of EMS and the development of GPP practices in the building and construction sector. As Emilsson and Hjelm (2002) state, the implementation of EMS is often considered as a project and not as continuous and integrated processes in local authorities in order to improve organisation’s environmental performance. Moreover, some studies show that public authorities apply EMSs

focusing mainly on “direct environmental aspects” and overlooking the importance of the “indirect aspects” which are associated with the environmental performance and practices of their contractors, subcontractors and suppliers (Von Malmborg, 2003; Testa *et al.*, 2012). For this reason, the adoption of EMS does not necessarily foster the deployment of GPP initiatives in the building and construction sector triggering a synergy. Then, the municipality’s motivation is crucial to drive an effective implementation of EMS in order to support other municipal policies such as GPP practices (Emilsson and Hjelm, 2002).

These findings highlight that GPP practices in the building and construction sector can contribute to the energy efficiency governance at local level, if municipality undertakes a path which integrates increasing energy and environmental awareness and technical expertise. In fact, the energy efficiency governance in buildings needs resources and structures for governance, *i.e.* technical expertise and know-how, and governance activities, *i.e.* energy efficiency strategies (Jollands and Ellis, 2009). Since the public procurement decisions are complex processes where several external stakeholders and decision makers within administration act (Günther and Scheibe, 2006), the implementation of GPP initiatives in the building and construction sector constitutes a sort of training for municipalities in order to deploy an energy efficiency governance at local level.

This study presents some limitations. The data were self-reported through a *questionnaire* survey. Despite drawbacks associated with the *questionnaire*, the study used this method in order to collect information about “green” purchase practices, structure and characteristics of municipalities which tender analysis is unable to provide. Furthermore, although widespread experiences to develop GPP practices are presented in Italian regional and local authorities, possible differences among Italian regions and the focus on municipalities in Tuscany must be taken into account in case of generalization.

There are several implications of the study for policy makers and public procurement practitioners and for future research. Policy makers may need to be supported to improve the level of awareness and know-how on GPP instrument and its involvement in energy efficiency governance in the building and construction sector within municipalities. In addition, policy makers should start to consider energy efficiency as an overall objective which includes the development of GPP practices as a supporting tool in their municipality. Practitioners should employ their expertise to steer municipalities towards more cost-effective energy efficient measures in their buildings and to improve interaction with actors of supply chain in the building and construction sector. Finally, further re-

search is needed to investigate the relationship between energy management of municipal building stock and energy efficiency policy in residential and commercial buildings.

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Sustainable Procurement in Practice: Explaining the Degree of Sustainable Procurement from an Organisational Perspective

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Sustainable procurement is often used to reduce negative environmental impacts related to production and consumption. Several studies in the sustainable procurement literature have identified potential drivers of and barriers to sustainable procurement, which are often organisational in nature. Using an organisational perspective, this paper examines if and how three organisational factors – top management support, expertise and commitment – influence the degree of sustainable procurement in procurement projects in the Dutch national government. The article concludes that both organisational factors (especially commitment) and the actions of individual actors are important.

[JEL Classification: D23; H57; H83; L22; Q58].

Keywords: sustainable procurement; organisational change; organisational factors; national government.

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1. - Introduction

Since the 1980s, sustainable procurement has been applied worldwide as a mean of addressing and reducing negative environmental impacts related to the production and consumption of products (Ho, Dickinson and Chan, 2010). In 2005, sustainable procurement was high on the Dutch political agenda with the acceptance of a motion in the House of Representatives. The Dutch national government wanted to use their annual spending of more than 10 billion euro to stimulate the market for sustainable goods and services and to act as a role model. Research on sustainable procurement indicates that procurement is indeed a policy tool that can help achieve desired outcomes in society and is critical in driving forward the sustainability agenda (Brammer and Walker, 2011; Carter and Rogers, 2008; Green, Morton and New, 1998; Ho, Dickinson and Chan, 2010; Meehan & Bryde, 2011; Preuss, 2009). External pressures are often crucial in kick-starting the engagement of organisations in sustainable procurement; however, for it to become truly successful, certain organisational factors are needed (Hoejmosse and Adrien-Kirby, 2012). It is inside the organisation that changes have to be made and barriers removed to achieve the desired outcomes in society.

The sustainable procurement literature has given much attention to the identification of barriers to sustainable procurement (Ageron, Gunasekaran and Spalanzani, 2011; Bowen, Cousins, Lamming & Faruk, 2001; Erdmenger, 2003; Giunipero, Hooker and Denslow 2012; Günther and Scheibe, 2006; Meehan and Bryde, 2011; Michelsen and de Boer, 2009; Preuss, 2009; Varnas, Balfors & Faith-Ell, 2009; Walker and Brammer, 2009). According to our reading of the literature, these barriers are part of three organisational factors: commitment, top management support and expertise. Although the literature on sustainable procurement clearly identifies these factors as being influential (Meehan and Bryde, 2011; Preuss, 2009; Walker and Brammer, 2009), no attention has been given to *how* these factors actually influence the degree of sustainable procurement. This paper addresses this issue and answers the question «how do organisational factors influence the degree of sustainable procurement in public procurement projects in the Dutch national government?».

To answer this question, two cases of sustainable procurement in the Dutch national government are studied from an organisational perspective. The organisational change literature focuses on how organisational factors influence the outcomes of change initiatives. Thus, by studying sustainable procurement from an organisational perspective, it becomes possible to go beyond the identification

of organisational factors and explain how the degree of sustainable procurement is actually influenced by organisational factors.

The conceptual model is developed in the next section; in section 3, the research design and methods are discussed; in section 4, the results of the case studies are presented; section 5 concludes; and section 6 discusses future research and limitations.

2. - Theory

This section starts with a conceptualisation of the degree of sustainable procurement, followed by the introduction of the conceptual model and an in-depth discussion of three organisational factors that have been identified from the literature.

2.1 *Degrees of Sustainable Procurement*

The dependent variable in this research is the degree of sustainable procurement. The Dutch policy on sustainable procurement is based on the notion of making a certain degree of sustainability within procurement compulsory. However, project teams are asked to aim for more sustainability (non-compulsory), thus leaving room for projects to vary in the degree of sustainability. Studies on sustainable procurement in public organisations show great variation with regard to their extent and overall nature of involvement with sustainable procurement (Brammer and Walker, 2011; Meehan and Bryde, 2011, page 94). In addition, although people might verbally demonstrate that they endorse certain policies or schemes, this does not necessarily have to lead to a change in their behaviour or practice (Meehan and Bryde, 2011, page 95; Vining and Ebreo, 1990). This indicates that sustainable procurement is not a black-and-white issue. This paper focuses on what influences the degrees of sustainable procurement in procurement projects.

Sustainability is a complex and often-contested concept (Brammer and Walker, 2011). Defining and operationalising different degrees of sustainable procurement is therefore difficult. In this paper, the definition of Meehan and Bryde (2011) is used: «sustainable procurement is the acquisition of goods and services in a way that ensures that there is the least impact on society and the environment throughout the full life cycle of the product¹». Based on earlier em-

¹ Other terms that are often used to describe the same phenomenon or policy as sustainable procurement are: green public procurement (MICHELSEN O. and DE BOER L., 2009, European Commission), environmentally responsible public procurement (LI L. and GEISER K., 2005), green purchasing and eco-procurement (BOLTON P., 2008). In this research, the term sustainable procurement is used, as it is the closest match to the Dutch name of the policy (*Duurzaam Inkopen*).

pirical data and an interview with an expert, four degrees of sustainable procurement have been identified: 1. no application of the compulsory ecological criteria, 2. application of the compulsory ecological criteria, 3. ecological award criteria (not compulsory) and 4. adding value (e.g., generating electricity).

The procurement process can be considered as a special decision-making process, where project teams make decisions regarding the procurement that influences whether the full potential of sustainable procurement is used (Günther & Scheibe, 2006). Three factors are often mentioned in sustainable procurement literature as potential drivers of sustainable procurement practices within organisations: top management support, commitment and expertise (Brammer & Walker, 2011; Fernandez & Rainey, 2006; Günther & Scheibe, 2006; Hoejmoser & Adrien-Kirby, 2012; Kotter, 1996). These factors are expected to influence the decisions made by the actors involved, and they determine whether the full potential of sustainable procurement is used. These three factors are discussed in the next paragraphs.

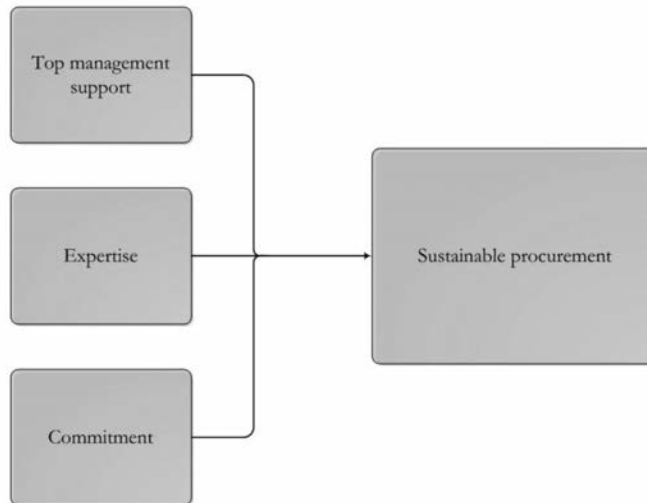
2.2 Conceptual Model

Based on a review of sustainable procurement literature, the factors commitment, expertise and top management support were identified as potentially influencing the degree of sustainable procurement. Whereas commitment and top management support are considered important factors of successful change in both sustainable procurement and organisational change literature, expertise as an influencing factor is derived from the sustainable procurement literature only.

The conceptual model below shows how these three factors are expected to influence the degree of sustainable procurement.

FIG. 1

CONCEPTUAL MODEL



The commitment of project teams engaged in procurement to embrace policy objectives or strategies is considered essential to generating the effort and energy necessary for a successful project, and it determines where an organisation places itself on the *continuum* of innovator to laggard (Herscovitch and Meyer, 2002; McLaughlin, 1990; Meyer and Herscovitch, 2001; Parish, Cadwallader and Busch, 2008; Preuss, 2009). A study of Brammer and Walker (2011, page 472) showed top management support to be a significant factor in the implementation of sustainable procurement. If managers support sustainable procurement and incorporate it into their planning, strategies or goal setting, the project teams will execute it (Brammer and Walker, 2011). In their literature review, Fernandez and Rainey (2006) state that there is considerable evidence that top management support and commitment play an essential role in successful change in the public sector. Expertise is an organisational factor that is not (yet) considered important in organisational change theory. However, several studies on sustainable procurement have shown that without relevant expertise public procurers interpret the new situation based on their old routines, which are no longer appropriate to the

situation, making traditional choices and diminishing the degree of sustainable procurement (Meehan and Bryde, 2011; Michelsen and de Boer, 2009).

2.2.1 Top Management Support

The traditional change management literature has often pointed to the pivotal role top management support plays in the implementation of organisational change (e.g., Fernandez and Rainey, 2006; Kotter, 1995; McNulty and Ferlie, 2004). Within the procurement and sustainable procurement literature, a similar role is given to top management support (Hoejmose and Adrien-Kirby, 2012). For example, a study by Brammer and Walker (2011) found leadership and management support to be critical in the implementation of sustainable procurement. If managers are supportive and incorporate sustainable procurement in their strategies or goal setting, project teams will indeed procure sustainably (Brammer and Walker, 2011). Ageron *et al.* came to a similar conclusion with regard to sustainable supply chain management; top management support is necessary and is often a key driver for successful sustainable supply chain management. The importance of top management support could be (partly) explained by the fact that top managers facilitate, ensure and deploy organisational resources to meet the goals of the organisation and individual departments (Hoejmose and Adrien-Kirby, 2012, page 236). In the public sector, top management support not only requires support from the political top but also from top-level civil servants (Fernandez and Rainey, 2006).

2.2.2 Commitment

Commitment is considered a crucial factor in determining the degree of sustainable procurement in sustainable procurement literature (e.g.: Erdmenger, 2003; Michelsen and de Boer, 2009). Without the right mind-set, purchasers will make traditional choices. Commitment is therefore a large determinant of where an organisation will be placed on the *continuum* of innovator to laggard (Hoejmose and Adrien-Kirby, 2012; Preuss, 2009).

Although the sustainable procurement literature does identify the importance of commitment of the procurers and project teams to change, little attention is given to the characteristics of commitment. Literature from the field of organisational change offers more insights into commitment to changes. Commitment is defined as a force that binds a project team to a course of action deemed necessary for the application of sustainable procurement within their procurement

project (Herscovitch and Meyer, 2002). Commitment also does not have to be present from the start; it can occur after mandated or coerced involvement at the individual or system level (McLaughlin, 1990, page 13). If public procurers are required to change their routines or behaviour, they could become committed in the process (McLaughlin, 1990).

Three different types of commitment to change can be distinguished: affective, continuance, and normative (Herscovitch and Meyer, 2002). Affective commitment is a desire to provide support for change based on a belief in its inherent benefits (Herscovitch and Meyer, 2002). An example would be a belief that sustainable procurement is beneficial for the environment. Continuance commitment is the recognition that there are costs associated with failure to provide support for the change (Herscovitch and Meyer, 2002). An example would be the recognition that not procuring sustainably could lead to hefty fines (due to breaking environmental laws) or bad press. Normative commitment is a sense of obligation to provide support for change, for example, because in many other projects in the organisation project teams are procuring sustainably. Herscovitch and Meyer (2002) demonstrated that affective and normative commitment to a change resulted in higher levels of support than continuance commitment.

2.2.3 Expertise

Sustainable procurement is a complex, often-contested concept, and it requires that public procurers have specific skills and knowledge. A lack of expertise negatively affects the effort put into sustainable procurement. According to Snell (2006), 80% of (both public and private) purchasers even lack a clear understanding of the term sustainable (Michelsen and de Boer, 2009).

Lacking an understanding of what sustainable procurement is and can do makes it difficult to see its potential, such as the potential to realise economic benefits (Bowen *et al.*, 2001). Although the organisation might request information about environmental issues in a call for tenders, this does not mean they will turn down a cheap offer in favour of a more environmentally friendly offer (Michelsen and de Boer, 2009). It also does not mean that the project team has enough expertise to draw a sensible conclusion from the received information. If the project teams lack expertise, they will have to interpret the information based on their old routines, which are no longer appropriate to the situation, causing them to make safe and traditional choices (Meehan and Bryde, 2011).

Close collaboration between project teams and environmental experts, training, national standards and templates for sustainable procurement are considered

potential solutions for a lack of expertise (Michelsen and de Boer, 2009). Although Brammer and Walker (2011) did find that training increased employee engagement with sustainable procurement, they did not find that knowledge or awareness issues had an effect on the engagement.

3. - Methods and Case Selection

In this paper, a combined case study approach was used to reconstruct the process towards sustainable procurement and to explain the difference between the degrees of sustainable procurement between the cases. A case study was deemed the best approach, as this allows us to research both “how” and “why” the degree of sustainable procurement is influenced by organisational factors. To understand how organisational factors influence the degree of sustainable procurement, it is necessary to study the process leading up to a certain degree of sustainable procurement. By combining a causal process tracing approach and a co-variational approach, we were able to trace a process that leads to a certain degree of sustainable procurement, enhancing the internal validity of the claim that the organisational factors matter (Blatter and Haverland, 2012; Gerring, 2007). Using a causal process tracing approach requires that we select our cases based on the dependent variable (degree of sustainable procurement). Selecting two cases within the same organisation allowed us to control for other organisational factors (e.g., organisational culture), while still varying on the dependent variable. Contact with policy advisors about sustainable procurement led to the identification of two procurement projects that were expected to differ in their degree of sustainable procurement. Due to confidentiality – the procurement process is on-going – not all details regarding the cases can be made public, such as the exact budget or the number of vehicles that will be procured. However, both projects are comparable in size (both are large-scale projects involving millions of euros) and are procured by a dedicated project team, and the procurement process has a duration of longer than one year. Both projects were at the same stage of the procurement project: the selection and award criteria were determined, but the actual awarding of the contract had yet to occur.

Studying how the degree of sustainable procurement is influenced by organisational factors requires multiple levels of analysis. Whereas top management support is an organisational level variable (as the top management covers the entire organisation), commitment and expertise are project level variables (as they are unique

to each project). The multilevel character of the research problem requires that we choose nested cases. Hence, a case consists of a procurement project carried out by a project team working in a procurement department that is part of a ministry.

3.1 *Data Collection*

The data collection was mainly based on interviews and internal documents concerning the procurement projects. Ten interviews (five per case) with key actors in the cases were carried out. The interviews were semi-structured. An extensive topic list formed the foundation for the interviews; however, the interviewees were given plenty of room to elaborate on matters or bring in subjects they felt were related to the degree of sustainable procurement of the project. The topic list contained questions regarding the application of sustainable procurement, commitment, the role of the top management, the existence of expertise on sustainable procurement and the implementation process of sustainable procurement. The topics were at both the project and organisational level.

Interviews were held with key actors in the projects. A snowball procedure was used to identify the key persons. Somebody was considered a key actor if he or she had a leading role in the project (e.g., project leader or procurer) or were identified as key actors (with regard to sustainable procurement) by others. In each case, the project leader, procurer, sustainable procurement policy advisors and their supervisors were considered key actors and were subsequently interviewed. Interviews were carried out until no new respondents were suggested. The interviews, on average, lasted between 1 and 1.5 hours. All interviews were recorded and transcribed *verbatim* using both a word processor and speech recognition software.

3.2 *Data Analysis*

The main data sources for the analysis were the interview transcripts. However, internal documents and publicly accessible information about the procurement projects were also studied. To facilitate the analysis process and allow for a more systematic comparison of variables in and across the cases, all the interview transcripts were coded. The transcripts were coded using Atlas.ti. The codes were based on the topic list. During the coding process, however, additional codes were added (back and forth coding). For example, when it became obvious that certain actors were considered to be driving the change, an additional code “actor driving change” was created.

4. - Results

The following sections discuss each case in depth. Each case starts with a short description of the project, followed by our assessment of the degree of sustainable procurement and the process of moving towards this degree.

The first case is the procurement of a large number of vehicles by the Defence Materiel Organisation (DMO) as a replacement for the current vehicles. The vehicles will be used in heavy terrain, but not in dangerous situations. In addition to the procurement of the vehicle itself, maintenance will be outsourced for a period of ten years. The degree of sustainable procurement varied throughout the project, starting at a second degree, falling to a first degree and eventually ended up a mix of first, second and third degrees of sustainable procurement. That the degree of sustainable procurement fluctuated throughout the project shows that the degree of sustainable procurement is a variable that can be influenced.

In the second case, the Ministry of Defence gave the Department of Defence Real Estate (part of the Support Command Shared Service Centre) the assignment to procure the design and development of a real estate project. The design and development was executed via a public tender and was awarded to the candidate with the most economically advantageous tender (MEAT). The degree of sustainable procurement increased throughout the project from a second degree (application of the compulsory criteria), to a third degree (sustainable award criteria) to a fourth degree (adding value).

4.1 *Vehicle Case*

The Dutch Ministry of Defence has highly formalised the procurement process. At each stage of the procurement process, forms have to be filled out. For example, at the beginning of the procurement project the “request to procure” form has to be filled out by the project team. To ascertain that in all procurements the compulsory ecological criteria are applied, a question on the applicability of the criteria is inserted in the form. To complete the (digital) form, the question has to be answered; not answering it will raise questions later in the process. One respondent explained, *«You can of course avoid the question, but then further ahead in the project you will get that question again. If you offer the dossier up for the financial round, you will get a “hey, why didn’t you do anything with sustainable procurement?” So sooner or later you will get caught».*

However, the project team showed normative commitment to apply the compulsory ecological criteria. The project team felt they were obligated to do so; the

organisation had committed itself to this policy and, therefore, would do what they were expected to do. One respondent explained: *«In the program of demands, we of course, this is more or less standard procedure, include the sustainable procurement criteria. This is also what happened now»*. That the project team felt they were obligated to apply the criteria is a clear indication of normative commitment to sustainable procurement, as the following quote from a project member demonstrates: *«There is no other way; it just has to be done»*.

However, when it became apparent that some of the compulsory ecological criteria clashed with the required operational uses of the vehicle, it became a different story. In exceptional situations (regarding the unique situations in which the materiel of the Ministry is used), the Ministry of Defence is formally allowed to forego the ecological criteria. The project team felt that this was the case here. They explained that the off-road usage of the vehicles prohibited the use of sustainable tyres. One respondent explained, *«I can tell you one thing, as soon as you drive into the terrain with that, you won't get very far. [..]. It requires a tread design with larger blocks and greater void, which is less optimal for the other uses. Therefore, we make concessions there. Because you have to be able to drive into terrain with it»*. Even though only 5% of the time the vehicles will be driving off road, the project team decided to forego the prescribed criteria with regard to the tyres, thereby decreasing the degree of sustainable procurement.

For some time, it appeared as though the degree of sustainable procurement would remain low. However, later during the evaluation of the formal specification, the low degree of sustainable procurement was noticed. A sustainability advisor noted that the project team had not given enough attention to the sustainability of the vehicles. One of the respondents explained, *«He pointed the sustainability aspects of the vehicle out to us. At a certain moment, he said "there is nothing about sustainability in there anymore". So we fixed that, based on his advice»*. The project team received this advice unsolicited. Project teams within the Ministry of Defence consist of generalists rather than specialists. If a project team requires expertise on a matter, they seek expertise outside the project team in the organisation. In this project, the project team did not seek expertise on sustainable procurement. They did, however, seek advice on the health and safety aspects of the formal specification. Nevertheless, the health and safety advisor not only advised them but also forwarded the formal specification to a sustainability advisor in his team. The sustainability advisor wrote a memo and pointed to a number of possibilities to increase the sustainability of the vehicles. Although the project team was not required to adopt these recommendations, they did adopt most of

them. For example, a number of tools to increase the fuel efficiency of the vehicles were introduced as award criteria for the MEAT approach. One respondent explained, «*They are also the people who point out to us what we could include in our formal specification. They often refer us to their site; I do not remember the name now. However, just a national or European site with sustainability tips that you could include in projects. We have also looked at that site. Because of that we have, next to the requirements, added award criteria. This means that if the industry offers us that, they can get extra points*». Although the project team had not solicited additional expertise, receiving it showed them possibilities for sustainable procurement that they had not realised themselves, which shows that they lacked expertise on the matter. Receiving the advice from the advisor, an expert on sustainable procurement, increased their knowledge and thereby increased the degree of sustainable procurement of the project to a mix of first and third degrees.

However, not all offers of advice were adopted. For example, the advisor suggested purchasing two types of tyres: sustainable tyres for 95% of the time the vehicles were driving on the road and high-traction tyres for when the vehicles were driving off road. This advice was not heeded. One respondent explained, «*You can't keep changing tyres. So, well, that's the choice you make. [...] This vehicle also has these kinds of requirements. And then your sustainability principles diminish a bit*». Had they followed this advice, the degree of sustainable procurement would have been higher.

Interestingly, the contact between the project team and the advisor was highly formalised. There was no direct contact between the project team and the sustainability advisor, as the two documents (formal specification and memo) were exchanged via the health and safety advisor. The project team did not even know the name of the sustainability advisor, and the advisor had no idea whether his advice was adopted by the project team. Thus, although the project team did receive additional expertise, the way this was exchanged was rather passive.

During the procurement, the top management was perceived as being silent, although the project team management required them to procure sustainably. One respondent said, «*We do get guidelines. In this procurement, we did get them, via the staff, but they are an addition to the guidelines from the minister and/or secretary general, or from the secretary of state. I do not know how it gets here. We were told to procure sustainably. They also send pamphlets about that, so it is definitely a guideline here*». However, the information they received about sustainable procurement was generally aimed at the department, and the pamphlet had been placed on the intranet prior to the start of the project. It can thus be concluded

that the top management was not actively involved in this project and was neither supportive nor unsupportive.

In the end, nearly all compulsory ecological criteria were applied. The project team showed a normative commitment to apply the compulsory ecological criteria as long as they did not clash with the operational requirements of the vehicles. However, in these situations the Ministry is allowed to forego the compulsory criteria due to the specific usage of their material. Therefore, the project team felt that they were allowed to forego the criteria. The degree of sustainable procurement was increased after receiving expert advice on the sustainability of the vehicles. They had not sought after additional expertise themselves, as they felt that they had enough expertise. However, when the expert advice showed them other possibilities, they did feel compelled to adopt this advice and include fuel efficiency tools as award criteria for the MEAT approach.

4.2 Real Estate Case

The initial assignment and preparations for the real estate project started a long time ago. Unfortunately, cutbacks stalled the project. After a number of years, the project team received approval to start preparing for the tender again. Many documents had to be rewritten, as circumstances and guidelines had changed since the initial start of the project. However, this made it possible to include new ambitions. Soon after the restart, the project team decided that they wanted to include sustainable award criteria in the MEAT approach, thereby increasing the degree of sustainable procurement. One respondent explained, *«In this case we, as a team, had already come up with that idea, and we as a team were supporting using that. And to not just go for the minimum criteria, but use sustainability as award criteria»*. The project team itself had the ambition of reaching a high degree of sustainable procurement, thus showing affective commitment to sustainable procurement in this project.

Shortly after the project team decided to include sustainable award criteria, a sustainable procurement policy advisor from their department approached them. Within the infrastructure sector, a joint initiative from several public organisations called “sustainable infrastructure” had been launched. The superior of the advisor has a seat on the board of directors of the initiative and would soon chair a meeting on sustainability. They wanted to show that the Ministry of Defence had put sustainable procurement high on the agenda and were looking for a pilot project. The advisor explains: *«We just really want to do it! Of course, I could write more about it, but we also needed actual projects. Therefore, we started to look for projects.*

I also asked around in our regional offices. At a certain moment, a head of technique in one of our regional offices approached me and said "this might be a good project". So, I went down to talk to the project leader. We also had a "sustainable infrastructure day". We organised this in June, and I invited him to come, to see what it all meant». During this day, the director of the advisor also spoke to the project leader. The director stated, «I find it important to be there at that moment. To show people "hey, the management team of the real estate department finds this important", and to support the frontrunners».

Both the advisor and his superior were actively trying to get more people involved in the sustainable infrastructure initiative. Each of them was trying to achieve this at their own level. Whereas the director was working with directors from other organisations to develop the sector-wide initiative, the advisor was trying to spread the initiative within the department. The director explains, «Well, you always have frontrunners and boosters within the policy department. You always have boosters and people who have that task within our Defence Real Estate Department. My advisor is one of them, and I consider it my task as well to do that». He explained that he could do this more easily because of the sector-wide initiative: «For me it is also easier to convince my principals. Showing them that we are doing it together with other public organisations and the market. If you do it together, you get a lot more done than when you're trying to draw attention by yourself». As the project team had already decided to include sustainability in their MEAT approach, they agreed to become a pilot project for the sustainable infrastructure approach.

Because the project is a pilot project for the sustainable infrastructure approach, building and sharing the expertise gained through this project is an important aspect of the job of the advisor within the project team. By organising workshops, presentations and writing pieces on the intranet, he tried to increase the expertise of the civil servants working in the department on sustainable infrastructure. Later on in the project, the project team became actively involved in the attempts of the advisor to make the department more knowledgeable about the sustainable infrastructure initiative by giving presentations at a workshop organised by the advisor to spread their newly acquired expertise. However, the advisor is also using the experience from the pilot as input for the new version of the Defence Sustainability policy, for which he was asked to write a number of chapters. Thereby, the advisor not only influenced the degree of sustainable procurement within this real estate project but also the degrees of procurement of future real estate projects.

Not only did the affective commitment of the project team influence the degree of sustainable procurement, but later on in the project a personal initiative from a technician working for the project also directly increased the degree of sustainable procurement. This technician wanted to reuse excess electricity and reduce electricity spillage and costs. One of the respondents explained: *«So they transport the excess electricity back to the electricity grid. How simple can it be? It is very reasonable. However, it was one person who stuck his neck out for it. [...] He just felt that way. Moreover, in the end, he made it feasible. We were going to need some extra cables, but it turned out we were able to change the function of leftover cables in the ground, and they could reuse existing underground high-voltage cables on the terrain for the transportation of the electricity»*. The technician also showed affective commitment to sustainable procurement by developing a plan on how the project could add electricity (and thereby value) rather than waste it.

The project team indicated that their direct supervisors were not always supportive of their sustainability ambitions and plans. One respondent explained, *«Well, it might be indirectly, but you're still being slowed down. Despite all the ambitions you might have for a project, you are the one who has to realise it. So, the challenge remains yours at all times. And if you stick your neck out, you are also the one who has to make sure it doesn't get chopped off»*. The support from the top was more mixed. On the one hand, the project team felt that the top was neutral about it and were communicating about other matters, but on the other hand they also received indications that they were supportive. For example, one respondent said, *«Well, that is quite difficult to answer, because I've actually never heard anybody in the top mention anything about it»*. Another respondent mentioned a top manager who heard about their project and asked them to write an article about it for their internal magazine: *«Yes, one of our national directors asked us to do that. He asked us if it was not possible to do that. Earlier I said that our national organisation supports it, and this surely happens via this director»*.

To conclude, throughout the project the degree of sustainable procurement was increased from a second degree to a fourth degree of sustainable procurement. The increases in the degree of sustainable procurement can be related to the affective commitment of the project team. A sustainable procurement advisor tried to increase both commitment and expertise about sustainable infrastructure, for example, by inviting them to workshops. Later, the project became actively involved in the workshops to spread their newly acquired expertise. The top management was perceived as silent, although one top manager did show support for their high sustainability ambitions in the project.

4.3 *Cross Case Comparison*

In the previous paragraphs about each case, the process of their degree of sustainable procurement was discussed. To explain what (might) have caused the differences in the degree of sustainability, the cases need to be compared. In the following paragraphs, first the dependent variable (degree of sustainable procurement) is compared, followed by a cross-case comparison of the independent variables.

4.3.1 Degree of Sustainable Procurement

The dependent variable “degree of sustainable procurement” varied both during and across the cases. In the end, the real estate case had a higher degree of sustainable procurement than the vehicle case. The real estate started at a second degree of sustainable procurement (application of the criteria); with the decision to include sustainable award criteria, the project reached a third degree of sustainable procurement. Initiatives later in the project increased the degree even further when it became possible to transport excess energy back to the electricity grid and thereby add value to the environment. The vehicle case started at a second degree of sustainable procurement. However, when certain compulsory ecological criteria clashed with the operational requirements of the vehicles, the degree of sustainable procurement decreased. After receiving unsolicited sustainability advice, sustainable award criteria were added (third degree), and the degree of sustainable procurement was increased to a third degree.

4.3.2 Top Management Support

With regard to sustainable procurement, in both cases top management was perceived as silent. Respondents felt that the top is communicating about other issues. This is no real surprise, as both cases share the same top management. However, in the real estate case the project team also felt that the top was neutral and were communicating about other matters. On the other hand, they also received indications that the top was supportive of their initiative to achieve a high degree of sustainable procurement. A top manager who asked them to write an article about the initiative is an example of this support. It can be concluded that the top management is generally perceived similarly in both cases. However, in the case with the highest degree of sustainable procurement there was a positive comment from an individual top manager about their project. Nevertheless, it is unlikely that this factor caused the difference between the degrees of sustainable procurement because the perceptions of the top management are too similar.

In Walker and Brammer's (2009) research, top management support was the most frequently cited facilitator of sustainable procurement. This support was considered crucial for the incorporation of sustainable procurement in procurement processes and procedures and in government policy. In our two cases, sustainable procurement had already been incorporated into government policy and the internal procurement procedures (e.g., the digital procurement form), and the top management had committed themselves to it. Perhaps this is an indication that top management support is important in the beginning at the organisational level (to incorporate it into the organisation), but once this is arranged the degree of sustainable procurement is further affected at the project level by other factors and individual actors.

4.3.3 Commitment

In both cases, the respondents showed commitment to sustainable procurement in their projects. However, the type of commitment did vary across the cases. In the vehicle case, the project team showed a normative commitment to sustainable procurement, whereas the project team of the real estate case showed affective commitment. The sustainability advisors and supervisors involved in each case showed similar commitment. In the vehicle case, the advisor and supervisor showed normative commitment, and their counterparts in the real estate case showed affective commitment.

If the type of commitment is linked to the degree of sustainable procurement, we see that in the case with the lowest degree of sustainable procurement the project team has a normative commitment. However, in the case with the highest degree of sustainable procurement, the project team has affective commitment to sustainable procurement. This is an indication that it is not merely the existence of commitment that matters; the type of commitment is also important. A closer look at how the degrees of sustainable procurement were reached explains this fact. Normative commitment is about feeling obligated to a change rather than believing in the change itself. Comparing the cases, we see that in the vehicle case very little attention to sustainable procurement was paid until an advisor pointed it out to members of the project team. When they received his advice, they felt an obligation to adhere to it, but had they not received it they would not have had the drive to ask for it themselves. This is the opposite of what happened in the real estate case. There, the project team had already set their ambitions high with regard to sustainable procurement. Prior to their contact with the advisor

and throughout the procurement process, their actions were driven by their inherent belief in how their project would benefit from a higher degree of sustainable procurement, even if it meant putting in more time and energy.

It can thus be concluded that the presence of affective commitment (in these cases) can be related to a higher degree of sustainable procurement. It appears that normative commitment does not have the same effect. This is an important addition to existing studies on sustainable procurement and commitment (Michelsen and de Boer, 2009; Walker and Brammer, 2009) that found commitment to be an important factor, but did not distinguish between different types of commitment.

4.3.4 Expertise

In both cases, the project teams consisted of a number of generalists rather than specialists. In the vehicle case, this tendency is heightened by the fact that a number of project team members are military personnel that are reassigned to a new department every couple of years. If the project team requires expertise on a matter, they seek it outside the project team, but inside the ministry. The type of experts that can be consulted is diverse and ranges from technicians and engineers to lawyers. In the real estate case, at least 27 other civil servants from the ministry assisted and advised the project team.

In both cases, the project teams received expertise from a sustainable procurement policy advisor, and in both cases the advisor approached the project team rather than the other way around. However, the way the expertise was shared was vastly different between the cases. In the vehicle case, the project team had requested additional expertise on the health and safety aspects of the vehicles and additionally received (unsolicited) advice on sustainable procurement. Although they had not requested the advice, upon receiving it they learned that there were a number of ways in which they could increase the sustainability of the vehicles. Had they not received this advice from the expert, they would not have included it in the procurement, and thus, the project team would not have sufficient expertise on sustainable procurement and the expert could not have pointed out several additional sustainability options. The contact between the expert and the project team was highly formalised. The project team and advisor did not meet, call or e-mail; they only exchanged formal documents. The advisor did not even know whether the project team had taken up his advice.

This was vastly different in the real estate case, where a sustainable procurement expert also contacted the project team. However, unlike the vehicle case,

this case was a pilot for a sustainable infrastructure approach and was part of a larger learning process. The sustainable procurement policy advisor organised a meeting, presentations and workshop to educate the entire department on the possibilities of sustainable infrastructure and real estate. At the beginning of the project, the advisor focused on increasing the expertise of the project leader and project team, for example, by inviting them to workshops. Later in the project, the project team itself gave presentations during a workshop organised by the advisor to share their (newly) acquired knowledge about sustainable procurement to their colleagues. The project team had gone from sustainable procurement apprentices to experts.

The project teams were not experts on sustainable procurement in either case. During the real estate case, however, the project team learned much and became involved in spreading their newly acquired expertise. However, there are no indications that a difference in the degree of sustainable procurement between the cases can be explained by the level of expertise of the project team. Thus, looking at the three factors in the conceptual model, only (affective) commitment appears to be a determinant of the degree of sustainable procurement. This conclusion, however, seems too simple; something else appears to be at hand here.

4.3.5 The Importance of Actors: The Change Agent

Fernandez and Rainey (2006) found considerable evidence that top management support and commitment play an essential role in the success of change initiatives. These two organisational factors were included in the conceptual model. However, only affective commitment appears to be a determinant of the degree of sustainable procurement in these two cases. Moreover, when we compare the process descriptions of the two cases the importance of individual actors becomes apparent. The actions and attitudes of the two actors were especially prominent in the real estate case. This supports the view of Fernandez and Rainey (2006), that change agents can play an important role in commitment and top management support. The change agent is defined as an individual who influences clients' innovation decisions in a direction deemed desirable by a change agency (Rogers, 1995).

The director and his supervisor can be identified as change agents who were actively trying to implement a sector-wide initiative on sustainable infrastructure within the Defence Real Estate Department. The director was a linking pin between the board of directors of the sector-wide initiative and the Defence Real Estate Department. He tried to implement the ideas and plans from the sector-wide

initiative in the Defence Real Estate Department. He also supported the actions of the advisor, for example, by talking to the project leader of the real estate case to convince him to become a pilot project for the sustainable infrastructure approach. The advisor is more focused on implementing the approach within the organisation itself. He is not only approaching project teams to ask them to become pilot projects but is also trying to educate the department about the possibilities of sustainable infrastructure as well as institutionalise it in the organisation by making it part of the new organisation-wide Defence sustainability policy. In the vehicle case, a sustainable procurement advisor was also involved. However, his role was passive and focused on giving advice one project at a time, whereas the advisor in the real estate case is actively trying to change the entire department.

With regard to the degree of sustainable procurement, the change agents were responsible for getting the project team involved in the sector-wide initiative and including a number of tools as award criteria that would greatly increase the sustainability of the project. The three factors (top management support, commitment and expertise) can all be related to the actions of the change agents. With regard to top management support, the director felt that top management support was necessary for them to be able to implement the initiative. In his efforts to convince his superiors of the necessity of the approach, he felt backed by his fellow board of director partners in the sector-wide initiative. Although he also perceived the top as silent on the matter, they were giving him permission to use resources to implement the approach and take part in the sector-wide initiative. Both change agents stated that they needed enthusiastic people in procurement projects to help them implement the initiative, and their actions were aimed at increasing the commitment. To increase commitment, the advisor, for example, organised workshops, meetings and presentations and wrote articles for both the intranet and the internal magazine. Sharing expertise and increasing the expertise of the department, with regard to sustainable procurement and sustainable infrastructure, was one of his key activities. Thus, by increasing the expertise of people within the department, about the possibilities of the sustainable infrastructure initiative, he also tried to increase their commitment. This could be an indication that expertise is a moderating variable rather than an independent variable.

It can be concluded that in the case with the higher degree of sustainable procurement there were two people acting as change agents. In the other case, such actors could not be identified. The actions of the change agents were oriented at the three organisational factors within the conceptual model, indicating that the existence of these factors is not static but can be influenced by active change agents.

5. - Conclusion and Discussion

In the literature on sustainable procurement, much attention is focused on identifying factors that pose barriers to sustainable procurement. However, little attention is paid to how these factors influence the degree of sustainable procurement. In this paper, we tried to fill that void by using an organisational perspective to answer the question of how organisational factors influence the degree of sustainable procurement in procurement projects in the Dutch national government. Based on our empirical results, we can draw three conclusions.

First, the causal process tracing showed that the degree of sustainable procurement fluctuated during both procurement projects. This shows that the degree of sustainable procurement is not static and, even late in the procurement process, can be increased or decreased. In organisational change literature, several scholars have noted that paying too much attention to single change events prohibits the identification of clear insights (Kuipers *et al.*, forthcoming; Pettigrew, 1990). Thus, a process approach is crucial to understanding how the organisational factors and the degree of sustainable procurement are related.

Second, our analysis indicates that affective commitment indeed appears to be a determinant of the degree of sustainable procurement. For the other two factors, such a conclusion cannot be drawn. The factor top management support did not vary enough to state that it can influence the degree of sustainable procurement, nor showed the causal process tracing an increase of the degree of sustainable procurement of the real estate case after the positive remark of the top manager. In both cases, the project team lacked expertise and received advice from a sustainable procurement policy advisor. Although the degree of sustainable procurement increased after the project teams received advice from sustainable procurement policy advisors, this cannot explain the differences in the degrees of sustainable procurement. Simply concluding that only affective commitment is a determinant of the degree of sustainable procurement is too simple and brings us to our next conclusion.

Third, although the process tracing approach showed that the organisational factors matter, it also became apparent that individual actors play an important role in determining the degree of sustainable procurement. In the case with the high degree of sustainable procurement, two important actors were identified. These actors were actively trying to increase commitment, expertise and top management support for a sustainable procurement initiative. The actions of the change agents were aimed at all three organisational factors: increasing individual

commitment, expertise and top management support. This is in line with Fernandez and Rainey's (2006) conclusion that change agents can play an important role in commitment and top management support in change initiatives. By increasing expertise, they wanted to increase the commitment of individuals, which could be an indication that expertise is a moderating variable rather than an independent variable. In the case with the lower degree of sustainable procurement, such actors could not be identified. In this research, the process approach uncovered the importance of actors in determining the degree of sustainable procurement.

6. - Future Research and Limitations

This study, as any study, has its limitations. However, these limitations can serve as stimuli for future research. We will discuss two important limitations. First, the results of this study and the outlined implications should be interpreted in light of the limited scope of the research. Studying sustainable procurement in two cases within the same organisation allowed us to control for many variables. Nevertheless, selecting two cases within one organisation has its limitations. For example, only the perceptions by project team members of the top management could vary across the cases, as the top management is similar for both cases. Therefore, more research in multiple public organisations and with more expected variance in the independent variables is necessary to fully understand the relationships amongst organisational factors, actors and the degree of sustainable procurement.

The second limitation is inherent to the case study method. A case study is performed to understand how and why certain things occur rather than to test relations between variables and generalise them and therefore has consequences for the external validity of this research. The results of this study are specific to the cases, but provide some interesting possibilities for future research.

First, existing studies of drivers of sustainable procurement acknowledge the importance of commitment, but do not make a distinction amongst different types of commitment. Our study has shown that the type of commitment matters and influences the degree of sustainable procurement. This requires further study of both the relationship of the different types of commitment and the degree of sustainable procurement in more cases, as well as identifying determinants of affective commitment. However, understanding what determines affective commitment to sustainable procurement is needed to further stimulate sustainable procurement.

Second, our research shows strong indications of the importance of individual actors in determining the degree of sustainable procurement. Based on their actions, certain individuals could be identified as change agents and played a role in increasing the commitment and expertise of their co-workers. However, more insight into the roles of actors in determining the degree of sustainable procurement by acting as a change agent is needed.

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A Holistic Approach to Developing Existing Building Commissioning in European Public Real Estate

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Recently, the global market is struggling with one of the most critical economic crisis to have ever occurred. The solution is to attack the weak chain links effectively, focusing on specific targets rather than use capitals thoughtlessly. Therefore, it is necessary to introduce and follow more effective methodologies in each field of application, towards a general effort to move out of the crisis. In this paper, the authors analyse the field of Facility Management, in particular the improvement of buildings conditions and performance through Building Commissioning, to provide proof of its concepts effectiveness, presenting a new way of application.

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Keywords: commissioning; real estate; facility management; facility condition index; public procurement.

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The continuous and long-lasting international crisis is provoking tangible effects in both people's life and businesses' outliving. In this particular economic-historical moment, for what concern the real estate range and the facility management, it becomes crucial to be able to manage limited financial resources as better as possible, optimizing people productivity and preserving, at the same time, their health and safety conditions (Cesarotti - Di Silvio, 2006). In addition, the increasing attention towards environmental preservation is generating additional constraints for maintenance operations and energy management aspects. Therefore, the optimization of building efficiency is becoming a must for most of the companies. This is generating a potential demand for Existing Building Commissioning (EBCx), a well-known, strengthened methodology, which allows to obtain all the mentioned requirements through the application of operations and maintenance best practices. By applying these techniques, service companies can increase their strength and capacity of acquiring contracts from external sources. This has a particular relevance in the public sector, in which the available capitals have dramatically dropped in the last few year, due to the worldwide crisis we are going through. As a matter of fact the benefits have general impacts, because outsourcing non-core activities to specialized agencies, allows companies to focus on their primary business, *de facto* potentiating the markets themselves. This will be a key factor that will help to overcome the problems and watch beyond the crisis in the very closest future.

1. - Introduction: What is Commissioning

Existing Building Commissioning is a "whole-building" or "total building" process in which building systems and their interactions are tested and verified to suit current requirements (BCA, Building Commissioning Association). This integrated approach maximizes positive results and helps to ensure that the building is operated safely, efficiently, and meets the Current Facility Requirements (Commissioning for new and existing buildings, 2010).

The Building Commissioning Association defines EBCx as «a systematic process for investigating, analyzing, and optimizing the performance of building systems through the identification and implementation of low/no cost and capital intensive Facility Improvement Measures and ensuring their continued performance. The EBCx process assists in mak-

ing the building system perform interactively to meet the CFR and provides the tools to support the continuous improvement of system performance over time». (BCA)

According to the definition, the main purpose of this methodology is to verify that a building and its systems are working correctly, considering their age and the common usage they have been submitted during the occupancy. In some cases, if the building conditions are not suitable for the use for which it was originally arranged, it is necessary to implement a whole series of activities for its re-constitution:

- Identify and resolve building system operation, control and maintenance problems;
- Reduce or eliminate occupant complaints and increase tenant satisfaction;
- Improve indoor environmental comfort and quality and reduce associated liability.

Also, there is a series of support activities that can increase the productivity and the general preservation of a building, which include the creation of a detailed documents archive to report and monitor the building situation and the personnel training for O&M procedures. In other cases, when the building status has been properly maintained, it may be sensible to improve the building performance by saving energy and reducing operational costs, in order to extend the equipments life-cycle and increase the whole asset value. Building commissioning introduces a fundamental paradigm shift from the price-schedule dimension to a quality-focused dimension. To building owners, the bottom line cost savings can be dramatic. Savings in energy costs can be between 20 to 50 percent, maintenance and operational savings can be between 15 to 35 percent (Tseng, Facility Engineering and Management Services).

A building is an investment: poor performance means a loss of money. Building Commissioning is one way to keep this money in your pocket, can restore an existing building to high productivity (Lopez M.W., 2000).

Buildings are “productivity engines”. A poorly performing building and its systems directly impact the “bottom line” and the “mission” for which the building was built in the first place. By redefining buildings as “productivity engines” in which value is added, net profit is generated, and unnecessary costs avoided, owners will come to view quality in a very different light. A higher performing building with a smooth functioning

HVAC system produces a higher level of productivity by its occupants. This fact is especially important in today's concern over indoor air quality (Dorgan C. - HVAC&R Center in Wisconsin).

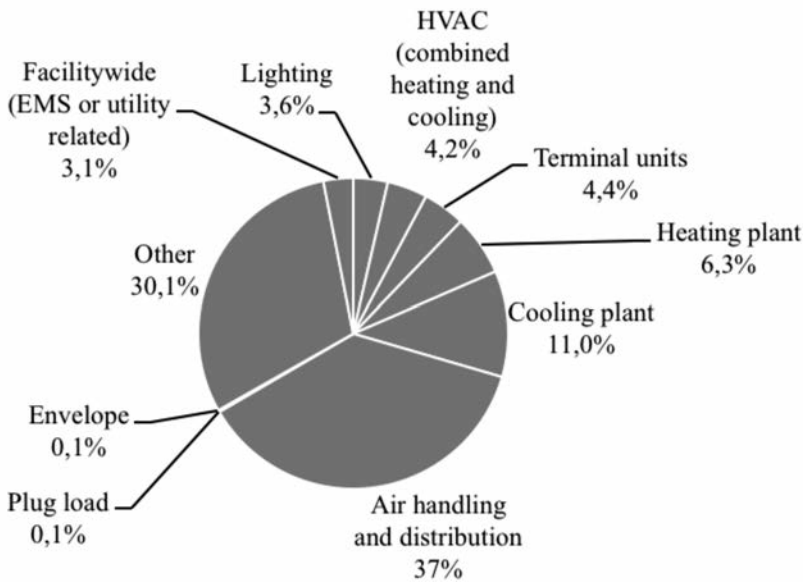
It is possible to distinguish several typology of EBCx processes, according to the kind of building they are applied to (Innovative Facility Solutions Inc., 2009). Generally, it takes the name of *Retro-Commissioning* when it looks at how and why building's systems are operated and maintained as they are, and then employs a systematic process of investigation, analyzing, and optimizing the performance of building systems. As a process, rather than a set of prescriptive measures, Retro-Commissioning adapts to meet the specific needs of each owner. If the Commissioning process involves buildings that have been previously commissioned (during construction) or retro-commissioned, it is called *Re-Commissioning*. This kind of Commissioning process is normally performed every three to five years, or whenever the building experiences a change in use. In *Ongoing-Commissioning*, monitoring equipment and trending software is left in place to allow for continuous tracking, and the scheduled maintenance activities are enhanced to include operational procedures. For Ongoing-Commissioning to be highly effective, the building owner must retain high quality staff or service contractors that are trained and have the time and budget to not only gather and analyze data, but also to implement the solutions that come out of the analysis. Perhaps, it is important at this point to highlight that Commissioning a building means ensuring the persistence of the improvements over the entire building's life. This requires the involvement of all the building stakeholders, including senior management, engineering, O&M personnel, contractors, vendors and facility users (Cesarotti – Spada, 2009). All these players indeed will receive benefits in return from the Commissioning process.

According to what said so far, a Commissioning process can be considered successful when a building operates as efficiently as possible, meets the owner's operating requirements, and includes strategies to ensure last over time. Because there are no industry standards for Commissioning work scope, building owners and managers engage the process for a variety of reasons. First of all, the obtained performance improvements of the building can reduce the costs of employee absenteeism and other productivity losses related to worker discomfort and complaints. Research has been completed to document the link between comfort and productivity, as common sense tells us that comfortable employees are more productive than uncomfortable employees. Moreover, good working conditions and

good performance of the systems can be repaid even more in long term period in rented facilities. Unsatisfied tenants for continuous complains tend to move to other buildings, and this turnover can be very costly in terms of loss of rent, building imagine and contractual fees. Another direct benefit obtained by performing the building through routine and productive maintenance is that its equipments life is extended and equipments repair costs are lowered, with a reasonable increase of assets value. If this concept is applied to industrial facilities, by ensuring that equipment performs optimally and efficiently, commissioning can also help reduce equipment downtime and improve production rates, resulting in general process productivity increase. These improvements have effect even in better energy utilization, reducing related costs and placing the building itself to an higher environmentally friendly standard (Cesarotti, Di Silvio, Introna, 2009). Below are shown the most common Energy system deficiencies (Graph 1) that can be attacked with Commissioning activities.

GRAPH 1

ENERGY SYSTEM DEFICIENCIES

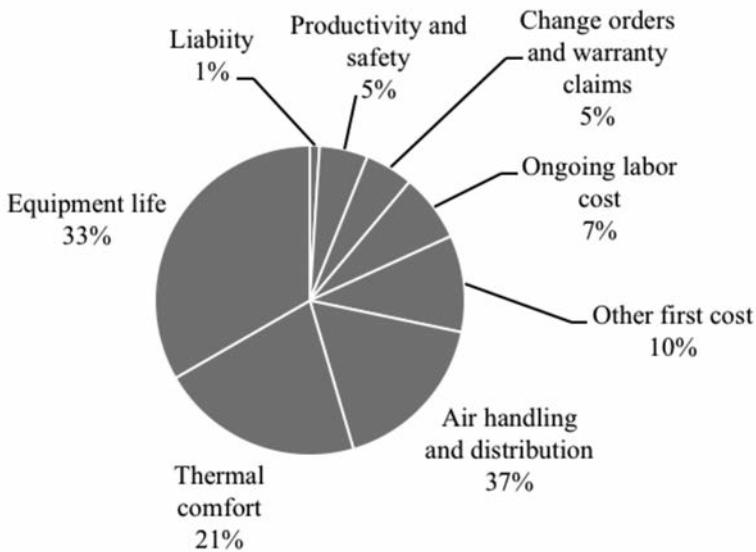


Source: Lawrence Berkeley National Laboratory, Portland Energy. Conservation Inc., Energy Systems Lab Texas A&M.

In addition, there are other non-energy benefits that is possible to obtain through building Commissioning. For instance, O&M capabilities are enhanced by involving the operations staff in the process. This synergy can both lower the cost of a successive Re-Commissioning initiative and gives building operators a more comprehensive understanding of the whole facility. Building documentation improvements are also a natural outflow of a detailed performance improvement process: locating and organizing documentation commonly takes some effort, but is essential to ongoing building operation. A well-designed operations plan encourages documentation libraries be maintained for quick reference, efficient validation processes, successful audits, expedited repair/replacement and ongoing operator training. Few examples will be shown later on this paper, to highlight both energy and non-energy related benefits, summarized in the next chart (Graph 2).

GRAPH 2

ENERGY AND NON-ENERGY BENEFITS



Source: Lawrence Berkeley National Laboratory, Portland Energy. Conservation Inc., Energy Systems Lab Texas A&M.

2. - Background: Few Examples of the Commissioning Process Application

Building Commissioning is a relatively new approach, which has been considerably spreading and growing in the last decades, especially in North America (Building Commissioning Association). In the late 70s, public works in Canada begin to use Cx in their project delivery system. Its effectiveness was clear since the beginning, so that the new methodology promoter, engineer W. Dunn, was called in the US to manage the construction of new prototype buildings in Tallahassee. Seven buildings later the state was building the most energy efficient buildings it has ever had in less time and for lower costs, and was getting more useable floor space and higher occupant satisfaction. The commissioning worked so well that with each new building the state cloned, quality continued to rise while costs and construction time continued to fall. On the last building there were over 50 different improvements they made from results learned on the previous buildings (Lopez, 2000).

In the early 80s, other companies started to apply those techniques: the most famous case is Walt Disney World's, during its major expansion era (Odom, 1997). The company was struggling with several building failures during the construction phases, resulting often in serious opening delays for the new attractions. The adopted Commissioning approach was able to invert the situation, giving the company the ability to improve building performance while simultaneously not impacting project cost and schedule. Consequently, the importance of Commissioning started to appear evident, so that its related topic begun to be studied and offered in some University courses. Moreover, some of the most important building technology societies, including ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) and BPA (Bonneville Power Administration, federal agency), started to develop the first Commissioning guidelines, in order to highlight and standardize the best practices for the implementation.

During the 90s, Commissioning started to focus its attention on energy-related aspects, as they became fundamental requirements for most of the companies in both private and public sectors. During these years indeed, companies started to move their attention towards energy management approaches, seen as an unexplored area for cost savings. Obviously, the spreading of new environmental policies had a primary role in this orientation. In addition, employees condition grew to be the centre of attention, so H&S aspects were also examined in depth. New guidelines for Commissioning were released, and their application revealed an

incredible number of deficiencies. Some of them included higher-than-average carbon dioxide levels in one room, air balance problems that affected thermal comfort, economizer wiring problems, intake of fireplace smoke from adjacent buildings and inaccurate as-built documents. To solve the situation, Commissioning agent focused on energy, operation and training issues, which result to be the common drivers for most of the cases. It is clear that during these years Commissioning process started to attack with more emphasis existing building as well, in order to convert them to more efficient working places. Also, the Commissioning process results have been added to a continuous growing number of certifications as proper requirements, and some benchmark tools have been developed to track the obtained benefits and trace their over-years lasting.

At the doorstep of year 2000 and recently, the Commissioning approach continued to grow and prosper through a long series of scientific publications, more precise and accurate certifications, conferences and courses for advanced qualification. This extended its application overseas, in Europe, where new difficulties to overcome appeared. Here indeed, the historical and artistic world heritage and the different authorities regulations established a new set of boundaries to building qualification and refurbishment. The complications are even more when public buildings are involved, due to the limited budgets available. To overcome these limits, it is necessary to determine what level of commissioning is best and more cost-effective for each project.

2.1 The Classic Commissioning Approach

Certain type of equipment require less commissioning, under most conditions, than others: there are no hard and fast rules for determining the ideal level of commissioning (PECI, Portland Energy Conservation Inc., 1997). Generally, the level of commissioning detail is dictated by the complexity of the systems and controls installed. The more complex the project, the higher the risk of systems not performing as intended. Systems that are considered “complex” have sophisticated controls and control strategies, complicated sequences of operation, and a high degree of interaction with other systems and building equipment. Moreover, every facility is different, every building owners and occupants have specific performance needs. Accordingly, every building can require a different set of activities and determining how much Commissioning is enough is not an easy task, as it depends on a quite extended range of variables: the complexity of the whole building, its type and size, its usage, the available budget and resources, building tenant or oc-

cupancy demographics (Commissioning for new and existing buildings, 2010).

Generally it is possible to distinguish two levels of Commissioning (Peci, 1997). Level 1 commissioning is less expansive, and thus often less expensive, than Level 2 commissioning. However, it also provides less performance assurance. Owners and commissioning agents must find the proper balance between cost and level of service before beginning the commissioning process.

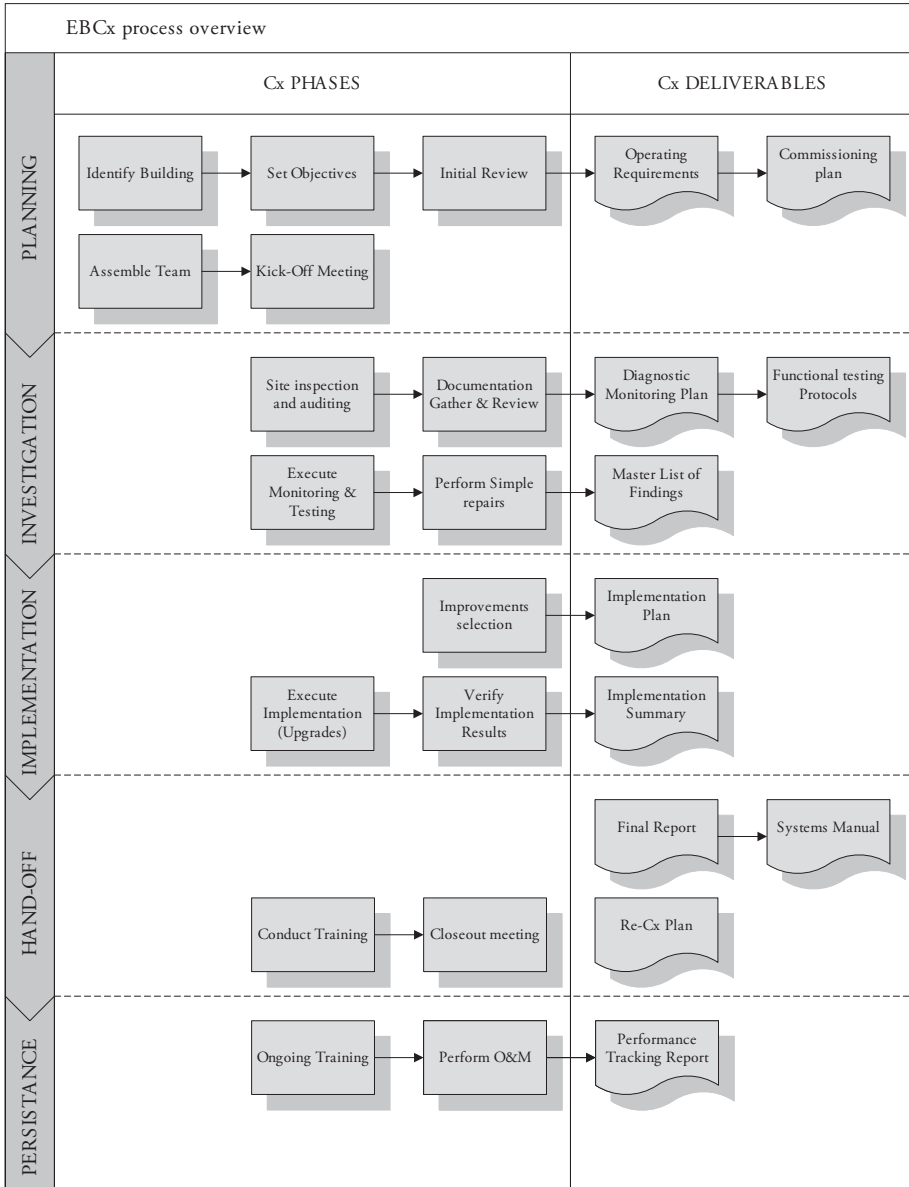
The Commissioning process is generally structured in four distinct phases (Haas - Heinemeier, 2006):

- *Planning*. At this point the first task is to define Commissioning goals and objectives, the facility requirements are identified and a Commissioning plan of action is developed;
- *Investigation*. A first field inspection is performed, in order to understand its condition, gathering data, testing and analysing the equipment to accurately assess the system performance and identify improvement opportunities. The deliverable released is the master list of findings, which summarise the obtained information;
- *Implementation*. This phase correspond to the actual execution of the improvement plan. The scheduled activities are performed and the performance are verified and reported;
- *Turnover or Hand-Off*. After the building improvement, it is essential to close the activities in the final project report. In addition, it is very important to extend the facility acquired knowledge to a designed O&M team, which will be in charge for commissioning persistence. Training sessions will be necessary to standard the operating practices, before completely closing the project.

In literature, these are the common phases for Existing Building Commissioning. Nonetheless, it is possible to identify also another phase, which will connect a classic Retro-Cx approach to Ongoing-Cx, in order to obtain a more consistent solution for the building. This additional phase is termed *Persistence* or *On-Going* and its aim is to keep building conditions updated, reviewing all the documents continuously and releasing their new versions accordingly (Harrel, 2012; Miller and Santhanakrishnan, 2008). Also, the personnel formation is another crucial aspect of this stage, in which advanced refresher courses are performed. This allows to keep people in sync with the updates, so that the building can have the most appropriate and efficient maintenance support. The following chart summarise the Commissioning plan, showing for each step the main activities, and highlighting the associated deliverables (Figure 1).

FIGURE 1

COMMISSIONING PROCESS APPLICATION STEPS



3. - The Commissioning Proposed Methodology

Due to the always more important necessity to mitigate project risks, providing high performance assurance, and keep activities cost as low as possible, it is crucial to overcome the barriers between the two different levels of Commissioning described above. In this section the authors present a new approach to Commissioning, which links the different phases together with a stronger relationship, using a well-known monitoring index to organize and execute the Commissioning plan in a more efficient way, considering the available budget for operations and setting different priority levels to the activities. In addition, the method allows to analyse various scenarios, in order to evaluate different solutions and make decision proactively.

The first step of the method, as it happens in traditional Commissioning process, is to certify the state of a group of facilities. For this purpose, a team of professionals often apply those analysis process typically called Facility Condition Assessment (FCA). Generally this team is including engineers, architects and skilled-trade technicians, who can count on high expertise and know-how, to precisely understand the actual status of the inspected facility. If accomplished on buildings, it may also take the name of Building Condition Assessment (BCA). This analyses are generally performed using mathematical-simulative models, which can represent with high accuracy the real assessed components, in order to generate projections of their life cycles. In fact, based on the age, design, construction methods and used materials, maintenance level and environmentally friendly standard, the goal of BCA is to develop the proper Commissioning plan to attack any emerged deficiency and extend each component duration, improving the whole building condition itself. Moreover, as technology advanced, FCA Modelling became the most effective way to make a building *full efficient*, in terms of costs, energy savings and maintenance.

This entire phase is facilitated by the utilization of Condition Indices that summarize all the obtained information in synthetic values, which are easy to analyse and to apply in the developed mathematical models. A good example of a facility metric that can be generated by the FCA is the Facility Condition Index, or FCI. The FCI can be further used in the development and usage of Building Information Modelling for existing buildings. Based on that, a first rough Commissioning plan is defined, dividing the activities into three main categories.

- *Compliance*: contains all the activities related to legal and regulatory aspects, as those connected to Health and Safety policies, to assure occupants condi-

tions of work, or linked to critical documentation, to assure the company conformity to government regulations.

- *Productivity*: in this area are included those activities to keep and improve the performance of the building, maintaining its components, and applying renovations oriented towards energy-saving policies and environment safeguard.
- *Business*: contains all the activities related to the company *decorum* and secondary improvements image-related.

This classification is fundamental to prioritise and schedule the operations correctly, as will be explained further in this paper. For example, according to the available budget, it results more important to focus on Compliance activities rather than Business ones, because the first guarantee the survival of the company in the immediate future while the others have a softer and longer term impact on the building and the occupants. The plan is realised considering the Life Cycle Cost (LCC) of the single components, estimated throughout the site inspection. The LCC refers to the total cost of ownership over the whole life of the component, including financial, environmental and social costs of the asset. The primary benefit of this approach is that maintenance, operation and disposal costs become important variables in decision-making, and allow managers to consider the effects that the actions to be taken might have on the residual life of the asset. During the BCA, the team of experts has to take in consideration the global site conditions, the historic performance of equipments and materials, if recorded, the effective monitoring techniques and systems, and the past maintenance intervention-strategies. By doing so, it would be possible to develop the Master List of Findings, reporting the current building situation and the suggested improvements to apply in terms of lacking maintenance and environment/energy-oriented solutions. Based on the information acquired, it is possible to realise the plan, dividing the operations in ordinary maintenance activities and extraordinary maintenance activities. The first set gather together all those actions to be performed constantly on the building equipment, according to the regulations. The second cluster is composed of those activities planned on the base of open projects, which will include major refurbishments and improvements of the facility. Moreover, the document needs are then defined for each building, based on the actual technical consistency and the analysed level of the existing documentation in comparison with mandatory regulations.

The main output of the LCC analysis is the Facility Condition Index (FCI) of the equipments. This indicator is crucial for the approach, because it allows to compare strictly and immediately the relative condition of a group of components

and, if aggregated, of a group of systems. Since the 90s, the FCI has been recognized as the most reliable parameter for assessing the state of preservation of an asset (Di Giulio and Perciaccante, 2011), being used as a standard benchmark for numerous public and private companies. Mathematically, the index is defined as the ratio between the total cost of recovery and the cost for replacing the asset (Rush, 1991)

$$\text{FCI} = \frac{\text{Maintenance, Repair and Replacement Deficiencies of the Facilities}}{\text{Current Replacement Value of the Facilities}}$$

which, translated in economical terms, results as

$$\text{FCI} = \frac{\text{Budget for Repairs (Total expenses)}}{\text{Assessed cost of Substitution}}$$

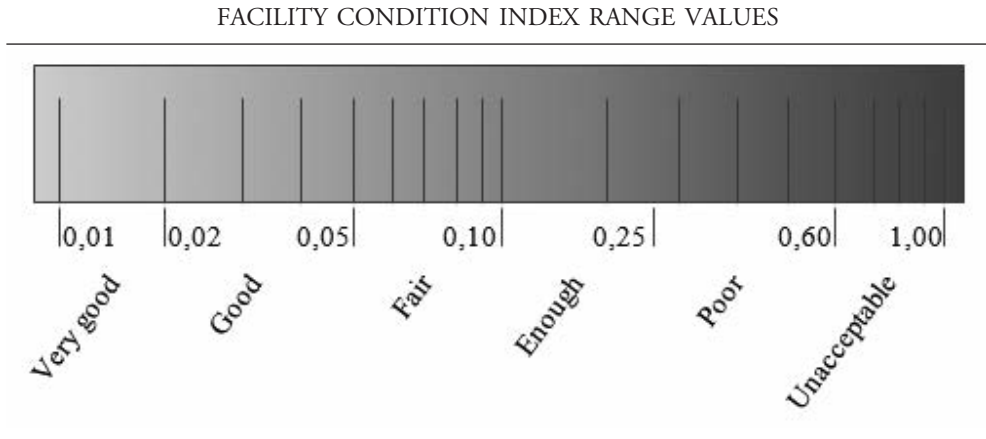
$$\text{Budget for Repairs (Total expenses)} = \text{Budget for Repairs (Current expenses)} + \text{Budget for Repairs (Capital expenditures)}$$

The highlighted values are defined as follows:

- *Budget for Repairs (Current expenses)*: are those expenses linked to programmed and recurring activities, which have a short temporal extension, necessary to the ordinary maintenance of the building.
- *Budget for Repairs (Capital expenditures)*: in this category are included all the major investments linked to the administrative/financial sector, which move part of the capital between two different assets, in order to maintain or to increase the value of the facility.

This link between the physical dimension and the economic one is easily understandable, as obviously a new component presents a reduced number of failures compared to an old one, resulting in lower maintenance expense, and *vice versa*. Therefore, the FCI is an indicator that states the functionality condition of the represented asset. Indeed, the number of maintenance activities is directly proportional to the age of the component, up to the worst case of its substitution (FCI = 1). So, an equipment is as close to its perfect usage conditions as its FCI tends to zero (Figure 2).

FIGURE 2

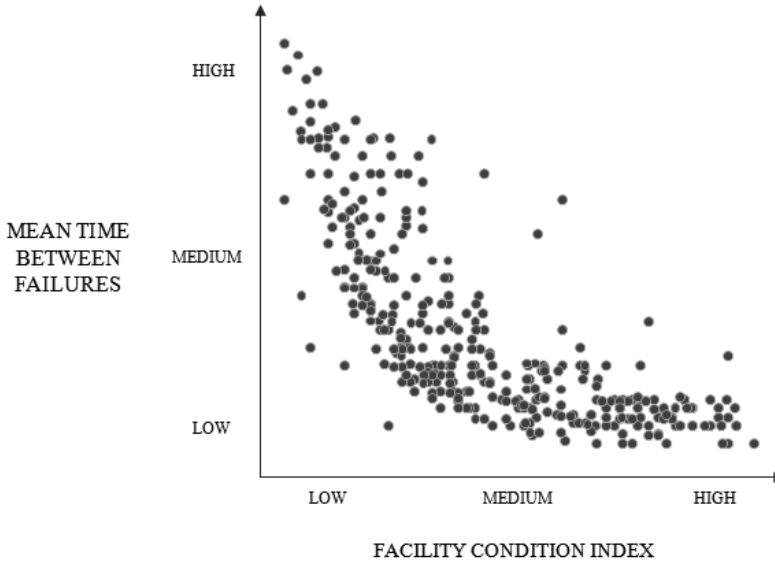


Source: National Association of College and University Business Officers, 1991.

This suggests a strong relationship with another well-known maintenance index, the Mean Time Between Failures (MTBF), developed to calculate machineries availability in industrial contests. If applied to buildings, or independently for its components, it represent the mean time that occurs between two different maintenance requests. Specifically, analysing a set of data of 800 branches, it appeared that for low values of FCI, high values of MTBF were obtained, and *vice versa*. What was interesting is that comparing the two indexes into a correlation analysis, it was possible to highlight an inverse, hyperbolic dependence between the variables (Graph 3). This allows to focus the investments on those buildings which have the highest ratio between condition improvement and operating expenses, to determine precisely those facilities to dismiss, because too expensive to manage, and to plan the best maintenance strategies according to the exact building requirements.

GRAPH 3

CORRELATION ANALYSIS BETWEEN FCI AND MTBF INDEXES



Coming back to the mathematical expression of FCI, to evaluate the numerator of the relationship, it is necessary to highlight the formal calculation procedure.

- The necessary inputs are three values: the *Item Age*, its total *Useful Life*, intended as the theoretical life the facility is expected to last, and the *Current Replacement Value*, which indicates the actual market price to substitute the facility itself.

It is possible to calculate the *Deterioration Rate* of the item as follows:

$$\text{Deterioration Rate} = \frac{\text{Item Age}}{\text{Item Useful Life}}$$

that express the physical conditions of the item. Observing the economical meaning of this index in parallel, it can be expressed with the *Depreciation Rate* of the component during its life and usage.

- Depending on the obtained value, it is possible to correct the rate considering the component life cycle, obtaining the *Deterioration Rate Factor* (Table 1).

TABLE 1

DETERIORATION RATE ADJUSTMENT

Deterioration Rate	Deterioration Rate Factor
0 % - 35 %	0
35 % - 66 %	0,10
66 % - 90 %	0,45
90 % - 100 %	1

Source: National Association of College and University Business Officers, 1991.

The table provided follows the famous concept of the bathtub curve, in which there are high failure rate values at the beginning and in the end of a component life cycle. However, due to the warranty certificates generally provided by suppliers for the components themselves, the failure probability of the initial stage is covered, and therefore the factor assumes a null value.

- Multiplying the Deterioration Rate Factor with the Current Replacement Value, the result is the *Depreciated Replacement Cost*, useful to obtain the *Cost for Renewal*, or *Budget for Repairs (Total expenses)* using the following relationship:

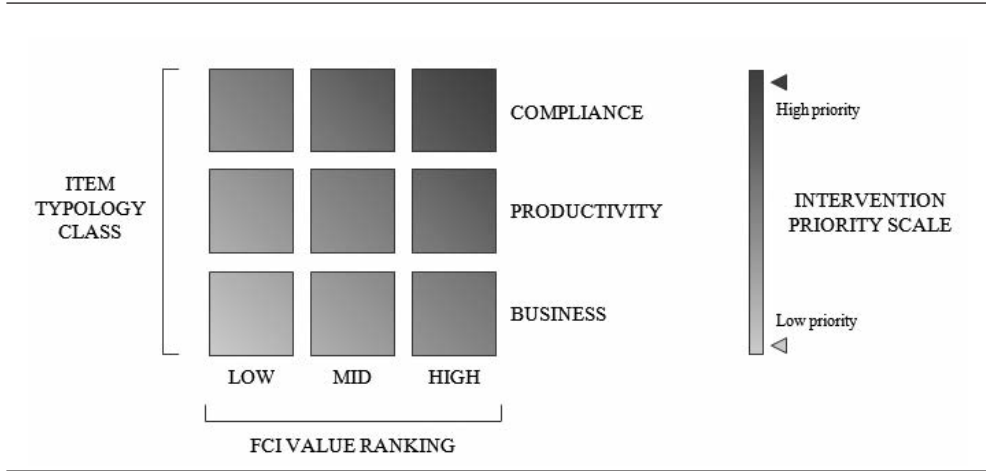
$$\text{Cost for Renewal} = \text{Current Replacement Value} - \text{Depreciated Replacement Cost}$$

So, it is possible to calculate the FCI index and classify the item according to the reported ranking (Figure 2).

Once obtained the FCI values for all the items of the facility, it is possible to proceed with their aggregation to obtain the FCI for the whole system, meaning the value within the single components. This allows to have another partition of the items, based on their actual condition. Linking this new set of information with the previous classification of the activities, based on the typology of operation, it is possible to build a matrix to resume and organise the necessary actions to improve the performance of the building (Figure 3). This matrix clearly shows the priority of the activities, allowing a better interventions management, maximising the benefits and lowering the costs.

FIGURE 3

OPERATIONS PRIORITY MATRIX



As previously introduced, the most important set of activities, which have an immediate impact on the building conditions, is identified by the Compliance module. This set allows to understand if the analysed facility is conform to the regulations and if it meets the internal company policies. The purpose of this module is to minimize non-fulfilment risks, avoiding expensive penalties which could compromise the financial performance of the company, both from economical point of view and from imagine-related aspects. Managing Compliance activities is an important mechanism that supports effective governance. Compliance with regulatory requirements and the organization’s own policies are a critical component of effective risk management. Monitoring and maintaining compliance is one of the most important ways for an organization to maintain its ethical health, support its long-term prosperity, and preserve and promote its values. On a more practical level, a compliance program supports the organization’s business objectives, identifies the boundaries of legal and ethical behaviour, and establishes a system to alert the management when the organization is getting close to a boundary or approaching an obstacle that prevents the achievement of those objectives. In order to achieve these goals effectively, efforts to comply with regulatory requirements must be supported by appropriate IT systems, that guarantee an on-going monitoring of the situation and the related activities. Regulatory compliance can be a daunting challenge, but it is also an opportunity to establish and promote operational excellence throughout the entire organization and significantly improve the overall operational performance.

If Compliance activities assure the company prosperity, sustain building occupants rights and improve their work conditions, on the other hand, Productivity activities can enhance the building situation in another way. In this module indeed, are listed all those activities to maintain the components working state and introduce a series of upgrading to make the building itself more efficient, in terms of energy production/consumption, and pollution and waste emissions. As profit maximization is clearly linked to costs reduction, from the specific point of view of a building this emphasizes the crucial role of energy within the costs framework of a company (Cape Hart, Turner and Kennedy, 2002). Moreover, a company which is effective in terms of energy management results more flexible in the market, being able to promptly react to sudden scenario changes quickly and painlessly. This can be obtained in different ways, for example by searching for cheaper sources of energy in the suppliers market, minimizing wastes of energy into the systems, using the appropriate technology from the energy point of view, stocking energy from renewable sources. In addition, it is necessary to adopt protective policies towards the environment in order to reduce pollution, for instance, through the control of CO₂ emissions. Also the wastes management is another important improving aspect, which can be achieved through best facility management practices and distribution optimization.

For what concerns the Business module instead, the activities contained in this class are those related to the *decorum* of the company, so that when improved, they give the building innovative functionalities and a better aesthetic. These achievements are not applicable only to properties of particular historical, artistic meaning, but also to normal buildings. The main improvements obtained have to do with the new appearance that the building assumes towards other companies in the same market, towards the community, and also towards the occupants of the building themselves. These changes have impacts only in the long-term future, so their application priority is lower than the priority of the other categories.

Once the operation and maintenance plan is released according to the priority scheme presented, by using a simulative-monitoring tool it is possible to observe the FCI trend throughout the facility life. This is an effective system to track the situation of the facility along the time, and to better predict the critical conditions of every single components. In addition, through the use of this application the items degradation can be considerably reduced, because a better maintenance organization highlights those components in mutual relationship. As previously mentioned, indeed, the approach is based on the fundamental concept of analysing the items as part of the whole system, not standing alone. Preventing

problems on a group of interconnected facilities increases the availability of every single component. According to this principle, another focal point of this approach is that the plan itself can be improved. In fact, having an extended visibility of the interventions to perform, it is possible to rearrange them in a more efficient way, in order to conserve resources, reduce wastes and increase the intrinsic FCI values. For example, after the first release of the action plan, based at first blush on the priority matrix, it may happen that two closely linked components would be treated in two different time windows, *de facto* creating inefficiency in terms of operations. This may occur because the model is based on theoretical mathematical abstractions. However, when used meticulously, the model offers the opportunity to better plan each single action, by merging similar activities in a more logical manner, anticipating or postponing them from their initial schedule, strategically. In general, this phase can be realised following different paths of thoughts, because they can depend on many aspects, such as the internal policies of the customer receiving the service, or the resources availability, both in terms of time and budget or in terms of physical boundaries to overcome.

The results of the planning improvement are evident, even only observing the progress of the FCI factor along the time. In fact, its trend assume a smoother and linear pattern, symptom of the fact that the system is degrading in a more controlled way and at a reduced rate. Even the extension of the life of the entire building states clearly, since the final FCI value is lowered in comparison to what previously observed. Moreover, according to the FCI trend, it may be possible to simulate different scenario, in which analyse what can occur if the major refurbishments or the minor activities are changed in comparison to the optimal schedule generated. This gives more robustness to the approach, and allows the managers to react in a more flexible way to unexpected situations.

4. - Results: The New Methodology Application

Due to the increasing number of regulations and need for operational transparency, organizations are increasingly adopting the use of consolidated and harmonized sets of compliance controls. This approach is used to ensure that all necessary governance requirements can be met without the unnecessary duplication of effort and activity from resources. In an experience with EniServizi, the Facility Management division of the public company ENI, Compliance activities were performed through a detailed analysis of the satisfied regulation require-

ments and implementing a summary dashboard to organize and show in detail all the critical elements to attack. After releasing an intervention plan, an integrated system was developed to monitor the improvements progress in real time, by using a mobile technology during on-site operations. The system was provided of a detailed database reporting all the components life cycle and their condition during the surveys. Moreover, all the relevant documentation related to those components was included in the database, and it was accessible through the mobile application from the technicians when required. This allowed more effective and quick operations, reducing error possibility and mitigating the associated risks. The operations results were then automatically uploaded on the dashboard, in order to highlight the status of the plan and the complete fulfilment of regulations requirements. Even the documentation upgrade became automatic, saving time and improving its archiving. In this way, the information were constantly updated, showing all the uncovered requirements. This allowed the continuous tuning of the plan, creating customised risk-analysis models to improve the quality and the time of the actions. In addition, further interventions are about to be applied to attack the Productivity-related aspects, in order to improve other areas of customers facilities.

Further good results were obtained in another application of the method, in a case study developed with the European Space Agency. The customer required a detailed analysis of its buildings condition, providing an accurate and efficient interventions plan to prevent the deterioration and maintain their functional effectiveness. After an accurate audit of the buildings structure and their situation, the life cycle was estimated for each component, calculating their FCI values. Also, a condition rating was assigned based on specific criteria, establishing the exact priorities for the intervention in a range from 1 to 4. Based on the priority matrix of the model, it was possible to structure the Commissioning plan for the buildings (Graph 4) and the FCI values were consequently analysed. As it is possible to observe, the plan is not optimized, as it has been obtained applying the method passively. In addition, the graph shows the following information about the FCI trend:

- After each activity of extraordinary maintenance, in which the physical conditions of the components are drastically improved, the FCI index registers a decrement on the chart;
- The general degradation of the building is highlighted by the increasing trend of the pattern.

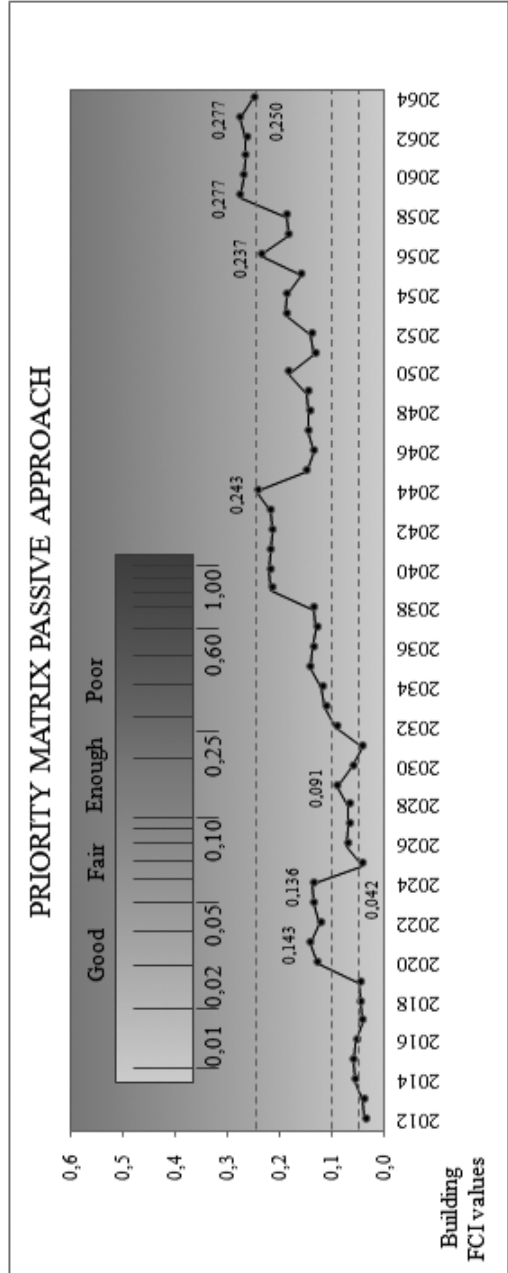
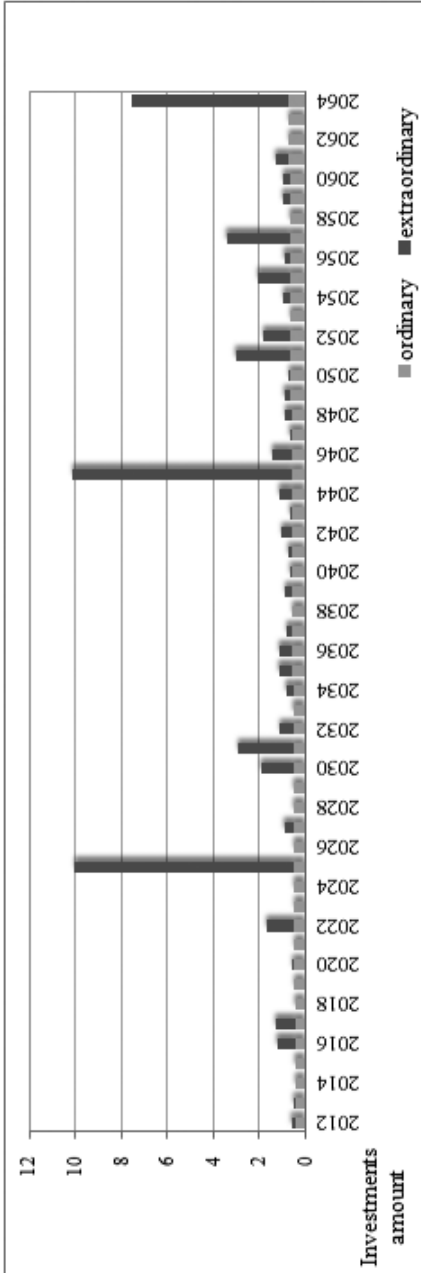
The plan was then improved as previously described, following two main drivers for the activities rearrangement:

- The FCI value had to be kept within a range of *Fair*, allowing it to fall into the range of *Enough* just before the refurbishment periods;
- According to the specific request of the customer, the major refurbishments investments had to be concentrated in 15-years cycles.

This gave rise to a new version of the plan, in which the more critical activities (priority 1 and 2) were anticipated and the recommended activities (priority 3 and 4) were deferred respect to the previous schedule. While rearranging the interventions over the years, dependencies among different activities were also considered, in order to save time and resources. Also, an optimized maintenance politic was adopted, reducing for instance preventive maintenance to those components which would have been renewed soon. This led up to a progressive reduction of maintenance expenses, due to the criticality of each single equipment, within the last four years between major refurbishments. The new active-Cx plan was then released, showing how consolidating major refurbishments actually worked on the FCI values, and consequently on the facility condition along the years (Graph 5). In fact, the FCI trends confirmed what expected, showing up as lower in the ranking (better conditions) and with a smoother pattern, which indicates higher control on the building status. Moreover, the final condition of the building appeared to be better than in the original plan. The benefits of the approach is demonstrated even by possibility of performing different *ad hoc* scenario analysis, specifically developed for the customer, to simulate, for instance, the delay of major renovations due to lack of budget available (Graph 6) or their total removal from the plan, performing ongoing maintenance on the systems.

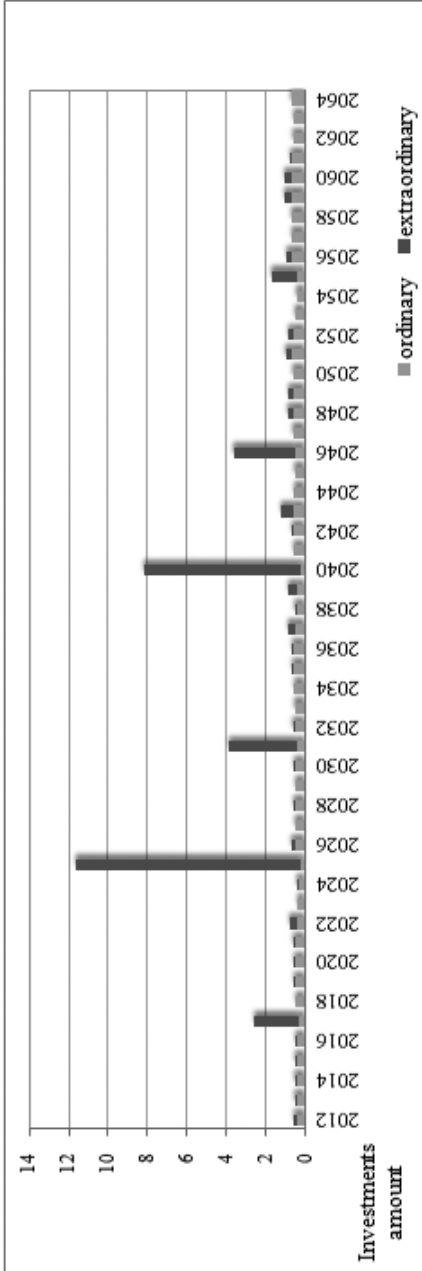
GRAPH 4

ORIGINAL COMMISSIONING PLAN (COMPUTED ON THE PRIORITY MATRIX)

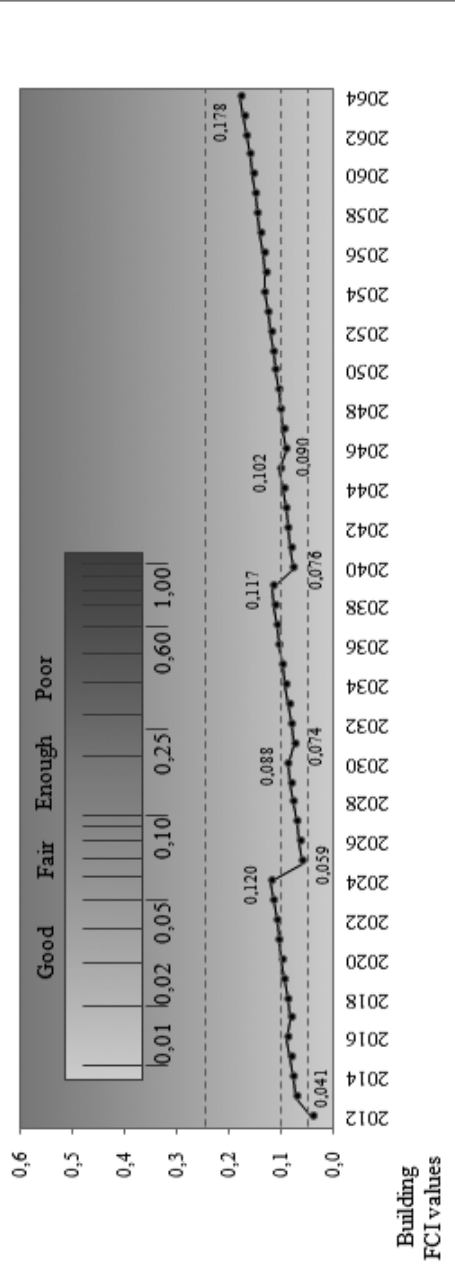


GRAPH 5

OPTIMIZED COMMISSIONING PLAN (MAJOR OPERATIONS REARRANGEMENT)

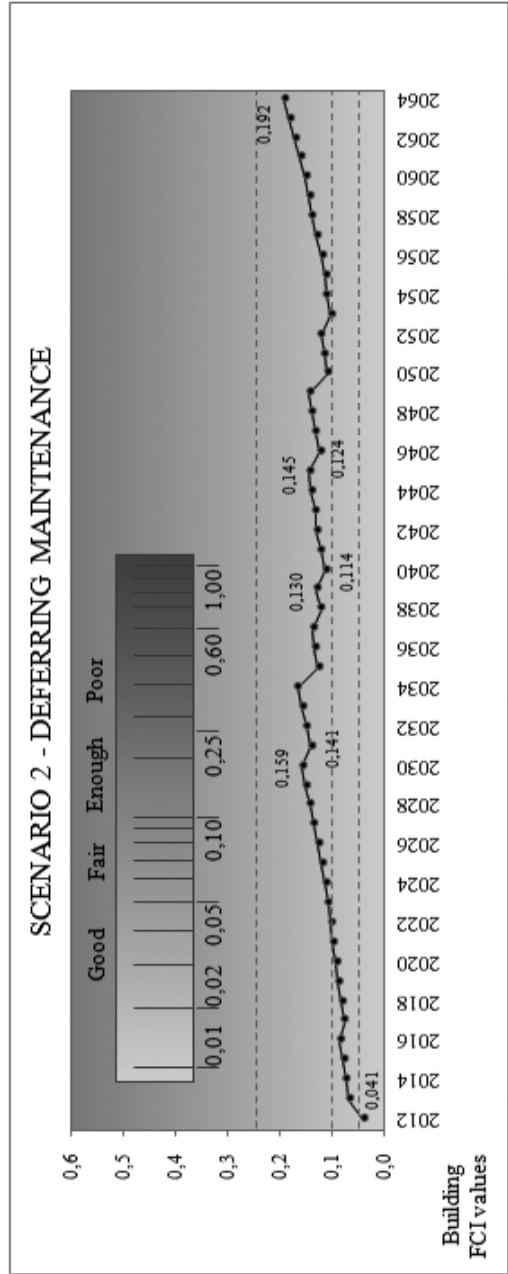
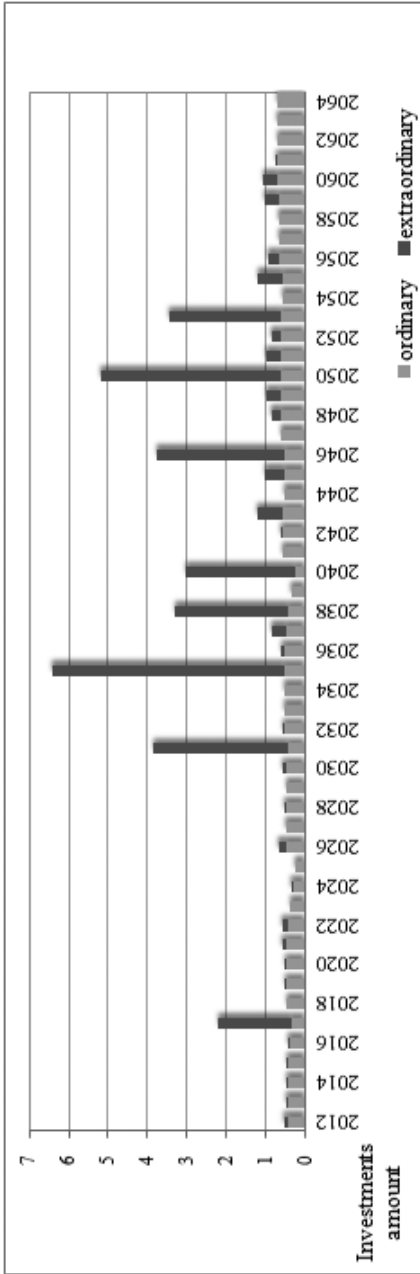


CONSOLIDATING MAJOR REFURBISHMENTS



GRAPH 6

SCENARIO ANALYSIS DEFERRING THE MAJOR REFURBISHMENT IN YEAR 2025 AND 2040 (AN EXAMPLE)

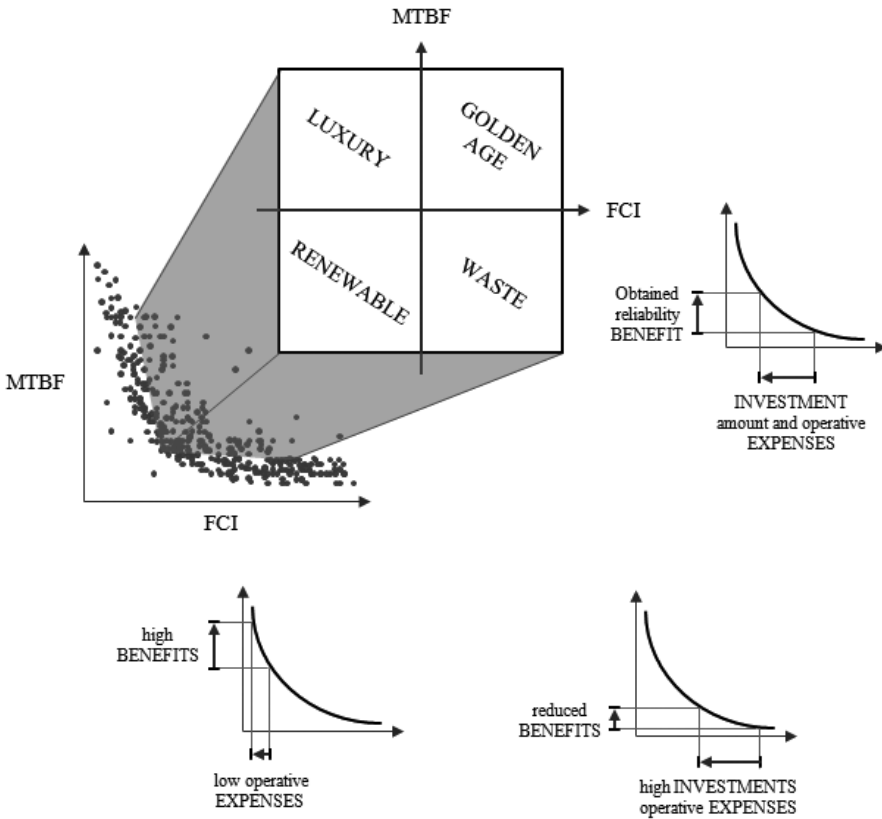


5. - Implication for Public Procurement and Conclusions

The correlation study mentioned above states a key aspect about the effectiveness of the EBCx methods. In fact, by using the correct evaluation parameters during the assessment phase, it is possible to concentrate efforts where necessary, maximizing results and reducing the sustained expenditures. Considering the pattern of the correlated FCI and MTBF, indeed, it is possible to classify the various buildings into different categories (Di Giulio, Perciaccante, 2011), each of which needs certain types of strategies from the point of view of investments and corrective actions to be applied (Figure 4).

FIGURE 4

COMPANIES CLASSIFICATION ACCORDING TO THE FCI MTBF
CORRELATION ANALYSIS



Luxury buildings present high values of MTBF and low values of FCI (between 0% and 5%). In this class are contained relatively new buildings or facilities that received important or total refurbishments in the immediately previous past. These do not require substantial investments as characterized by a high grade of reliability and conservation of the plant components.

On the opposite side, the Waste cluster includes those facilities with low MTBF values and an FCI close to 100%. Due to the analysed pattern, renew these buildings is not economically convenient, as they require huge investments obtaining just low benefits in terms of reliability. This means that the appropriate strategy to follow for this class is to dismiss the whole facilities and build or move to new ones, obtaining better payback horizons and drastically changing the FCI ratio.

The Renewable set is composed of those buildings with an optimal FCI value, even if subject to frequent requests of intervention. In spite of relatively low investments and an appropriate and effective plan of action, it is feasible to achieve significant improvements on the maintenance-energetic status of the buildings and maybe move them to the Luxury class. In fact, their current condition is probably related to wrong investments of previous management. At last, in the Golden Age category it is possible to find buildings with limited number of intervention requests, although characterized by an high FCI value. This means that the equipments efficiency is still high, even if their renewal requires high investments. Due to their inevitable obsolescence increase, these buildings are driven to occupy the Waste quadrant.

Once these observations are clear, it appears evident that management complied with the actual requirements of a specific building are better than others that do not consider these aspects. The use of these techniques is crucial for market competition, as it allows to identify those suppliers that make better use of the available resources, lowering wastes. Therefore, it is directly consequent that adopting EBCx approaches allows companies to manage contracts and allocate budgets in a more suitable way, resulting an higher overall performance and an improved level of service. This has a significant effect on the facility management service procurement, as outlines a grading scale of the same companies operating in this sector (performance merit ranking). In addition, these considerations have a particular relevance in the public sector, where there are even bigger limitations on the accessible funds, and the risk of a failure is not tolerable, as it reflects to an even more extended and vulnerable population. For these reasons, the need of an higher efficiency through the use of structured methodologies becomes cru-

cial, underlying the importance of companies rating and their accurate selection. One possible solution is to improve the purchasing processes, enhancing the tendering stage by including EBCx application evidences to the choice factors. This may require an undeniable effort at the beginning, although it is inevitable to pursue the desired objective, and to promote fair and open competition among suppliers in this light. A correct and potentiated evaluation phase of suppliers at the end of each contract may help at this point, through the elaboration of supplier scorecards that outline the company level in terms of Commissioning. After a trial period, it will be possible to rely upon a reasonable picture of the suppliers market situation, and being able to make correct choices consequently. If the global market system is able to manage this ranking effectively, the acquisition of a greater number of contracts by the top companies not only guarantees an enhanced meritocracy level, but also it assures the reduction of not justified costs, impacting significantly on the public debt decline, and pushing on the continuous research of innovative solutions and best practices.

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II - INNOVATION PROCUREMENT

Public Procurement for Innovation in Small States. The Case of Latvia

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Policy-makers in the EU have recently increasingly emphasised public procurement as a policy instrument to stimulate innovation. Public procurement is seen as an instrument able to fill in the gaps in the existing innovation policy-mix, thus helping to maintain competitive advantage of EU Member States in global competition. Public procurement has been widely covered in research, however, its application in a context of a small state has remained largely uncovered. This paper thus aims at bridging this gap, by analysing the potential smallness-related constraints to implementation of public procurement as a policy instrument. The empirical part introduces the case study of Latvia.

[JEL Classification: H57; L53; O25; O31; O38].

Keywords: public procurement; innovation; small states; Latvia; case study.

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1. - Introduction

This paper concerns the role of public procurement as an innovation policy instrument, which has been increasingly emphasised over the last decade by both academics and policy makers (see e.g. Georghiou, 2007; Commission, 2009; House of Lords, 2011). Using public procurement as a multi-objective policy instrument is, however, anything but new (see e.g. McCrudden, 2004). Similarly, Japan, France, Germany, the US, and Sweden, among others, have used public procurement as an instrument of industrial policy, supporting development of industries ranging from military aircrafts in Sweden (Eliasson, 2010), to hearing aids (Lotz, 1992), with different degrees of success (see Overmeer and Prakke, 1978). Perhaps, some of the most notable examples of the effects of public procurement on innovation originate from the US: diffusion of micro-processing technology, creation of the Internet, as well as development of the Global Positioning System (Cabral *et al.*, 2006; Ruttan, 2006).

Since the early 2000s, with the recognition that the 3 per cent target for research and development (R&D) expenditure cannot be attained with the standard policy measures, policy makers in the European Union (EU) have been increasing their focus on the demand-side instruments, where public procurement has been seen as an instrument with high impact potential. “Innovation Union” initiative serves a clear example of this shift in thinking about innovation policy-making. There, particular emphasis is put on the necessity for a more strategic approach to innovation policy, including strategic use of massive procurement budgets of the EU member states, which amount to some 17 per cent of the EU’s gross domestic product (GDP). Beside the possible positive effects of public procurement for innovation (PPFI) on innovation in the private sector, procurement of innovative goods and services can also bring about significant improvements in the quality and efficiency of public services when the public sector faces significant demand for its services, as well as substantial budgetary constraints (see EC, 2010). Public procurement of innovative goods and services has recently been also suggested as a policy instrument complementing the policy mix within the framework for national or regional research and innovation strategy for smart specialisation (Foray *et al.*, 2012).

In this paper, public procurement of innovation is defined as all “purchasing activities carried out by public agencies that lead to innovation” (Rolfstam, 2012, page 5). This definition allows including all stages of procurement process that contribute to innovation, from pre-procurement phase up to the procurement evaluation stage

after the formal tendering process has been concluded and the contract has been delivered. This definition also takes into account all possible types of innovations (*i.e.* product, process, organizational, marketing) as well as the role public procurement can have throughout the life-cycle of the product or service procured (*i.e.* from pre-commercial procurement through to diffusion, market consolidation and includes market destruction phases of the life-cycle) (Rolfstam, 2012).

The impact of demand-side activities of the public sector, including public procurement, has been widely discussed, providing both case-study (see *e.g.* Rolfstam *et al.*, 2011; Rolfstam, 2006; Lember *et al.*, 2011; Yeow *et al.*, 2011) and survey-based (*e.g.* Aschhoff and Sofka, 2009) analyses. The role of both formal and informal institutions as enabling or retarding factors in implementation of PPFi have also been discussed and analysed (see *e.g.* Rolfstam, 2006, 2009; Rolfstam *et al.*, 2011). There is however still a certain gap in understanding of the implications that the country size has on implementation of PPFi as an innovation policy instrument (with an exception for Georghiou *et al.*, 2010).

Prior to the last two waves of European enlargement in 2004 and 2007 respectively, the EU was clearly dominated by a small number of comparatively large states (*i.e.* Germany, France, Spain and Italy), with a few smaller ones (*i.e.* Denmark, Finland, Belgium, Ireland, etc.). However, with enlargement towards East and accession of twelve Central and Eastern European countries (CEECs), the balance shifted considerably. Small states, at least quantitatively, constitute the dominant majority, thus pointing to the need to integrate the issues of small states into the demand-side innovation policy debate.

There is no consensus on whether smallness of a particular state should be defined on the basis of geographic, demographic, economic, institutional or resource-based parameters, or some combination of thereof (Smith *et al.*, 2005). However, despite the differences, the literature suggests that there is a consensus that size matters and small states all face similar challenges in international relations, as well as in economic development (see Neumann and Gstöhl, 2006; Steinmetz and Wivel, 2010). The relational understanding of smallness provided by Steinmetz and Wivel (2010, page 7), suggests that

«...being a small state is tied to a specific spatio-temporal context, not a general characteristic of the state. A small state is not defined by indicators such as its absolute population size or size of GDP relative to other states. Instead, a small state is defined by being the weak part in asymmetric relationship».

This definition provides the necessary flexibility to apply the concept of “smallness” to Latvia as the subject of the case study suggesting a flexible approach to policy making, allowing the definition of a specific set of policy-related problems, and defining particular spheres where the notion of smallness is important (*ibid.*). By looking at the factors peculiar to the context of small states, this paper aims at identifying the possible size-related constraints on the way to successful design and implementation of PPFi, thus expanding the understanding of PPFi as an innovation policy instrument when applied in different conditions.

This paper looks at Latvia as a subject of a case study, which being one of the weakest EU Member States in terms of innovation performance (EC, 2013), represents a critical case good for analysis of the nature of constraints for design and implementation of innovation policy and development of the national innovation system (NIS). Therefore, the analysis can provide useful insights for countries facing similar conditions. It should be noted, however, that apart from the effects of smallness, economic transition from socialist to market economy and policies implemented throughout the transition period can have additional impact on design and implementation of PPFi, thus complicating the constraints induced by the size of the state.

2. - Small States: Smaller Size, but not Problems

The size of the state as an explanatory variable has not attracted much attention in the mainstream economic theory. Nevertheless, there are limitations that small economies face in terms of availability of material and human resources, thus narrowing down the range of policy choices and limiting the ability to develop strong organisational and institutional capabilities. The combination of factors makes small states more politically and economically vulnerable, if compared to larger states. As a number of authors argued, a highly capable state is necessary for successful development of innovative capabilities, and thus of innovative and productive economy, particularly so in the conditions of increasing globalisation of economic activities (see e.g. Evans, 1995; Wade, 1990; Amsden, 1992; Reinert, 1999). This section provides an overview of different state size-related effects on economic development, innovation policy and public administration capacity.

Innovation, as the literature suggests, originates from the times of late *Renaissance*, when in 16th and 17th centuries, city-states of Venice, Florence, Delft and others were very successful in combining knowledge and putting it into practice,

making it possible to outcompete, in terms of economic and military capacity, much larger and resource-abundant states (Hall, 1999; Reinert, 2007; in Kattel *et al.*, 2010). In the 1960s, Kuznets (1960), however, suggested that size can have an adverse effect on economic development of the state. Since then some authors tried to vindicate the hypotheses proposed by Kuznets (see e.g. Easterly and Kraay, 2000; Laurent, 2008). However, the view that seems to dominate the discourse on small states and development suggests that smallness does impose numerous limitations on innovation and economic development. Main constraints induced by smallness are summarized in the following table:

TABLE 1

SMALLNESS-INDUCED CONSTRAINTS

Small size of domestic market	Does not allow attaining the critical mass of domestic demand necessary in order to reach a minimum efficient size of the production facility. It also exposes domestic market to adverse effects of monopoly or oligopoly.
Limited domestic resource base	Makes a small state vulnerable due to price volatility on commodities' markets. However, even if natural resources are abundant, there might be a limited variety of those. Also capital necessary to finance extraction of resources might not be available domestically.
Concentration of domestic output and exports	Due to limited supply of labour and lack of economies of scale, leads to overall dependence on a limited number of economic activities; this exposes the economy to exogenous shocks caused by demand and price volatility.
The high degree of openness to trade	Caused by limited possibilities of sourcing necessary goods and services domestically will lead to significant asymmetry in the patterns of domestic production and consumption (Kuznets, 1960; in. Armstrong and Read, 2003).
Scarcity of human resources	While forcing small states to engage in capital intensive activities (which may be beneficial under certain conditions), requires investment in education, training and skill acquisition. Limited financial capabilities together with limited human resources will limit the possibility to invest in science, research and development, hence targeting and favouring specific industries and technologies will be necessary precondition for successful policy measures.
Administrative capacity constraints	Limit the ability of small and, particularly so, small developing states to target specific industries effectively.

Source: Author's compilation on the basis of ARMSTRONG - READ, 2003; KATTEL R. *et al.*, 2010; THORHALLSSON B. - WIVEL A., 2006.

The limited pool of human resources directly affects administrative capacity and poses a challenge for creation of effective administrative systems necessary for development and implementation of policy measures, including innovation policy. There are some specific aspects related to smallness which have significant influence on the development and operation of public administration in small countries. As Randma-Liiv (2002) argues, principles of traditional bureaucratic models are not suitable for building public administration in small countries, which require a much more flexible public administration, for a number of reasons (Table 2).

TABLE 2

LIST OF REASONS WHY TRADITIONAL BUREAUCRATIC MODELS ARE NOT SUITABLE FOR SMALL STATE PUBLIC ADMINISTRATION

The boundary between politics and administration is blurred, or in worst cases non-existent. Flow of professionals between politics and administration is considerable due to lack of highly qualified personnel. Some professionals perform multiple functions thus mixing politics with bureaucracy and other functions that they assume in their professional life (Bray, 1991 in Randma-Liiv, 2002). The prevalent pattern of interpersonal relationships is that of multiple overlapping roles played by the same individuals (see e.g. Benedict, 1966);

In traditional bureaucracies appointments to civil service are made on the basis of merit and are impartial. In tightly-knit societies of small states, where relationship networks can span different spheres, it is difficult to control for impartiality, while selection on the basis of merit is often difficult due to small pool of human resources;

Small labour markets push for more flexibility and multi-functionalism on the side of civil servants. While one person can specialize in one area, multi-functionalism requires knowledge in a range of fields, thus reducing the abilities of civil servants to go deep into one field. Flexibility also means prioritization, meaning that for a highly qualified professional her particular area of interest or specialisation will be prioritized over other functions, which might well be important for the organisation (Randma, 2001);

Shortage of qualified personnel often results in flexible job definitions, or drafting of job descriptions for a particular employee, which might make subsequent evaluation of performance difficult. For the same reason candidates not suitable are often appointed or promoted to a position just because the position was open;

Mismatches in terms of skills and qualifications between people and jobs can result in intensive churn, career development problems (which often is perceived as one of the important motivational factors of employment in the public sector), lower productivity, or lack of leadership in the organisation, thus leaving a void for potential political influence;

Short career ladder and fast advancements of highly-skilled employees makes it difficult to develop strong civil service, as it can lead to potential "brain drain". To avoid this organisations are forced to create special positions for high-level civil servants, sometimes without subordinates. As development of specialist skills requires significant time, it can be considered as waste of resources in small organisations;

Multi-functionalism is possible not only across public organisations, but also between public and private organisations, thus leading to a potential conflict of interests, as well as problems of accountability;

Problems of accountability, management and control can also arise when there is very limited amount of specialists able to evaluate performance of another specialist, therefore making it possible for underperforming individuals to get through.

Source: RANDMA-LIIV T. (2002).

The overview of factors related to the size of a country suggests that small countries do face peculiar constraints which require development of contextually appropriate administrative apparatuses capable of developing and implementing policies tailored to fit the context of a particular country. At the same time, innovation has captured the agendas of a number of more traditional fields, such as education, regulation, and procurement, which have other primary objectives (Nauwelaers and Wintjes, 2008). This process of “widening” (the scope of innovation policy expands into realms previously not considered) and “deepening” (introduction of new and more sophisticated policy instruments) of innovation policy (Borrás, 2009) has led to an increasingly complex innovation policy mix, that requires highly capable state actors able to ensure strategic action and coherence within and between different policy measures. Vertical and horizontal policy coordination becomes ever more important as the number of interrelated policy measures, different initiatives, actors involved, and objectives to pursue increases the risks of overlapping or contradictory policy measures, which can result in waste of scarce resources. The complexity of innovation policy mix combined with the constraints imposed by the size of the state make development of capacities and capabilities in the public sector a precondition for successful action.

3. - Case Study: Public Procurement for Innovation as an Innovation Policy Tool in Latvia

3.1. Method

Case study methodology is used for the empirical part of the paper. One of the strengths of the case study methodology, as argued by Denscombe (1998), is the possibility to use a combination of different sources. Yin (1994) suggests a range of six main data sources suitable for case study research: archival records, documents, interviews, direct observations, participant observations and physical artefacts. The first three are used presently. Data sources and interviewees were selected using purposive sampling (Jupp, 2006). In addition to desk research, semi-structured interviews with a number of civil servants, representing different areas and different levels of public administration, were conducted in order to provide information on the perspective of policy stakeholders, substantiate the claims made theoretically as well as through desk research, and, also hope to discover aspects previously not discussed. Altogether five semi-structured interviews were conducted with civil servants directly related either to public procurement

or innovation policy-making: head of the Procurement Monitoring Bureau; head of procurement department of the Riga Eastern Clinical University Hospital; State Secretary for the Ministry of Economics; head of Innovation Unit at the Ministry of Economics; and head of Department of Electronic Procurement System at the State Agency for Regional Development.

3.2. *Introduction*

Latvia is a relatively small Eastern European economy, with a population of 2.04 million (Eurostat, 2012), and also comparatively small in terms of its geographical size. Besides the size-related constraints, Latvia is also a new EU member state with accession and compliance obligations, and formerly a transitional economy with comparatively weak economic and innovation performance¹. Latvia, as a small state, also has a comparatively weak bargaining position in the EU and other multi-lateral institutions (see e.g. Thorhallsson, 2006; Thorhallsson and Wivel, 2006). Thus, according to the definition of a small state provided earlier, Latvia can be considered as being a weak part in the asymmetric relationship and therefore, a small state.

Since August 1991, when Latvia together with the neighbouring countries Estonia and Lithuania re-established its independence from the Soviet Union, it has gone through two decades of constant change and reforms in all spheres, including numerous reforms with direct impact on the economy: reform of the pension system (Vanovska, 2006), reform of the civil service² (Hesse, 1993; Nunberg, 2000), as well as local government reform. Most of the economic reforms undertaken across *post*-socialist Eastern European countries (including Latvia) were focused on macroeconomic stabilisation and privatization. The implicit assumption was that as soon as the economy was stabilised and the ownership system restructured, the industrial restructuring and economic development would be ensured by the mechanisms of open market economy (Radošević, 1998, page 77). Therefore, no attempts of direct intervention of the state in technological and industrial restructuring were undertaken prior to the accession to the EU.

¹ In the latest Innovation Union Scoreboard for 2013, Latvia was placed among the four modest innovators, or countries with weakest innovation performance in the EU.

² TÖNNISSON K. and RANDMA-LIIV T. (2009) argued that during the transition period in the early 1990s for the CEE countries the question was not so much about reform or restructuring of public institutions, but more of building public sector from the ground up in the first place.

3.3. Development of National Innovation System in Latvia

A number of scholars have argued that inefficiencies and ineffectiveness of a NIS may be attributed to path-dependencies³ and lock-ins (Niosi, 2002), which to a certain degree can be understood by analysing the historical context. Thus, in this section an overview of the development of Latvian NIS is provided, including a brief overview of the early years of post-soviet restructuring, a time-line of the major decisions taken in relation to the NIS, as well as innovation policy development.

Beside the Soviet legacies, there were other processes that influenced innovation policy-making in Latvia since the very beginning. For the catching-up countries⁴ of the 1960s-80s, the main recipe for creating the capabilities for technological and economic development was the creation of Weberian-type of public administration, which made possible development of institutional memory, long-term policy planning, thus reducing information and transaction costs for the private sector. This way of governing the state⁵ allowed for active interaction between private and public sector, development of learning mechanisms, and therefore more contextually-relevant policy-making (Karo, 2011). Late catching-up countries of the CEE began developing innovation policies in a context dominated by the neo-liberal agenda of the Washington Consensus (WC) policies, as well as influenced by the processes of increasing globalisation and spread of information and communication technologies, constraining the policy spaces and making policy choices much more difficult, complex and increasingly dependent not only on domestic but also external socio-economic circumstances (Karo and Kattel, 2010; Karo, 2011; Evans, 2008; Perez, 2002). Beside the de-contextualized approach to innovation policy, based on a linear approach to innovation and exaggerating the importance of basic science, WC-influenced thinking pushed for downsizing of bureaucratic apparatuses and outsourcing significant parts of competencies, thus reducing the administrative capabilities of states (Manning, 2001; Drechsler, 2004). Therefore, from the very early stage of innovation policy development Latvia and other candidate states were put in unfavourable conditions, limiting the opportunities for fast catching-up.

³ «Most generally, path dependence means that where we go next depends not only on where we are now, but also upon where we have been» (LIEBOWITZ S.J. - MARGOLIS S.E., 2000, page 981).

⁴ Catching-up countries – countries lagging behind the technological frontier (ABRAMOVITZ M., 1986).

⁵ These ideas about governing the state were the result of analysis of economic development in East- and South-East Asian catching-up countries, such as South-Korea, Taiwan, Singapore (EVANS P. - RAUCH J.E., 1999; WADE R., 1990; EVANS P., 1995; AMSDEN A.H., 1992).

Since the mid-1990s numerous attempts were made to develop and implement an industrial development programme in Latvia, with an emphasis on re-industrialisation. However, due to volatile political situation, with numerous changes in the government⁶, as well as generally unstable government coalition, the industrial development programme had to undergo several amendments, before the Industrial Development Guidelines of Latvia were finally adopted by the government in 2001. The document recognized the limitations for Latvia as a small country in terms of variety of industrial sectors (information technologies; biotechnologies, wood chemistry; specific chemical and pharmaceutical sectors; and sub-sectors of material technologies) that could be supported and suggested that targeted support should be provided to sectors with higher value added. The Guidelines also emphasized the necessity of development of high-technology industries with high demand for skilled labour. Selection of the sectors was based on evaluation of the capabilities already developed in these sectors, as well as taking into account the research priorities already in place. These same sectors were on the agenda of policy makers in developed countries. While the selected target sectors were mostly comprised by high-tech knowledge-intensive sectors, the dominant share of business enterprises were operating in sectors with low knowledge and innovation intensity.

In the early stages of development of Latvian NIS a number of white papers were delivered to the Cabinet of Ministers, as well as numerous development plans, strategic documents and national programmes were developed and, to a certain degree, implemented⁷. The list of policy measures was entirely comprised of supply-side policy instruments, ranging from financial support to SMEs, grants to market-oriented research, financial guarantees for high-tech SMEs, development of quality assurance infrastructure, information infrastructure, as well as creation of business incubators and enterprises. However, it was emphasized that coordination of activities and policy measures targeting innovation were weak due to non-existent public body responsible for such activities. A working group responsible for innovation policy was comprised of the representatives of almost all ministries, on an *ad hoc* basis, without dedicated departments and, arguably,

⁶ In the period from 1996-2002 there were 6 shifts in the Government. Since the re-independence in 1991 there were 16 different Governments.

⁷ Most related to the development of NIS were National Programmes on: quality assurance, development of energy sector, foreign trade, 'informatics', as well as on regional development (KRISTAPSONS J. *et al.*, 2003).

without deep involvement in solving innovation policy related issues (Kristapsons *et al.*, 2003). This not only reduced the efficiency and effectiveness of innovation policy development and implementation cycles, but also limited the opportunities for active learning among public servants involved, accumulation of expertise, and development of specific capabilities necessary for successful deployment of innovation policies.

Linear thinking about innovation process, that dominated innovation policy-making from early on, put strong emphasis on science-industry interaction. Even though the Inno-Policy Trend Chart and Erawatch reports recognised that the overall level of absorptive capacity of business enterprises was comparatively low, and that most of innovative companies produced innovations through collaboration with their partners and customers (see e.g. Kristapsons *et al.*, 2007; Adamson-Fiskovica *et al.*, 2009), thus suggesting strengthening the demand-side of the policy mix. Innovation policy thinking, however, influenced to a large extent by very few representatives of the scientific community and high-tech sector, pushed for strengthening the university-industry interaction. This resulted in more supply-side measures, such as development of science and technology parks, funding for collaborative research projects, as well as additional funding for education, focused on supporting a very narrow range of enterprises, thus neglecting the potential for innovation in low and mid-tech sector.

The direction of development of innovation policy in Latvia, as well as principles upon which this IP was being developed, to a large extent depended on the guidelines provided by the EU, as well as on the EU funding since the very early phase as Latvia embarked on development of IP in pre-accession period to the EU. This limited the opportunities for experimentation with policy measures, as there was a general trend towards harmonisation of legislation. This can be seen in the objectives of the innovation policy on the early stage, where a range of broad measures targeting improvement of business environment clearly dominate (Table 3):

TABLE 3

PRIORITIES OF INNOVATION POLICY IN LATVIA 2000-2003

		2000	2001	2002	2003
I	Fostering an innovation culture	19	15	15	14
1	Education and initial and further training	1	3	5	5
2	Mobility of students, research workers and teachers	3	4	3	2
3	Raising public awareness and involving those concerned	4	2	2	3
4	Innovation and management of enterprises	4	1	1	0
5	Public authorities	3	3	1	1
6	Promotion of clustering and co-operation for innovation	4	2	3	3
II	Establishing a framework conducive to innovation	2	16	17	14
1	Competition	0	1	2	1
2	Protection of intellectual and industrial property	1	3	4	2
3	Administrative simplification	0	4	3	2
4	Legal and regulatory environment	0	5	4	2
5	Financing of innovation	1	1	2	3
6	Taxation	0	2	2	4
III	Gearing research to innovation	19	9	8	12
1	Strategic vision of research and development	1	3	3	1
2	Strengthening research carried out by companies	0	0	1	4
3	Start-up of technology-based companies	6	2	1	3
4	Intensified co-operation between research, universities and companies	4	2	2	1
5	Strengthening the ability of SMEs to absorb technologies and know-how	8	2	1	3
	Total Points	40	40	40	40

Source: Author's compilation on the basis of European Trend Chart of Innovation country reports.

By 2004, with the establishment of dedicated governance structures, such as the Innovation division and Steering Council of the National Programme on Innovation, some progress has been achieved in terms of efficiency in policy co-ordination, as well as in dealing with fragmentation of innovation policy across numerous departments and ministries. Policy development process has also become more open, involving different actors from both public and private sectors in discussions regarding development and implementation of innovation policy measures (Kristapsons and Adamsone-Fiskovica, 2005). In 2004, government decided on gradual increase of R&D funding from the state side by 0.15 per cent every year until the target of 1 per cent is reached by 2010 (Kristapsons and Adamsone-Fiskovica, 2005). Up to this day this, however, has not been achieved. Poor performance in terms of implementation of innovation policy as well as

R&D funding can be attributed to changes in the government, recent financial and ensuing fiscal crises, as well as lack of policy learning identified in INNO-Policy Trend Charts.

Since joining the EU in 2004 and with absorption of the EU structural funds, state funding for R&D has increased, however, other challenges, such as increasing business expenditure on R&D, increasing number of science and engineering graduates, and effective exploitation of existing research results, have remained unresolved. R&D expenditure on the business side of the economy is mainly constituted by a few large actors in the fields of pharmaceuticals and ICT, predominantly with foreign capital shares. The rest of business economy by the year 2006 was considered non-innovative, with very low levels of R&D expenditure. When proposing solutions on how to increase business expenditure on R&D (BERD), a few supply-side measures were suggested, such as revision of tax policy with respect to companies involved in national research programmes and projects, as well as risk sharing schemes between public and private sector. Demand side measures were not considered. In order to increase effectiveness of exploitation of public R&D research results, requirement for industrial partnerships was proposed as a solution, in order to increase collaboration between public research organisations and businesses, putting emphasis on market-oriented research. This proposition, however, neglected the suggestions of previous studies, which clearly indicated lack of absorptive capacity among the majority of enterprises, as well as their dominant mode of innovation – user(customer)-driven innovation. Interviewees also supported the view that innovative capabilities of domestic enterprises are often weak, with one of the interviewees, a policy-maker, stating that “the general level of technological and innovative capacities of Latvian enterprises is still at the level where we adopt, absorb innovations produced elsewhere.”

The new planning period of the EU Structural Funds for 2007-2013 complemented the existing innovation policy mix with additional measures aimed at addressing identified shortcomings in the NIS⁸, including such measures as: development of SMEs in specially supported territories; liaison offices for technology transfer; attraction of highly qualified work force; employee training; support for development of new products and technologies; enhancing export potential; competence centres; and business incubators (Kristapsons *et al.*, 2007). At this stage, similarly to what had been experienced before, innovation policy-making

⁸ Lack of innovative capabilities of the enterprise sector; lack of qualified science and engineering work force; weak innovative performance of the regions (KRISTAPSONS J. *et al.*, 2007).

was dependent on the guidelines regulating appropriation of EU SF, thus making a more strategic and long-term oriented approach difficult, limiting the time span of a particular policy measure to a time span of the particular EU SF planning period, which can undermine continuity in policy making process.

In 2008, with the recognition of substantial imbalances in the economy, deceleration of the growth rate and still growing inflation, an Action Plan for Stabilisation of Macroeconomic situation for 2008-2009 was devised, where one of the main points of emphasis was promotion of innovative start-ups, once again emphasizing lack of entrepreneurial activity and innovation in SMEs. By doing this, the emphasis was maintained on supply-side measures, such as tax incentives for start-ups, provision of seed funds, grants and state-supported loans, education and awareness-raising and the like.

The financial crisis had a severe impact on Latvian economy in general, resulting in negative GDP growth for three consecutive years (with decrease of 17.7% in 2009), a persistently high unemployment rate, reduction of public funding for R&D and innovation (by 40 per cent), as well as reduction of public budgetary expenditure in general, in order to satisfy the demands of the international credit institutions that provided financial assistance. The experts involved in development of measures to support Latvian economy suggested that involving more people in entrepreneurial activities would be one of the alternative solutions to resolve the unemployment issue. The proposal introduced by the Ministry of Economics (MoE) for mid-term recovery plan, however, showed the aspirations of the MoE to engage in more strategic and active policy-making. It highlighted that despite all the policy-measures devised and implemented thus far, predominant share of Latvian enterprises still operate in sectors with low value added, and emphasized that market mechanisms do not guarantee a shift of entrepreneurs towards more productive and profitable activities; but quite the opposite, it could lock-in in low value added, low productivity and less remunerative activities. Therefore the MoE suggested a more active response to the possibility of a low-productivity trap, by targeting specific sectors with high potential of productivity growth and general development. The following sectors were provisionally indicated as priority targets for policy measures: food industry, wood-processing, chemical industry, electric and optical machinery and metal processing. None of the indicated sectors belong to the so-called high-tech, but to the productive mid-tech, thus indicating a significant shift in thinking among policy-makers related to innovation policy. However, this proposal has been attacked from side of the business community, with one of the main opponents

being the Latvian Chamber of Commerce and Industry that challenged the notion of the state setting the priorities for future development of industries.

Even though demand-side measures were actively debated among the policy-makers on the EU level, and some countries⁹ were already implementing demand-side innovation policy measures, in Latvia there was hardly anyone to bring demand-side measures on innovation policy agenda. The only two attempts to introduce demand-side innovation policy instruments are “green procurement” and national research programmes. Both policy measures have not as yet been evaluated, thus any substantive conclusions are difficult to make. However, in case of national research programmes, which are in essence similar to pre-commercial procurement, the major issue is limited involvement of private enterprises in these programmes, which officially are organised on a competitive basis, but are clearly dominated by public educational and research institutions. One of the latest stages in the innovation policy-making process in Latvia was the elaboration of the “Sustainable Development Strategy of Latvia until 2030” (also called *Latvija 2030*) (Laboratory for analytical research and strategies, 2008), which suggested the following as the main priority areas for public support: user-driven innovation, open innovation practice, innovative entrepreneurship, and mass innovation culture. The programme for procurement of innovations suggests that public bodies should on a yearly basis dedicate budgets for procurement of innovative products and services designed to satisfy their needs, thus public bodies could work as catalysers and facilitators of innovative entrepreneurship.

The current edition of the mid-term action plan (2014-2020) for implementation of the Latvia 2030 strategy (CCSC, 2012) suggests that public procurement of innovation in its explicit form was abandoned as a policy measure, and is discussed only in relation to green procurement in terms of increasing the share of local sourcing when procuring goods and services for public organisations. The interviewees largely confirm that public procurement has not been considered as a policy instrument, for example stating that «Public procurement as a policy instrument hasn’t been discussed. Not in a framework of improving public pro-

⁹ Most active in terms of implementation of demand-side policy measures, including PPFIs from the very beginning, were the Nordic countries, Netherlands and the UK (some of the Nordic countries as well as Netherlands and the UK were actively involved in three pilot Public Procurement Networks aiming at industrial innovations in protective textiles, sustainable construction and health care. See http://ec.europa.eu/enterprise/policies/innovation/policy/public-procurement/pp-networks_en.htm). While in other countries policy documents were discussed and developed.

curement system, not when discussing development of state-owned companies, not when discussing public expenditure structure. Maybe only in an intellectual discussion, somewhat conceptually...».

3.4. *Public Procurement System: Development and the Current State of Affairs*

Public procurement is an administrative task, with the primary objective being to procure goods and services which would satisfy the needs of the public organisation, while making sure that the resources are used with maximum efficiency. However, as Lember and Kalvet (forthcoming) argue, it is influenced not only by the current economic conditions, but also by a range of institutional factors. Some of the influence upon decisions made by the policy-makers, and other parties involved in implementation of policies, can be attributed to path dependencies, some to already developed organisational routines and organisational memory in general, therefore suggesting a more critical approach to rational behaviour.

Since the early 1990s, when Latvia stepped on the reform path and a range of complementary reforms in political, economic and social spheres were initiated, policy-makers heavily relied on neo-liberal *laissez faire* ideology. Apart from the legislation adopted to regulate public procurement combined with adherence to the principles of a free market economy, as well as persistently comparatively low government budget revenue, have influenced the way public procurement system operated throughout the last two decades, since it originally was devised. Similarly to the situation in Estonia (Lember and Kalvet, forthcoming), active policy-making of an interventionist-type, mostly originating from the EU, as conditionality supplementing EU structural funds and other kinds of support. Active policy-making from within would require strong collaboration between actors from all three sectors – public, private and non-governmental organisations (NGOs). More importantly, effective interventions would require strong engagement of social partners (*i.e.* trade unions, employer/business associations, NGOs). As Kalnins (2004) suggests, becoming a member of the European Union had had a complex effect on democratic processes in Latvia, on the one hand strengthening the general democratic culture, whereas on the other hand exacerbating already existing imbalances in power between resource-rich and resource-poor lobbying groups. Thus making those in possession of resources, both financial and social (in terms of tight networks, personal relationships), more influential in the process of public policy-making. All these factors combined influenced the development

of policy-making in general, and development of public procurement system in particular.

The current public procurement system in Latvia is not a product of a long-term gradual development through constant adjustment, but a product of rapid development and perpetual change. As during the Soviet era, public procurement system was not necessary (*i.e.* due to an integrated planned economy), similarly to the rest of the *post*-Soviet countries (e.g. Estonia in Lember and Kalvet, forthcoming), after re-acquiring the independence a public procurement system had to be re-created from scratch.

The development of the public procurement system in Latvia can be roughly divided into 6 stages according to the legislative documents adopted as well as changes in the broader institutional context. The very first law on “Works and supplies for government needs” was accepted during the first period of Latvian independence in 1927. However, with the annexation of Latvia by the Soviet Union in 1940, planned economy was introduced, making procurement for the public sector as a separate system redundant. The period between 1991 until the adoption of the law on “Central and local government procurement” in 1996 can be described as chaotic, with no particular laws and regulations formalizing the process of public procurement, except for the regulation on “Works and supplies for government needs” which represented a slightly modified version of the regulation adopted in 1927, outlining public procurement regulation in very general terms.

The adoption of the law on “Central and local government procurement”¹⁰ in 1996 signified the beginning of the new stage in development of the procurement system, which coincided with the development of the UNCITRAL¹¹ Model Law on Public Procurement of Goods, Construction and Services, which was adopted in 1993/4, and later served for a number of countries in the developing world as well as transitional countries in CEE as a template to follow when reforming the regulatory systems of public procurement (Arrowsmith, 2004). The basic rationales upon which the adopted law was devised were as follows: ensure efficient use of public moneys; ensure the broadest possible participation of suppliers and contractors in public procurement; ensure free and fair competition among suppliers and contractors; ensure transparency, publicity and accountability, in order to improve the perception of the society regarding public procurement contracts. While it is difficult to argue against the positive aspects of the

¹⁰ Accessible here (in Latvian): <http://www.likumi.lv/doc.php?id=41265>.

¹¹ United Nations Commission on International Trade Law.

introduced law, such as the desire to ensure accountability and transparency, or efficient use of resources, the new procurement law restricted the space for public procurement to be used as a policy instrument. The trend towards free market and purely competitive tendering, based on price, was strengthened by generally neo-liberal approach to economic policy-making.

The EU pre-accession period marked another stage in the development of public procurement system. Accession to the EU required institutional convergence with the rules existing in the EU, thus the law on “Procurement for the needs of the state and local government” was adopted, following a set-up of institutions in accordance with the requirements of the EU. During these pre-accession years harmonisation with the EU regulations on public procurement led to direct transposition of the ideas of the EU single market and WTO GPA¹², leading to effective opening-up of procurement markets to competition from abroad. As Lember and Kalvet suggest in their analysis of Estonian procurement legislation reform (Lember and Kalvet, forthcoming), the early 2000s were the years in which the innovation policy was in its gestation phase and at the same time public procurement was regaining its strength as an innovation policy instrument. Nevertheless, public procurement of innovation was not introduced to the innovation policy agenda. The situation in Latvia in that sense was similar, public procurement was not recognized as an innovation policy instrument and focus of procurement regulation was maintained on ensuring transparency, and efficiency of public expenditure. This, in turn, resulted in adverse effects on procurement culture, developing an understanding of procurement as an exercise in efficiency and lowest price competition. As argued by a respondent, «the problem [currently] is not in the legislation. Directives and national regulations allow using different procedures and mechanisms which would allow procurement of innovation. There might be problem with financing... But the main problem is in culture. I really don't know how would you explain and prove to the Ministry of Finance, because you will need a really long time span to prove the economic effectiveness and economic value of a product or a solution which initially is more expensive, but then allows you to save on maintenance, etc. There you have to change the mode of thinking».

The final stage in the reform of public procurement legislation was the adoption of the “Public procurement law” in 2006/7 which signified the end of the transformation period and brought Latvian public procurement system into full

¹² World Trade Organisation Agreement on Government Procurement.

compliance with EU public procurement legislation. Legislation on public procurement was devised in a manner suggested by the EU procurement directives 2004/18/EC¹³ and 2004/17/EC¹⁴, thus creating separate regulation for the so-called “classical” sector (*i.e.* institutions of central and local government, as well as related institutions), and public utilities sector. At the same time, in line with the European Commission (EC) directives, new procurement procedures were introduced (*i.e.* competitive dialogue, as well as the possibility to use functional and performance specifications) that allowed more flexibility for the procuring side to devise the contract award criteria in a way that allowed innovation. The newly introduced procurement procedures, however, had no effect on the way procurement was organized.

Thus, it can be concluded that the development of public procurement system in Latvia was almost entirely influenced by external expertise or external conditions, such as harmonisation with EU legislation prior to the accession to the EU, emphasizing the aspects of openness, transparency and non-discrimination, therefore significantly restricting the scope for application of public procurement as a policy instrument. One could, however, only speculate on whether less restrictive rules would stimulate more active and “creative” use of public procurement to achieve specific socially or economically desirable outcomes.

The current procurement system can be characterized as a centralized procurement model, where two central bodies exist: the Ministry of Finance is responsible for public procurement policy in general, as well as for control of public expenditure, while Procurement Monitoring Bureau (PMB) is the body responsible for oversight of procurement procedures from initiation to the award of the contract. PMB is also responsible for training of procurement professionals, maintaining statistics on public procurement and other administrative tasks.

Some public procurement contracts are co-ordinated by a central procurement body – Electronic Procurement System, operating under the State Agency for Regional Development, which itself is a part of the Ministry for Environmental Protection and Regional Development. The Electronic Procurement System manages a significant share of procurement contracts in information and communication technologies, office equipment and furniture, pharmaceuticals and medical care products, as well as food and beverages. It functions on the basis of framework agreements with suppliers.

¹³ Procurement contracts for public works, supplies and services.

¹⁴ Procurement in the utilities sector (water, energy, transport and postal services).

The rest of public procurement decision-making is decentralised, which results in potential lack of expertise when organising complex procurement procedures in small municipalities (or other public entities with limited expertise), unexploited economies of scale where those are possible, as well as ineffective supervision (Lember and Kalvet, forthcoming). Lack of expertise and capabilities among procurement professionals was emphasised by all respondents, arguing that “the problem is not legislation... the problem is lack of expertise, lack of knowledge and lack of will to buy not just the cheapest, easiest and fastest, but also try to engage in more complex procedures, to write more comprehensive contract specifications, which would more precisely define quality and other parameters of the product or service.” Suggesting that there is a strong need for additional training for procurement professionals.

In order to strengthen control over public expenditure and effectively impose principles of fairness, transparency and non-discrimination, national thresholds introduced, which have to be abode by below the EU thresholds. National thresholds above which the use of regulated procurement procedures is mandatory are: ca. EUR 28,500 for supplies and services, and ca. EUR 170,700 for public works¹⁵. For purchases of supplies and services in a range ca. EUR 4,200 - 28,500, and contracts for public works in a range ca. EUR 14,200 - 170,700, a special procurement procedure applies, which nevertheless requires publication of public procurement notices on the website of PMB, and open competitive tendering. These national thresholds put additional pressure on public procurement professionals in terms of drafting contract documentation, as well as evaluating numerous tenders and complaints. Recent guidelines on prevention of corruption risks in procurement exempted from mandatory use of procurement procedures as defined by the Public procurement law, published by the Corruption Prevention and Combating Bureau¹⁶, suggest that there are still frequent occasions of corruption and abuse of exemptions granted by law for certain types of procurement. The risks related to the abnormally low prices were also brought up by the interviewees, the justification for which is often difficult to challenge, as no unified criteria for evaluating abnormally low-priced tenders exist, and the position of procurement professionals against suppliers is often viewed by public procurers themselves as weak.

¹⁵ Public procurement law, Article 8, Section 2: <http://www.likumi.lv/doc.php?id=133536> (in Latvian).

¹⁶ www.knab.gov.lv/uploads/free/knab_vadlinijas_korupcijas_riski_iepirkumu_iznemumos.pdf

Public procurement is one of the least professionalized areas of public administration. The main criteria for employment as a procurement professional often is a legal degree, as well as experience in the public sector. Often, particularly in small local governments and small public organizations with limited staff and budgets, functions of public procurement professional are performed on an *ad hoc* basis by an employee responsible for legal or financial issues. Public procurement professionals are not defined as a separate group of civil servants, and no particular certification system exists for public procurement professionals in Latvia.¹⁷ As emphasised by one of the interviewees, “procurement often is not even the second-rate responsibility of a civil servant, particularly in small municipalities and organisations, where organising procurement procedures can be assigned even to an accountant. We do not have a proper definition of who is a “public procurement professional” even.”

One of the important aspects influencing professionalization of public procurement is availability of training in procurement. In Latvia no formal university training in procurement is available. However, Latvian School of Public Administration provides training for civil servants on following issues: basics of public procurement law; drafting public procurement documents; latest issues in the regulation of procurement in public supplies/works/services; choice of procurement procedure and drafting relevant documentation; issues and guidelines in implementation of public procurement law; possibilities to optimize and modernize public procurement according to public procurement law; latest issues in the utilities’ procurement regulation; drafting documentation for “small procurements”; covering the current praxis in PMB. As course subjects suggest, the focus of training in procurement is solely on legal issues, not covering any technical aspects in relation to specific complex procedures, such as competitive dialogue or application of functional or performance specifications. PMB also provides training in procurement, with main focus on the latest changes in public procurement legislation, dealing with under-priced tenders and complaints¹⁸, as well as peculiarities of procurement of information and communication technology-related products, and aspects of procurement procedures for projects funded from EU funds. Focus on legal aspects of public procurement, not covering the strategic and management side of it, limits the possibilities of procurement professionals

¹⁷ On the basis of author’s analysis of procurement notices published by public procurement bodies.

¹⁸ From the interview with the Head of the Procurement Monitoring Bureau.

to procure innovative goods or services using more complex procurement procedures. Since the adoption of the latest public procurement law in 2007, competitive dialogue procedure has not been used, suggesting that there are limitations in capacity and capabilities of public procurement professionals. One of the interviewees, on the question why, for example, competitive dialogue is not used explicitly stated that “the simple answer is lack of experience. You have to be first of all an equal partner in this dialogue for it to be successful. You have to be competent. We have a very decentralised procurement system, where there are a lot of organisations or municipalities that do not have the necessary expertise to organise any complex procurement.” Beside the general focus on legal aspects of public procurement, the opportunities for introduction of more complex concepts and procurement procedures into training are constrained by fast turnover of employees in the public sector. As emphasised by interviewees, every time they have training on procurement, they are forced to cover the very basics, as there are numerous people in the audience, which require the very basics of the legal aspects of public procurement.

Another important aspect characterising public procurement system in Latvia is overreliance on open competitive procedure as a main contracting procedure. As statistical data provided by the PMB suggests, not only in case of contracts below EU thresholds, but also above EU thresholds, in the period 2004-2010 open competitive procedure was used in 85 to 95 per cent of occasions. The second most common procedure is negotiated procedure often used for more complex works and services contracts. In case of negotiated procedure the value of average contract is significantly higher than that of the average contract value under open competitive procedure. Competitive dialogue has not been used since the procedure was included in the public procurement law in 2007. As suggested by one of the interviewees: “There is a kind of general understanding, particularly in the most recent years, when government budget in Latvia is under constraint, that you must accept the lowest bid, and the lowest price as the main evaluation criteria. Yes, public budget is the main constraint. We have to buy the cheapest.”

In terms of procurement indicators as well as the structure of the procurement system, Latvia appears a normal EU country. According to the most recent data, public sector expenditure on works, suppliers and services in Latvia constituted 20 per cent of the GDP (EUR 3.6 billion)¹⁹, which is slightly above the EU av-

¹⁹ EU public procurement indicators http://ec.europa.eu/internal_market/publicprocurement/docs/indicators_2010_en.pdf

erage, but is also a result of the decline in the GDP since the financial crisis of 2007/2008. However, in terms of openness of public procurement markets (if evaluated by the percentage of tenders published in the Official Journal), Latvia is a clear outlier not only on the general EU level, but also among the small EU member-states (Table 4).

TABLE 4

OPENNESS OF PUBLIC PROCUREMENT MARKET BASED ON THE SHARE OF
PUBLIC PROCUREMENTS ADVERTISED ON TED

	2007	2008	2009	2010
Latvia	63	61.1	42.1	57.3
Small EU member states	27.04	24.11	33.13	30.98
Total EU 27	16.9	17.4	18	18.6

Source: EU PP indicators, 2010: http://ec.europa.eu/internal_market/publicprocurement/docs/indicators2010_en.pdf.

Note: Small EU member states include countries with population below 6 million: Cyprus, Denmark, Estonia, Finland, Ireland, Lithuania, Luxembourg, Malta, Slovakia, Slovenia.

Regarding the distribution of public procurement expenditure across sectors, it is dominated by construction works, financial services and insurance, transport equipment, fuel and energy and medical equipment, and business services (including architectural and construction services) which altogether constitute 60 per cent of total public purchases on average over the period 2005-2011 (Table 5), and 7.23 per cent of GDP. This, in turn, suggests that strategic procurement of innovative goods or services in a limited range of sectors.

TABLE 5

MAIN PUBLIC PROCUREMENT CATEGORIES IN LATVIA ACCORDING TO CPV,
ON AVERAGE OVER THE PERIOD 2005-2011

CPV divisions	2005-2011 average (EUR million)	2005-2011 average (% of registered public procurements)	2005-2011 average (% of GDP)
Construction works	1138.16	36.0%	4.33%
Financial and insurance services, including 67000000-7 for 2005-2008	276.79	8.8%	1.05%
Transport equipment and auxiliary products to transportation	157.23	5.0%	0.60%
Petroleum products, fuel, electricity and other sources of energy	119.75	3.8%	0.46%
Medical equipment, pharmaceuticals and personal care products, including laboratory, optical and precision equipment (38000000-5) for 2008-2000	111.48	3.5%	0.42%
architectural, construction, legal, accounting and business services: combined 71000000-8, 79000000-4 & 78000000-7 for 2005-2008	96.61	3.1%	0.37%
agricultural, forestry, horticultural, aquacultural and apicultural services	88.32	2.8%	0.34%
Office and computing machinery, equipment and supplies, including software and information systems (48000000-8)	53.31	1.7%	0.20%
Transport services (excl. Waste transport), including 61000000-5 and 62000000-2 for 2005-2008	56.45	1.8%	0.21%

Source: Latvian procurement monitoring bureau, <https://www.iub.gov.lv/node/52>.

4. - Discussion

The Latvia case study provided the necessary contextual information that helps understanding and differentiating the effects of smallness and those that arise due to the nature of pre-existing institutions, which influence the process of policy-making through such effects as path dependency as well as institutional inertia. PPFi is a policy instrument capable of addressing (at least to some extent) a number of innovation system failures by improving the level of awareness of policy-makers about the current conditions in which businesses operate, innovative and

technological capabilities of businesses, as well as their demands; providing a market for innovative solutions that can be signalling to the private sector about the feasibility of these innovative solutions. However, in order to apply PPFi in practice, a number of constraints need to be overcome. According to the theoretical discussion provided in the first section, limitations for successful design and implementation of PPFi can have different origins, ranging from the small size of domestic market to lack of necessary capabilities and capacities in the public sector.

Firstly, what is crucial for design and implementation of PPFi, is a strategic approach to policy making and coordination between different policy domains and, therefore, different ministries and agencies. The results of the case study, however, that these are the main deficiencies in the system. Lack of strategic approach to innovation policy-making, and in particular to PPFi, which is entirely neglected, was emphasised by policy-makers as an acute problem. Coordination between domains of different ministries and agencies, as the responsibilities for innovation policy distributed between Ministry of Economics, Ministry of Education and Science and Ministry of Environmental Protection and Regional Development, is another critical bottleneck that sometimes leads to conflicting objectives and negative outcomes, or general inefficiency in using scarce resources. Coordination issue becomes particularly important when it comes to PPFi, as it involves additional actors (e.g. procurement body, oversight authority, etc.), requiring additional coordination capacity. As a result of this complexity, more time and organisational resources are required to launch complex procurement contracts, as they have to be negotiated and approved in numerous instances (e.g. if competitive dialogue procedure is to be applied). Thus the whole process to a large extent depends on the availability or indeed development of capacities and capabilities in the civil service in order to make all the complex policy design, implementation and related coordination activities possible.

Besides coordination capacities, successful PPFi requires a “smart” customer on all stages of procurement process. First, a procurement entity should be capable of acknowledging and expressing the needs and requirements for the product or service to be procured. Secondly, it should be capable to draft the specification in a way conducive to innovation, on the one hand not constraining innovation by overly prescriptive specification, and on the other hand devising a specification that is precise enough for a developed solution to satisfy the needs. And lastly, but not less important, procurement professionals should be capable of evaluating the functional performance of a proposed or delivered product or service. All this combined requires a set of skills and capabilities ranging from purely adminis-

trative skills, such as project management, technical skills when the procured solution is highly technologically complex, as well as strategic management and planning skills.

Here the two limitations induced by the smallness of the state, but also somewhat magnified by the effects of transition are related to scarcity of human resources and the resulting constraints on administrative capacity of the public sector, become highly relevant. The case study suggests that development of capabilities is still an important issue, which is compounded by the lack of opportunities for career advancement intrinsic to small states; comparatively low pay for highly qualified professionals; and possibilities for labour mobility provided by the open European labour market; all stimulating brain drain. Lack of existing capabilities and the acute need for development of capabilities and capacities in the public sector was identified as the key constraint on the way to successful implementation of PPFi as a policy instrument, both theoretically and in the case study. These issues are also under-explored in the context of PPFi research.

For transitional economies of CEE, the context for development of public administration was radically different from that in the Western European countries with bureaucratic traditions lasting for decades if not centuries. The nature of the process was not of gradual change, but of radical transformation from dictatorship to democracy in political sphere, from centralisation to decentralisation in governance structures, from planned to market economy, and so forth (Goetz, 2001). Former elites had to be dealt with and former administrative apparatuses radically reformed, thus requiring not just adjustment in administrative culture and practices, but introduction and development of new public administration and management systems from the ground up. Institutional reforms were pushed rather swiftly, however, due to the domination of neo-liberal (economic) thinking and general distrust towards the state as a legacy of Soviet period, the understanding of the concept of the State was lacking. As Randma put it: "While quite successfully introducing market reforms, it has often been forgotten *that market economy does not function without a well-functioning state.*" (Randma, 1998, page 17; in Drechsler, 2003, page 12)

Formal implementation of reforms was not an issue, as drafting laws mostly on the basis of legal practice of Western democracies did not require much time. What made the actual implementation of reforms difficult was lack of well-qualified civil servants that were not part of the previous system and thus would not bring along embedded practices (Drechsler, 2003). Lack of qualified professionals was exacerbated by a number of other widely-recognized obstacles, including,

inter alia, communist legacies; general resource shortages, both financial and organisational; immediate economic, political and social issues overwhelming decision-makers, thus limiting their ability to prioritize the on-going reforms; conflicting and sometimes contextually inappropriate external advice; and inevitable time-lags between formal reform implementation and actual institutional transformation, which takes considerably more time (Goetz, 2001).

While usually bundled together all CEE economies, although certainly moving towards achieving similar objectives, have chosen different paths in reform of their public administration systems. The reform strategy adopted in Latvia was of a mixed type, introducing some elements of Weberian-type hierarchical administration and adding some NPM-type reforms on the later stages of public administration reform, primarily during the EU *pre-* and *post-*accession period (Nemec *et al.*, 2011). Building a classical Weberian-type civil service based on merit, legality, hierarchy and division of labour would however, even if desirable, be hardly attainable due to the smallness-related constraints. Here limited pool of qualified professionals becomes the central restraint, as the demands for the basic institutions in small states are similar to those of their larger counterparts, thus requiring a certain degree of multi-functionalism on the part of civil servants in sacrifice of division of labour and specialisation (Randma-Liiv, 2002).

Development of public administration in CEECs was marked by another peculiarity – even before appropriate administrative capacities were established and capabilities developed, discussions on “downsizing” the government were ignited across the CEECs, particularly in countries with the political sphere dominated by the liberal parties. To some extent it was also a reaction to weak economic performance, which significantly limited public expenditure (*ibid.*).

Similarly, as Grabbe (2001) argued, in case of CEECs transformational power of European integration on national administrative systems was much stronger than it was the case with Western European Countries. This, as Goetz (2001) suggests, can be explained by a number of reasons: delegitimized and weak pre-existing institutions; policy and institutional “voids” in public administration (PA) making integration of new policies and practices easier; substantial pressure and explicit attention of the EU to national administrative capacities, and particularly to the ability to administer the *acquis communautaire*; very short time periods in which CEECs were supposed to transform their institutions according to EU standards, as adjustments were required before the accession.

Beside all the positive effects of europeanisation of PA, such as training and experience exchange in PA, it also had a range of adverse effects on the development

of the administrative apparatus. Firstly, EU integration required adjustment of institutions that were still in the early development phase, thus disrupting previously started reforms and bringing additional pressure on civil servants, which even without new requirements struggled to deal with their day-to-day objectives. Secondly, negotiation of EU accession and subsequent implementation of the *acquis* in CEE promoted relatively small groups of politicians and officials on the career ladder, thus creating enclaves of officials distinguished by their professional competences (Lippert *et al.*, 2001). Consequently, institutions related to EU accession differed markedly from the rest of the public administration in both quality and efficiency; also their employees had higher status, better education and skills as well as higher remuneration (Nunberg, 2000). Thus, Nunberg (*ibid.*) suggests, the creation of enclaves of professionals dealing with EU accession-related issues could have been harmful for the PA in general. Due to limited availability of qualified personnel, “...EU talent has largely been siphoned off from core public administration tasks. Continuing demand for EU skills will further deplete professionals from the larger public administration.” (Nunberg, 2000, page 21)

Besides all the previously discussed problems, one of the central reasons for comparatively weak domestic administrative and policy capabilities and capacities, particularly in the domain of innovation policy, was that CEECs never actually developed policies, but throughout the *post*-Soviet period were policy takers. First from the international institutions²⁰ in the early 1990s; and later from the EU (Karo and Kattel, 2010*b*). The recent financial and ensuing economic and fiscal crises only exacerbated the issues already in place. The austerity measures imposed by the Latvian government between 2008 and 2012 concerned mostly operational expenditure of agencies and ministries, thus requiring cuts in the number employees in the public sector, as well as reduction in remuneration for the remaining staff up to 30 per cent.

PPFI thus entered innovation policy discourse in Latvia at a time when local capacities and capabilities might be insufficient for effective policy design and implementation. Beside already mentioned institutional issues, currently pressing problems that make development of capabilities difficult, made vocal by respondents, included: significant employee turnover in the public sector due to comparatively low pay; lack of human and financial resources for policy-relevant research; and central to performing PPFI, lack of professionals in performing pro-

²⁰ The World Bank, European Bank for Reconstruction and Development, the International Monetary Fund.

curement functions, as well as lack of general professionalization of procurement functions across the public sector and particularly in smaller organisations. The small country effects are related to the size of public procurement markets in absolute terms in combination with diversity of the needs of the public sector that is comparable to the diversity in larger countries, limited number of local suppliers, as well as the level of innovative capabilities of local suppliers. Diversity of public procurement does not allow attaining the necessary minimal scale sufficient to have any substantial effect on innovation among suppliers. Lack of local suppliers can potentially lead to cross border spillover effects of domestic policies, particularly considering the openness of public procurement markets in Latvia.

Some of the arguments against application of PPFi in context of Latvia, however, suggest a rather narrow perspective on PPFi as a policy instrument that persists among policy makers in Latvia. PPFi is perceived more in terms of pre-commercial procurement than in terms of a whole product life cycle, where innovations can be developed on different stages, thus allowing to improve performance characteristics of even the most standardized products²¹. Same arguments made by the respondents also suggest that PPFi is not perceived as a part of a comprehensive innovation policy mix that includes other demand- and supply-side measures. Considering diversity of public procurement, it still can be suggested that public sector can be a lever in a number of sectors, such as construction, financial and insurance services, as well as health care and information systems, where the public sector constitutes a significant share of domestic demand. In fact, the most important sector where public procurement is used as a policy instrument currently is construction, where some attempts were made to stimulate demand for new more sustainable solutions through “green procurement” (Kristapsons *et al.*, 2011). The results of these initiatives in terms of innovation in the construction industry, however, need to be studied in detail in order to make any specific conclusions. Apart from numerous examples of successful innovative procurement originating from comparatively small countries of Northern Europe, the case of information technology procurement in Estonia, while being not conscious policy to support innovation, still provides a good example

²¹ Here one of the good examples of innovative procurement of standardised goods could be procurement of environmentally sustainable furniture and other goods in the Netherlands, which are produced according to the principles of Cradle-to-Cradle, thus reducing the environmental impact of public procurement as well as providing the necessary scale for further development and distribution of Cradle-to-Cradle practices also to the private sector (see e.g. NL AGENCY, 2010).

of successful procurement of innovative solutions for the needs of public sector²² (For an overview see Kalvet, 2012; Lember and Kalvet, forthcoming).

Besides the constraints induced by smallness, a number of other constraints were identified. Firstly, as discussed earlier, procurement practices based on price competition were institutionalised in procurement organisations, creating a procurement “culture” dominated by open competitive tenders and auctions where price is if not the only, then always the main criteria for selection of a winning bid. This culture was grounded in the procurement legislation based at first on UNCITRAL and later on the earlier versions of EU procurement directives, where the main principles of openness, transparency and non-discrimination, coupled with price competition constituted the core. The culture of lowest price tendering was strengthened by persistently low procurement budgets, as well as low level of capabilities in the public sector. Over-reliance on open competitive tendering can also be partially explained by generally risk-averse behaviour of civil servants involved in public procurement. As expressed by an interviewee, due to general perception of public procurement as a good environment for potential corruption, it is often used to displace public officials that are unsuitable politically. This affects the choices of officials, who decide to rely on more transparent procedures in order to stay in office. One of the interviewees involved in public procurement at the operational level, suggested that open auctions, if allowed, would be a preferable procedure, allowing attaining the minimal possible price, thus suggesting persisting lack of understanding of possible positive long-term effects of innovative solutions on performance of an organisation in terms of effectiveness and efficiency. Lack of information regarding the possibilities to engage in procurement of innovative solutions was also mentioned by the respondents as an important retarding factor.

The high rate of employee turnover present in the public sector, emphasized by the respondents, is yet another factor limiting the opportunities to engage in PPPFI. This effectively makes it difficult to provide information about the most recent developments in the EU public procurement policy, because most of the effort, particularly under fiscal constraints, is dedicated to provision of training to newly recruited procurement professionals and other public sector employees entering the public procurement system. Thus education of public sector employees in public procurement matters, which should not be confined solely to procurement professionals, but involve broader spectrum of civil servants from

²² Especially in the implementation of e-government and e-governance.

different fields, as well as provision of information on the most recent trends in EU procurement policy remains a very important challenge for development of capabilities.

5. - Conclusions

This study explored the potential of public procurement for innovation as an innovation policy instrument in the context of a small country. In the recent years the EC has been putting more emphasis on the use of procurement budgets to stimulate innovation, suggesting that EU member states “should set aside dedicated budgets for pre-commercial procurements and public procurements of innovative products and services” (EC, 2010, page 17). However, under the conditions identified in this case study, use of public procurement as an innovation policy instrument can face certain barriers that can weaken or eliminate altogether the potential positive effects on innovation capabilities of suppliers. The results of the study confirm the conclusions suggested by Georghiou and colleagues (2010) in their study of public procurement in small European countries, particularly their proposition on centrality of development of administrative capacities and capabilities necessary for effective design and implementation of PPFi as a policy instrument. The study also suggests that some of the constraints identified theoretically and substantiated empirically are related not only to the size of the state but also to the effects of transition and policy context which has developed over the last two decades since re-independence. These limitations on PPFi as an innovation policy instrument are in line with the argument developed by Kattel and Lember (2010) on the issues that might arise when trying to apply PPFi as an industrial policy tool in the context of a developing country. Additionally to the issues mentioned earlier, the research emphasises the importance of path-dependency and organisational practices that develop throughout time also affects the thinking of policy makers when devising new policy mixes. The research suggested that there was general tendency among policy-makers to favour supply-side mechanisms as those are already tried out and do not require additional competencies, while at the same time the policy makers are reluctant to engage in designing and integrating in the policy mix new, previously unexplored policy measures. On the operational level of public procurement the same effects of path dependencies and institutionalised practices, such as preference for open and competitive procedures as well as price as the main criteria for evaluation of

tenders, were identified as factors that might potentially limit the possibilities for implementation of PPFi.

The case provides a range of implications for policy. First of all, prior to setting aside budgets for pre-commercial procurement and procurement of innovative goods and services, a thorough analysis of existing domestic capacities and capabilities, as well as analysis of the public procurement market needs to be undertaken, in order to identify the priority sectors where public procurement can have maximum potential effect. This suggestion goes in line with the recent research on smart specialisation. Secondly, domestic policy capacity and capabilities need to be strengthened, allowing for a more active approach to innovation policy-making. Furthermore, both vertical and horizontal coordination, as well as coordination among the set of measures constituting the innovation policy mix is necessary in order to maximize the effects of innovation policy. Lastly, but not least important, the expertise of public procurement professionals needs to be developed and maintained on a high level; and public procurement culture needs to be adjusted to the needs of PPFi, allowing for more risk taking and encouraging more innovative solutions.

Nonetheless, there are limitations to this study. The results of this qualitative single-case study cannot be generalised easily to other small countries; however, the case still provides a perspective on the potential constraints. Furthermore, this case study provides only one perspective on PPFi as a policy instrument in a context of a small state, focusing first of all on a small transitional country, and also on different levels of civil service. The research can be taken further in a number of different directions. Firstly, a comparative study of a small transitional country (e.g. Latvia) and a small developed country (e.g. Finland) could potentially be helpful in distinguishing the effects of smallness and the effects of transition. Another direction to take is to study procurement practices on the organisational level, including small local municipalities and public utilities, as it could provide a more detailed account on procurement practices and perceptions of procurement professionals on procurement of innovative goods and services in a small country. Further research is necessary to provide a perspective on impact of public procurement on innovation in enterprises operating in small states, as well as general perception of businesses on the possibility of public-private cooperation in development of innovative goods or services through procurement.

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A Conjecture on Institutional Rationalities and Property Rights in Public Procurement of Innovation

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The increased interest in using public procurement as a policy tool for innovation has renewed a need for understanding the procurement process. A conjecture on institutional rationalities and property rights is offered to explain the hurdles present for conducting successful procurement projects. If an efficient negotiation solution is to be achieved, participants in procurement projects need to be aware of the other participants' institutional rationalities and actively consider these while concluding the terms of procurement projects. Consequently, future policy efforts towards increased innovation have to be targeting the process of public procurement of innovation, rather than focusing on regulatory issues.

[JEL Classification: D02; D23; O31].

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1. - Introduction¹

This paper sets out to explicate the role of public procurement of innovation (PPI) in a world characterised by an increasingly complex reality, manifested through requirements concerning sustainability, other social aspects, requirements to reduce expenditures, etc. The extended use of public procurement as an innovation policy tool will require revision of the understanding of the processes involved when formulating such policies, but also of the processes involved when public procurement of innovation is initialized and practiced.

Within the European Union public procurement of goods and services takes place on the scale of 2 trillion Euros every year, which corresponds to 19% of the Union GNP (European Commission, 2011*a*, page 4). According to current innovation policy thinking, this is a purchasing power that can be used to stimulate horizontal policies promoting *e.g.* sustainability or innovation from the demand-side. However, in order to understand public procurement of innovation, it is not sufficient to understand how often a purchase happens, but also why it happens.

On the European level, efforts have been made over the last decade to bring out existing possibilities to do public procurement of innovation (*e.g.* European Commission, 2008, 2011*b*). Academic literature has in different means dealt with the role of public procurement as a means to stimulate innovation. Edler and Georghiou (2007) emphasise the role of public procurement as a demand-side innovation policy instrument. By drawing on institutional theory, Rolfstam (2007, 2009) outlines an understanding for how it can be achieved. Uyarra and Flanagan (2010) downplay somewhat the expectations of using public procurement as a strategic innovation tool, and suggest instead the ambitions should be to promote innovation-friendly public procurement in general. This new policy focus has sparked debates essentially driven by a concern for a perceived underutilization of public procurement of innovation in practice. A re-occurring theme in this debate is the role of the EU Directives for public procurement. Our assertion here is that this debate is superfluous, in the sense it does not describe the full context of the situation for public authorities. Rather, there is a need for re-investigating how policy ambitions are translated into action by procuring au-

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thorities. One perspective to structure an analysis of authorities' actions is institutional analysis (Rolfstam, 2009, Rolfstam *et al.*, 2011*b*). Three modes for such research have been suggested elsewhere (Rolfstam, 2012*b*): "multilevel institutional analysis", "endogenous and exogenous institutions" and "institutions as rationalities". Focusing primarily on an investigation into institutional rationalities, such analysis makes distinct four different rationalities: political, legal, economic, and scientific rationalities (Van De Donk and Snellen, 1989, Gregersen, 1992). These rationalities are inherently connected to endogenous institutions within the specific organisation (Rolfstam, 2012*b*), and describes preferences towards different behaviours by the procuring authority and other stakeholders. In the case of public procurement, rationalities manifest as strategies that affect the processes of concluding public procurement contracts. Contracts manifest in this light institutional match between stakeholders.

In order for a public procurement endeavour to be successful, the relationship, *i.e.* the contract between the participants has to be set up in a manner which increases the probability for successful project to be carried out. In this paper we use a theory on property rights to investigate contracts (Hart, 1995, see Ågren and Landin, 2012 for an exemplification) in order to connect strategies and rationalities of the participants to the contract situation. A contract affects the end outcome, when the contract provisions distributes resources between the parties, in a mode which gives incentives to the participants for actions (Aghion and Tirole, 1994), *e.g.* transfer knowledge, transfer patent rights, vertical integration, delivery of goods. In other words the contract introduces preferences towards certain behaviour. However, these theories are predominantly focused on economic incentives towards behaviour. And while economic incentives may describe one dimension of incentives, we propose that institutional rationalities of all forms have to be considered when understanding preferences towards different behaviours during contract performance. Thus, non-economic rationalities also have to be taken into account while studying the process of concluding public procurement contracts. If so, a successful contract has to be organised with an approach which support institutional rationalities possessed by the participants in the specific context. This notion suggests that applicable institutional rationalities have to be matched between the participants, in order for a successful procurement contract to be conceived. In an effort to solve this puzzle we suggest that this matching can be described with an analogy to non-cooperative games (Nash, 1951), where the institutional rationalities take the role of strategies, and where the game itself is the creation of the public procurement contract. This proposi-

tion entails that in order for a contract to be successfully supportive of rationalities, the game has to be solved in a mode which is of benefit for all participating actors, *i.e.* reach equilibrium (Nash, 1950*b*). Hence, in order for an effort to procure to be successful in the negotiation (*i.e.* the conclusion of a procurement contract), it is necessary for participants pertinent institutional rationalities to be mutually supportive or non-competing.

From the starting point laid down above, we analyse nature of public procurement projects in order to establish how institutional rationalities interact and how they affect project outcome. By showing how the theoretical concepts, presented above, can be recognised in projects, we fill a gap in theory by establishing a plausible conjecture on how institutional rationalities and property rights are related. We suggest that if Pareto efficient Nash equilibrium points, given the existence of different institutional rationalities at the authority's and the tenderer's sides can be identified and coordinated (*i.e.* achieving an institutional match), this would ease the development of contracts enabling a successful project outcome. This perspective raises demand for increased rationality awareness among policymakers in general, but foremost contract negotiators that potentially could facilitate revision of current institutional set-ups towards a direction which is more supportive of innovation and sustainability. Issues to take into account in such rule making are, for instance, how funding is distributed, timing, specifications, project design, etc. In that way, policy initiatives promoting public procurement as a means to stimulate innovation can be made more efficient in achieving its goals. We will first discuss the characteristics of institutional rationalities, in the third section we will describe the theory of property rights and how those rights can affect organisational behaviour. In our fourth section we are providing the link between institutional rationalities and property rights, and in the final conclusion we will lay down the implications of this link for research into public procurement of innovation.

2. - Institutional Rationalities

The notion of "rationality" as it is used in this paper draws on an institutional view where human collaboration is seen as processes «governed, supported, affected and/ or regulated by institutions understood as at least effectually collectively agreed on *ex ante* structures» (Rolfstam, 2012*b*, page 306). For the EU, the central rules regulating public procurement are the EU Procurement Directives

as transposed into national law. Other rules for a specific procurement project are specified in the contract. The institutional analysis of public procurement can however be conducted in several different modes apart from the one emphasising formal law and written contracts. It should also consider that institutions prevail on different levels; can be exogenous and endogenous, and manifest as rationalities (Rolfstam, 2012*b*).

The notion of rationality is based on essentially an evolutionary assumption that organisations are entities that evolve with scarce resources through purposeful selection (Vanberg, 1997). They contain in that sense some kind of “procedure for determining the action to be taken” (Nelson and Winter, 1982, page 57), or, in the terminology used here, rationality which affect conditions for learning and the creation of organisation-specific routines (Nelson and Winter, 1982, Argyris, 1993). The rationality notion does therefore explain organisational variety. An organisation established to be responsible for any emergency calls related to fire will over time develop skills and attempt to secure further competences and resources relevant for this purpose. A commercial firm specialising in selling holiday trips will over time develop other skills relevant for that particular purpose. The assumption would thus be that an organisation chooses one act over another act purposefully in order to secure its own survival given its rationality.

Van de Donk and Snellen (1989) distinguish between four different rationalities that may influence the actions and decisions in public administrations. These are political rationality, legal rationality, economic rationality and scientific rationality. This framework can be useful to help analysing institutional mismatches, understood as differences in rationalities, as attempted by Gregersen (1992) and Rolfstam (2012*a*). Political rationality refers to actions made by the ruling group in order to remain in power, which typically leads to a biased focus on “the problems of the collectivity” (Van de Donk and Snellen, 1989, page 10). This implies that «government actions and decisions reflect the – at any time – dominating political and economic interest groups or coalitions» (Gregersen, 1992, page 132). Legal rationality refers to the ambition to comply with law and thus to the legal establishment. Public policy «must have its foundation in law, must honour the guarantee function of the law, and must ensure equality before the law and legal security» (Van de Donk and Snellen, 1989, page 10). Economic rationality refers to restrictions on public policy due to budgetary limitations. A public agency, for instance, is not supposed to waste taxpayers’ money. The importance of economic rationality, following Van de Donk and Snellen (*ibid.*, page 10), varies over time, as the economic conditions change. Scientific or, as sug-

gested by Gregersen (1992), «paradigmatic» rationality refers to institutional specificity in *e.g.* specialist public agencies, *i.e.* that «each sector in society recognizes its counterpart in a social-scientific discipline or technological discipline» (Van de Donk and Snellen, 1989, page 11).

With the acceptance of the rationality notion as developed above comes implications for inter-organisational collaboration. As any rationality determines both directions on where to strive and what to avoid also in collaboration, the rationality determines selection regarding any collaborations. For instance, a private firm may choose not to join a project if the commercial expectations are too low. A local council politician may avoid the initiation of costly projects near the next election. A decision to engage in collaboration does in that sense reflect a perception of match between the rationality of the organisation and the conditions offered in the collaboration. Previous studies have found that projects aiming at public procurement do not necessarily always fail due to regulation, or lack of knowledge, it may fail because different organisations are valuing rationalities differently (Rolfstam, 2012*a*). Rolfstam (2009, page 366) concluded in a case study regarding one failed effort of public procurement of innovation: «one might say that the failure of the procurers to find a supplier had more to do with the fact that each of the organisations involved did exactly what they were supposed to do». To use our previous terminology, in the case referred to by Rolfstam the actors in the project chose actions coherent with their configuration of institutional rationalities, and those rationalities did not match, thus the project failed. In conclusion, in order for public procurement of innovation to actually occur, there has to be an institutional match (Rolfstam, 2012*b*, 2009) between the actors' rationalities.

In order to investigate what the concept of institutional match further, it is necessary to understand the context in which these matches exist. Public procurement always entails the procurement of something; it may be services, goods or construction of buildings, for example. For public authorities within the European Union those activities are regulated in different forms, for example by the classical directive on public procurement (2004/18/EC) and through primary law within the Union. Those rules describe different procedures and privileges, in an effort to ensure that a public authority acts in accordance with the purpose of the Union. They do not, however, describe priorities or strategies a public authority should use in its conduct of affairs (though, it has to be admitted that exceptions do exist). One can describe the public procurement legislation as comparable to the rules in a board game. They describe what you can do, what

you have to do, when to do something, and maybe even what you are not allowed to do. In order to understand how to win the game, one need to understand the mechanics of the game and in public procurement the mechanics revolves around an economic exchange. That is, procurement, by definition, revolves around a contract which in its briefest form regulates the transfer of something from one actor to another actor, in exchange for something else. There are different descriptions of what a contract is, it may be considered to be a paper, signed by the participating actors. This view is, for example, assumed in the public procurement directives. The definition is effective, because this enables the actors to take each other to court, *i.e.* it is possible to uphold the board game rules. However, not everything can be written down in a contract. Some things are unknown at the time of contract signing (cfr. Galbraith, 1977), other things are not verifiable, as assumed in incomplete contract theory (cfr. Laffont and Tirole, 1993). Yet, those unwritten parts are part of the relationship between the actors and are lived by to a certain extent. To continue the board game analogy, the game rules may not state that you are not allowed to draw in your own squares on the board, in order to circumvent an opponent blocking your way. In other words, board games and contract are not only written clauses but they are also social norms governing the actions between the actors (see Wittgenstein, 1968 for a similar view). This view of a contract is not new (cfr. Macneil, 1973), but it does put the public procurement contract in a new light, when investigating it from an institutional match point of view. It is necessary to first describe how the economic relationship (*i.e.* the core of public procurement) between actors works, before we return to describe how institutional match are reached. In order to explain this relationship we are going to use the theory of property rights.

3. - Property Rights

A property rights approach assumes that assets are scarce, and therefore has to be allocated between actors, *i.e.* all resources cannot be used by all actors (Foss and Foss, 2000). This assumption infers a description of the relationship as a *battle of resources* where each participant tries to secure resources to safeguard its continuous existence. Sanford Grossman and Oliver Hart (1986) describe property rights as a situation where rights can be described using two attributes: specific rights and residual rights. Specific rights are the rights which are particularly regulated by a contract through the transfer of rights relating to the subject-matter

from one party to another party. In contrast, residual rights are rights relating to the subject-matter which are not transferred from the originating participant in the contract. The property rights of Grossman and Hart thus starts from a point of ownership. Other perspectives on property rights may also exist (Alchian and Demsetz, 1973) acknowledging that one asset may carry the ability to slice rights into different bundles of rights, not necessarily through contracts only. However, in this paper we will use the Grossman/Hart view as departure point for analysing public procurement contracts, as this notion is more explicitly in line with the notion of contracts and scarce resources. Thus, the theory of property rights used here is aligned with the assumption that institutions are evolutionary created in a context of scarce resources.

To offer an illustration of property rights and its implications; imagine that a woman, Lisa, owns an apartment building, with this ownership comes all rights connected to this building. Thus, she may choose to rent out a flat to Philip who needs to find somewhere to live. A rental agreement is signed which designate a specific flat for Philip to live in, for 500€ a month. In the rental agreement it is stated that Philip may use a shared washing facility in the basement of the building, furthermore, Philip has the right to use a designated storage also located in the basement. These rights, described in the contract are typical specific rights. Philip has some rights (right of usage) and Lisa has some rights (to collect a specified rent). Not all specific rights are explicitly mentioned in the contract. Though not plainly stated, one has to assume that the lease of the apartment include a right for Philip to breathe the air in the apartment, thus breathing follows the right of usages. As been stated above, the residual right consists of all other rights related to the subject-matter. Thus those residual rights may become the topic for renewed negotiations, if a buyer needs to use the asset in ways which has not been regulated as specific rights. On the other hand, a seller has the right to use its residual rights for its own purposes, provided it does not interfere with the specific rights. Assets are not always goods, or real estate, however. Assets can be human capital and staff also. A firm may for example choose to rent out its staff for the purpose of constructing a building. Such agreement does not usually imply that the buyer would have full control of construction process. That is, the buyer would not be able to, in detail, regulate who on the construction site do what, or when. The contract will feature specifications of what is built, in some cases how it is going to be built, but all other aspects regarding the use of the contractors personal will be residual rights allocated to the contractor. One view of property rights along those latter lines is provided by Hart (2003). When a public authority needs to retain control

of specific rights, or when it can relax control and let a contractor keep more residual rights. Hart observes that it may be preferential for a public authority to write a contract based on what is observable, or specifiable, by the authority. Comparing construction of a building and in-house providing services with a bundling of construction and services in a PPP he concludes:

«Arguably, prisons and schools fall into the first category: contracting on the building is relatively simple, while contracting on the service may not be. On the other hand, hospitals may fall into the second category: although specifying service quality is far from straightforward, it may be easier to come up with reasonable performance measures concerning how patients are treated than it is to specify what may be a very complex buildings» (Hart, 2003, page 74).

The essence of Hart's conclusion is not only based on what is objectively specifiable, but what is practically specifiable. For example, a hospital may be inherently complex, and while it may be possible to specify a hospital in detail, room for room, this would take a lot of time and effort. If such an effort is made anyway, it is easy to forget to put in provision for every possible situation of changed circumstances. For example, if the site for the hospital contains underground containers previously used by a gas station, the ground would need some sanitation before start of construction. If this circumstance has not been regulated by the contract, it is possible for the contractor to hold up the public authority: *We need XX Euro extra, in order to sanitise the ground.* Another example of the effect of residual rights is investments into quality. Let's say that the contractor has the opportunity to choose two different pre-fabricated curtain walling systems for the construction of the hospital. One system cost 100M Euro and has modest isolating properties, leading to increased need for heating during winter, and cooling during summer. The other system cost 200M Euro, but has good isolating properties. If the contract specifies that the contractor should run the hospital for a fixed fee, including costs for utilities, the extra cost for the second curtain walling system would be salvageable for the contractor. The contractor would be prone to make the quality investment. If the contractor is constructing the hospital on a fixed fee, and hand it over to the public authority at the end of construction, the contractor would probably not make the added investment if the investment is not a requirement in the contract. It is seen as a sunk cost by the contractor.

Organisational behaviour in public procurement, resulting from institutional rationalities, is governed by property rights. A public authority, or a private firm,

may insist on making explicit provisions in a contract, *i.e.* provisions derived from institutional rationalities are formulated as specific rights in the relationships. However, if institutional rationalities are not considered when agreeing on a contract, the residual rights may enable the participants to pursue undisclosed strategies during contract performance. That is, a private firm is able to pursue strategies, not necessarily in compliance with the public authority's institutional rationalities, if those strategies are connected to residual rights rather than being connected to specific rights (See Williamson, 2000 for a similar suggestion). This concept is widely recognised in the literature as moral hazard, opportunism, or as hold-up situations (*e.g.* Klein *et al.*, 1978). Those labels bear negative connotations, and they may indeed be negative for the public authority, but they may not automatically be founded upon a wish *to do evil*. It is quite possible for a private firm to pursue strategies contradicting the interests of the public authority without realising that this behaviour harms the authority, or puts the authority in a worse position than it would have been in, if the strategies were not pursued. The division of investment costs into salvageable and sunk costs may provide an exemplification. In economic terms, a private firm cannot be expected to invest in sunk costs. But if a concept of institutional rationalities is applied, economic terms would make up for only one branch of rationalities. Other rationalities may affect investment decisions; the private firms standing on the market or in the community could be a contradicting rationality, derived from employees' view of acceptable, or promotable, behaviour and then translated into rationalities for the organisation. Thus, a firm may be induced to make an investment into a sunk cost, even though such of an investment is not rational in an economic sense. Furthermore, a decision to invest, or not to invest, into a sunk cost could be based on non-economic factors, in some organisations. However, even if an organisation holds rationalities which counter pure economic rationalities, these would still need to be in line with the rationalities of the public authority, in order to be perceived as positive.

If participants are unable to write contract provisions which support its institutional rationalities, this may cause a disinterest towards public procurement. The citation from Hart above virtually states that if a public authority would not be able to secure its interests with a contract, the authority should not engage into that relationship. However, a public authority may not realise that the rationalities it possesses would not be adhered too during the course of the project being procured. As noted above, this may not come from a malicious intent by the private firm, but rather the private firm pursuing a conscious and intrinsically

well-motivated strategy originating in its own institutional rationalities. However, the authority will probably learn about those possible mismatches after a first time, learn more after a second time and so on. If the authority repeatedly realise that its rationalities do not match the private firms, and that the private firm takes advantage of driving strategies through residual rights, apprehension about entering a project might prevail. Even worse, there may be reasons to believe that public authorities may communicate with each other, and thus spread this apprehension between authorities, thus creating a climate of difficulties to run a project on the specific character. Those circumstances may also be transferred to the perceptions of a private firm. If a private firm gets locked into a contract where the public authority is able to hold up the private firm and as a result preventing the firm to act in accordance to its institutional rationalities, the private firm may also develop an apprehension towards public procurement projects. Akerlof (1970) portrayed a similar situation in his influential paper on 'lemons' in a more generalised manner. Akerlof describes the market for used 'lemons' cars, and assumes that the seller has the capability to determine the quality of the car, whereas the buyer has no means to find out the quality of the car. The buyer's inability to determine the quality of the car leads to a situation where the buyer is only willing to pay the price of an average quality used car, since this is the best bet. If a seller owns a good quality used car, and the seller is only able to get the price of an average quality car, the seller would not be prone to sell the good quality car. The seller would probably wait until wear and tear has reduced the quality to a level where it makes sense to sell the car for an average quality car price. In opposite, a seller who owns a bad quality car would be prone to sell this car, since the buyer would assume an average quality car. As a result, the lemon market will only hold cars of average to bad quality, which in turn will lead to a situation where no buyer would be interested in buying a used car in the first place, because all are below average quality cars. The market stagnates. Putting this into a public procurement situation, this would imply that if a public authority is not able to predict which strategies a private firm will promote using residual rights, it may not be as prone to engage in the procurement procedure, even though there might be private firms whose institutional rationalities would be aligned with the public authorities rationalities. As Akerlof points out, different institutions may arise to counter this phenomenon, for example brands, and restaurant chains (Akerlof, 1970). However, similar institutions are not readily available in European public procurement. We have stated that the public procurement legislation does not regulate how a public authority should go about its business. However the Union

rules states that every potential supplier should be treated equally and in a non-discriminative mode. As the EU court has stated «*[T]he principle of equal treatment or non-discrimination requires that comparable situations must not be treated differently and that different situations must not be treated in the same way unless such treatment is objectively justified*». (Case C-304/01, paragraph 31). Thus, a public authority may not choose a specific brand, a specific firm based on its reputation. In order to avoid a stagnation of public procurement market, some other arrangements have to exist. The public procurement market is obviously not stagnated, in general. In contract theory, this problem would be called reducing asymmetric information between the participants. In game theory, this could be called non-cooperative games. In the next section we will use latter in order to show how a public authority may act, in order to avoid hitting *lemon* projects.

4. - Convergence of Rationalities and Property Rights

A convergence of rationalities and property rights necessitates that rationalities are first made salient in order for those to be translatable into strategies. As already described, an organisation's actions can be described as the results of a set of institutional rationalities, derived from the organisational history but also from its employees and participants. In this paper we define strategies as a set of actions, established or framed in support of a group of institutional rationalities. Strategies, in this sense, are the actions taken in order to promote certain institutional rationalities. A firm is based on a notion of scarce resources (Coase, 1937), the existence of institutions are based on the same notion (Vanberg, 1997), as are property rights (Foss and Foss, 2000). Regardless of public authorities' immense power of taxation, authorities also have to be assumed to exist because of a notion of scarce resources (Rawls, 2005). These are essential assumptions to our conjecture on rationalities and property rights, because it symbolises the need to look at all inter-organisational relationships as negotiations, or games, on the distributions of those scarce resources. The purpose of participants' inter-organisational games during the conclusion of contracts is to secure the most beneficial allocation of property rights, determined from the participant's set of institutional rationalities. We assume that there are an infinite set of different strategies which a participant can employ during those games. However, some strategies may be more successful than others. If, for example, a public authority drives a strategy focusing on lowering price, and to lock in a private firm to a certain quality level, there is

a danger of the private firm to accept a low price, and the lock in, in spite of concern. This may provoke a strategy, driven by a rationality of economic soundness, to not disclose its rationalities during the game in order to later, under contract performance, use residual rights to lower quality levels to save costs. Such strategy may be against the intentions of the public authority, thus lead to a failed project. Another result of the public authority's strategy would be that no private firm do want to partake in collaboration, as described by the contract, which of course would also lead to a failure. However, if we draw from Nash (1950*b*, 1951), there should be equilibrium points, describing a state of the negotiations, where neither participant can increase their awards by employing another strategy, taking the other participants current strategy into account. The problem with Nash equilibriums is that it does not always represent the most efficient distribution of resources. If more than one participant changes their negotiation strategy there may be a more efficient solution, *i.e.* a Pareto efficient solution of the negotiation. A Pareto efficient solution to the negotiation exist when there are no other distribution of resources which can make one of the participants better off, without putting the other participants in a worse position. The negotiation between the participants thus need to include not only an equilibrium solution, but the negotiations does also lead to a solution which is Pareto optimal (Nash, 1950*a*). In practice, this can be expressed by letting one participant to secure features in the negotiation, important to secure the participant goals, as long as this can be facilitated without putting the other participants in a worse position, considering each participants individual goal. This can be achieved if each participant knows their own tastes and preferences and the other participants' tastes and preferences. That is, the bargaining would distribute competitive resources between each participant, and each participant would be allowed to gain resources which are not competed upon. However, assuming that a public authority, and *vice versa*, may know all taste and preferences of a private firm is a tall order.

In order to successfully conclude a public procurement contract, according to the lines laid down in this paper, the public authority, and the private firm, has to engage in activities identifying their operative institutional rationalities and actively signal these rationalities before or during contract conclusion. The capability to communicate the content of institutional rationalities has some advantages, because it decreases the risk that a benevolent partner would drive a strategy, which is not seen as indispensable to the operation on the cost of another participant. Furthermore, communication suggests a possibility to actually regulate those rationalities in some way or form, in the contract; in a sense, using game theoretical

terms, turning a Bayesian game to a Nash bargaining game. In other words, the ability to translate rationalities into specific rights or a negotiation strategy which support those rationalities would reduce asymmetric information between the participants in the procurement procedure. Each participant has to engage in a sense-making process, in order to make it aware of the rationalities flowing through the organisation. First when the organisation is aware of those rationalities, it is possible to make the rationalities salient during public procurement.

An essential prerequisite for achieving institutional match during a public procurement project is to reach a Pareto efficient distribution of property rights in the public procurement contract, taking into account the participants applicable institutional rationalities when determining Pareto efficiency. Institutional match has been shown to be essential for succeeding in, for example, public procurement of innovation (Rolfstam, 2009; Rolfstam, 2012*a*; Rolfstam, 2012*b*). These results are possible to extend to all procurement projects. An objection to this inference may be that some, maybe even most, procurement projects does not exhibit any failures due to institutional mismatch. Contracts valued at 2 trillion Euros are signed every year within the European Union. This argument is, however, only reinforcing the original statement. Arguably, most procurement projects involve goods and services which have been procured before. Most suppliers have delivered the goods and services involved to the same, or another, public authority before. From this, the actors on the markets, the participants in public procurement projects, have learned a lot of each other's institutional rationalities, and acquired tools to translate the situation into allocation of rights in the contract. Nonetheless, there is a lot of anecdotal evidence of procurement projects gone wrong, which are usually seen as mundane: procurement of health services, neglected public transport, cases where failure not necessarily depends on breach of contract, but rather on different strategies pursued using residual rights. In a case of procurement of a wood chip energy plant (Rolfstam, 2012*a*), seven participants with six rationalities which to different extent mismatched each other where identified. There was an NGO and a funding scheme, promoting strict specifications on sustainable technology, a land developer requiring energy to be supplied at a certain time, a local city council aiming at establishing the city as a champion in green energy, suppliers who want to deliver energy on commercial grounds, public procurers who wanted to comply with applicable legislation, a project aimed at diffusion of knowledge. The author concludes that all participants above perceived that their prioritised rationalities were set aside in one way or another, during the project. The public authority pressed product specifications, on the urging of a NCO, which did not comply

with the commercial interest of the suppliers. The public authority used a strategy to introduce specific rights into the contract, without considering the strategy of the private firms who were to supply the actual product and service. Furthermore, the time frames included in the project were in discrepancy with participating land developer, who needed to get information on how to configure developments in progress *i.e.* the developer and the project promoted two different time frames for the project, without regard to each other's tasks to fulfil in order to conclude a contract. In the case described by Rolfstam, there were many different stakeholders involved, influencing the structure of the project.

The theories we have used here to describe the convergence of institutional rationalities and property rights are not limited to one public authority and one private firm, they consider all participants in the project which are affecting the structure of the project. This includes the public authority and the contractor, but it would also include, as in the case above, state-aid funders and potential users. It is not enough for a participant in a public procurement project to only signal the strategies itself attach value too; the participant must actively seek to understand the other participants' strategies, and change its own strategy towards a Pareto optimal solution. In practice this can be done in different modes. For example early interaction before formal procurement procedures commences can provide opportunities for participants to exchange information on each other's values and interests. Furthermore the procurement procedures can, *eo ipso*, provide for opportunities in some projects, for example during a competitive dialogue. Furthermore, the conditions for contract performance should be considered to be the *magnum opus* of the negotiation game, reflecting the state of the Pareto efficiency, by adhering to appropriate specifications, reasonable time spans, and weigh need for predictability, stability and changes due to the state of the world in accordance to the outcome of the negotiation game. In this sense, institutional rationalities provide the tools to describe the actions by participants and more particularly the negotiation strategies pursued when engaging in public procurement of innovation projects. Property rights on the other hand provide restrictions to the negotiation games, and furthermore, it provides a model to describe how behaviour based on institutional rationalities are enacted or restricted in the post-negotiation stage of a public procurement of innovation project.

5. - Conclusions

In conclusion, our conjecture can be described as series of steps in connecting an institutional analysis with the process of negotiation and contract execution. Our assertion is that institutional rationalities can be translated to a set of actions, which can be analogically described as negotiations strategies. In order to achieve an institutional match, the result of the negotiations does not only need to be in-coherence with those rationalities, but the contract has to be objectively supportive of those rationalities. It is suggested to be helpful for the analysis to treat this negotiation as a bargaining game, where each participant is allowed to improve its position as long as the strategy does not put the other participants in a worse position than they were in before the application of the strategy. In order to make this analysis applicable, the contract is to be understood as a set of specific and residual rights, where both set of rights has to support the strategies being pursued. The ramifications of the thoughts presented in this paper may be quite extensive, as they imply that change of regulations would not ease public procurement of projects – instead changes that may lead to improved contract performance as well as project outcomes should be sought after on endogenous levels, which is in line with assertions made for institutional analysis of public procurement of innovation (Rolfstam, 2012*b*). The implicit call for other explanation variables in other institutional levels than formal law is also consistent with previous literature (Hollingsworth, 2000; Coriat and Weinstein, 2002); an analysis that focuses on single institutions «may altogether miss the genuine importance of institutions in the economy, which is of a combinative nature» (Amable, 2000, page 647).

The need for all participants to communicate the strategies pursued during contract conclusion is essential, if the probability of success is going to be improved. This conclusion has several implications for conducting public procurement of innovation. Public authorities need to investigate its own institutional rationalities, or investigate the strategies flowing out of those rationalities, and from this position develop plausible strategies to secure its interest during public procurement. It is also necessary to communicate these strategies in order to secure an efficient distribution of rights in the contract to be concluded. This notion would apply to other participants as well, for example funders and commercial undertakings. Driving the point a bit further, a public authority need to develop procedures, which allow the authority to receive strategies communicated from other participants, and let the other participants to pursue those strategies, insofar they do not counter-act its own strategies in a significant magnitude. That is, the

public authority cannot lock the terms of the contract, before investigating applicable strategies; this can be done through early involvement of participants, or by employing a procurement procedure which would allow for such involvement. The communication of strategies is essential for success, but it is important to note that not all projects may allow for an appropriate solution to be developed. It may be that even if an equilibrium state is reached, and even if it is Pareto efficient, it may be that the result is not attractive to one or more participants. This would entail that the project fails, or at least changes character. One approach to resolve such situations would be to *insource*, that is, a public authority may choose to produce the product or service being the subject-matter by developing or using the intrinsic organisational capability.

The approach taken in this paper has not included an analysis of the regulations on public procurement. The reason for this is that the regulations, in the European Union, do not regulate how to conduct a public procurement project. Instead the regulations are formulated as different rules put in place to ensure equal treatment and non-discriminatory behaviour by public authority, in general, and in public procurement procedures. They do not contain rules for the content of the contract, or how to arrive at a specific contract wording. The obvious exception to this is Akerlof's suggestion of using trademark and brands to signal intentions of commitment to quality. Such practice would not be allowed when applying the public procurement regulations. Nonetheless, this restriction does affect one mode of signalling only. Other practices of signalling may prove to hold higher predictive power towards which strategies a participant may pursue during contract conclusion. This submission does not extrapolate to an inference that regulations do not hold any role in the conclusion of contracts. They can be considered to be exogenous institutions, affecting the institutional rationalities of, foremost, the public authority. As shown in the case presented by Rolfstam (2012a), a private firm driving a strategy inducing time frames shorter than possible, complying with the advertisement rules in the directives. Such behaviour may cause dissonance if the public authority has a strong bias towards complying with the directives. Thus, it seems to be more important to include desirability to comply with the regulations as one strategy, to indicate and include in contract conclusion. In some cases, with participants inexperienced in public procurement, this may include educating participants as to the rules, and their implications. If participants are experienced, education may be superfluous, and inefficient, however intentions may still be needed to be communicated, in the odd chance the participants has experience with authorities being more liberal towards the regulations.

Our conjecture would suggest that policy on public procurement for innovation should be directing helping participants to reach suitable solutions for public procurement of innovation. Furthermore, the approach which the participants enter a public procurement of innovation project needs to be changed. The process has to be structured in a mode which allow for communication, often even before the formal procedures commences. This conclusion provides an alternative interpretation of the perceived lack of interest of using PPI as policy tool for innovation. If this view is viable it may suggest that efforts on changing the current public procurement regulations will not lead to an increase of public procurement of innovation projects, nor would it change the quality of those projects. We do not make any inference on the efficiency of state aid, in order to support public procurement of innovation. Aid may indeed help counter act, for example, a public authority's interest in using its funds carefully. However, the presence of such funding implies that the funder has to be able to partake and consider the other participants' strategies in order for the contract to be Pareto efficiently allocated to all participants. A lack of understanding of the actual process of concluding public procurement of innovation contracts may cause an apprehension towards participating in innovation projects. A public authority, private firm or a state-aid grantor may draw the conclusion that efforts to engage in public procurement of innovation are inefficient, maybe even impossible, if they repeatedly engage in projects where their institutional rationalities are threatened. This risk can be mediated only by increased efforts to explain and understand the process of achieving a successful partnership in public procurement of innovation projects.

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III - CHALLENGES IN PUBLIC PROCUREMENT

Favouritism and Inefficiency in Procurement: Evidence from Public Works in Italy

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This paper shows how favoritism in public procurement can emerge despite the use of rigid procedures for awarding contracts and of transparent criteria for allowing firms to bid. The paper analyzes data on the awarding of public works in Italy to illustrate how differences in fine regulation details across Italian local administrations have major implications in terms of favoritism toward local contractors and the overall efficiency of the procurement process. The findings are a cautionary tale about the benefits and risks of a decentralized procurement regulation and a warning about the problems facing green and innovation procurement.

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1. - Introduction¹

The procurement of public works is typically characterized by the use of rigid and transparent institutions to foster competition between contractors and limit the risk of corruption. In terms of the procedures used to award the contracts, this is often reflected in the widespread usage of sealed bid auctions. Moreover, the right to enter and bid in these auctions is granted on the basis of objective qualification criteria that should not create favoritism toward any specific contractor. Nevertheless, this paper shows that, even in systems that are formally rigid and transparent, favoritism can emerge through the fine design of the regulations for entry criteria and the awarding rules.

In particular, this paper analyzes the case of the procurement of public works in Italy focusing on different changes that occurred at local levels in the regulations of both the entry criteria and the awarding rules. In the next section, the paper describes in detail the legal framework to illustrate how formally these local reforms appeared not to alter the rigidity and transparency characterizing the national public procurement regulation. Then, it presents a theoretical framework that permits us to discern virtuous and vicious local reforms in terms of whether they induced an unfair advantage to local contractors. Exploiting differences in the timing of the adoption of these reforms, data from the years 2000 to 2008 are used to quantify the effects of these regulatory changes on the auction outcomes. Finally, the paper concludes with a series of policy implications describing the challenges an excessively decentralized procurement regulation poses for green and innovation procurement.

2. - The Legal Framework: Entry Criteria and Awarding Rules

Local authorities (regions, counties and municipalities) award around 54 percent of all the public work contracts. Since each of the 20 regions, 110 counties and 8,092 municipalities can produce regulations affecting public work contracts, the Italian regulation of public works is a rather complex blend of national and local regulations. The national regulation is contained in the Public Procurement Code (henceforth the “PPC”). Article 4.3 of the PPC expressly prohibits local

¹ The authors wish to thank Cristina Petrassi for her help with the survey and analysis of regional sources of law. The opinions expressed in this research work remain, in any case, the sole responsibility of the authors and do not necessarily reflect those of Boston University or the Bank of Italy.

regulation, among other things, of the qualification and selection of private contractors, award procedures and criteria. However, local administrations have frequently produced regulation in violation of this article and attempted to defend their doing so as a constitutional right. On different occasions the Constitutional Court has intervened to affirm the legitimacy of the provisions of Article 4 of the PPC, rejecting the appeals of many regions alleging infringement of the division of competences under Article 117 of the Constitution, and linking the principles of publicity, transparency and equal treatment to the protection of competition, attributed to the exclusive legislative powers of the State pursuant to Article 117(2)(e) of the Constitution.²

The national regulation governing public works has undergone a number of reforms over the last fifteen years³ in response to, among other things, EU law aimed at improving the “design” of award procedures and enforcing the principles of publicity, transparency and equal treatment⁴. Currently, the national legislation related to procedures for the awarding of public works contracts is mainly contained in Legislative Decree no. 163 of 12 April 2006, which was enacted on 1 July 2006, and Presidential Decree no. 207 of 5 October 2010, that includes the

² See, among others, the sentences of 23 November 2007, no. 401; 14 December 2007, no. 431; 2 August 2008, no. 322; 18 December 2008, no. 411. Before the reform of Title V (pursuant to Constitutional Law no. 3 of 18 October 2001, *Amendments to Title V of Part II of the Constitution*), the field of public works of regional interest fell within the concurring legislation: then regions could dictate legislative provisions within the limits of the fundamental principles established by the laws of the State, insofar as the same are not in conflict with the national interest or that of other regions (see Article 117(1) of the Constitution, in the formulation prior to the reform). However, greater degrees of autonomy were granted to special statute regions and autonomous provinces, in accordance with their respective statutes. See De NICTOLIS R. (2010).

³ See DECAROLIS F., GIORGIANTONIO C. and GIOVANNIELLO V. (2010).

⁴ There are now three different systems for selecting contractors: *i*) for “strategic infrastructures”, aimed at giving high priority to these projects; *ii*) as introduced by Law 2009/2 of 28 January 2009, for projects falling within the National Strategic Framework; *iii*) the “ordinary” system, governed by Legislative Decree no. 163 of 12 April 2006, known as the Public Procurement Code (PPC), for all other types of project. In this paper we analyse the “ordinary” system, which applies to most projects. Note the existence of derogations for tenders involving contracts below the EU threshold, which is currently €5,000,000 for tenders for public works and concessions (see DECAROLIS F., GIORGIANTONIO C. and GIOVANNIELLO V., 2010). This paper focuses on traditional procedures for the assignment of public works. *In-house* contracts, which are strictly limited by the PPC, are not dealt with, nor are concession contracts (construction and management), which are characterized by very specific issues. For the peculiarities of public-private partnership contracts, see GIORGIANTONIO C. and GIOVANNIELLO V. (2009); CORI R. - GIORGIANTONIO C. - PARADISI I., 2010).

regulation for the implementation and execution of the PPC and entered into force, subject to certain conditions, on 9 June 2011. A brief discussion follows, also acknowledging the changes that occurred between 2000 and 2010 – the time period to which the dataset analyzed in this paper refers. In particular, we will focus on the following aspects: *i*) entry qualification requirements for companies; *ii*) award procedures (and the assessment of so-called abnormal tenders or abnormally low offers). For each of these two aspects, after having discussed the national regulation, we discuss the local reforms that affected it.

2.1 *Entry Criteria for Contractors*

The national regulation about entry criteria is rather straightforward. It mandates that the contracting authority finds, on the basis of the law and the characteristics of the work, the objective and non-discriminatory requirements which must be satisfied by companies to participate in the tender. The possession of these requirements is mainly certified through a system called qualification of enterprises, introduced by Law no. 415 of 18 November 1998 (the “Merloni-ter” law) and Presidential Decree no. 34 of 25 January 2000 (now replaced respectively by the PPC and Presidential Decree no. 207 of 5 October 2010). Under this system the certifying bodies (“SOA”s) are responsible for ensuring that companies meet the technical, financial and management requirements necessary for the purposes of the granting of public works contracts.⁵ The possession of the certificate issued by the SOA is a necessary requirement for participation in the award procedure of public works contracts for amounts exceeding €150,000. The qualification has a five-year term. In the third year, however, the firm has to prove it still satisfies all the requirements.

Under this system, the administration awarding the contract has little discretion. Once it has determined the contract reserve price (*i.e.*, the maximum price it is willing to pay) and the typology of work (using a predefined classification system), then it must admit to the auction all the firms that have the SOA certification adequate for the type of work and contract reserve price.

As regards the regional legislation, numerous changes relative to the national regulation were introduced. Some of these modifications were short lived since they were declared unconstitutional by the Constitutional Court because they were in violation of the principles concerning the protection of competition and

⁵ See DECAROLIS F., GIORGIANTONIO C. and GIOVANNIELLO V. (2010).

equal treatment. We will focus on three cases of local reforms affecting the Valle d'Aosta, Friuli Venezia Giulia and Sardinia regions.

Valle d'Aosta set up a regional register for firms and provided that entry in the register was a mandatory requirement for participation in award procedures for contracts whose value is below the EU threshold.⁶ These provisions were declared unconstitutional in 2001, but the register was only finally repealed in 2005.⁷ However, Valle d'Aosta immediately introduced other measures to favor firms located within the region.⁸ In particular, it introduced "better suitability of localization" among the selection criteria. Only in 2006, when this latter regulation was ruled unconstitutional, Valle d'Aosta reverted to the national regulation in terms of entry criteria.⁹

In Friuli Venezia Giulia, between 2002 and 2003 contracting authorities were allowed to give priority to firms located in the region.¹⁰ Starting from November 2006, for the award of public works contracts whose value was below the EU threshold through restricted procedures (see definition below),¹¹ Friuli Venezia

⁶ Entry in the register was conditional on the adequate and efficient organization of the firm in the Region.

⁷ See Article 23 of Regional Law no. 12 of 20 June 1996, amended by Regional Law no. 29 of 9 September 1999. The Constitutional Court declared the unconstitutionality of this provision with the sentence of 26 June 2001, no. 207. Article 23 was definitively repealed by Article 45(1), letter *a*), of Regional Law no. 19 of 5 August 2005.

⁸ Public works contracts whose value was equal or less than €1.2 million: see Article 26(2) of Regional Law no. 12 of 20 June 1996.

⁹ See the sentence of 22 December 2006, no. 440, which declared the unconstitutionality of Article 26(2), (c), of Regional Law no. 12 of 20 June 1996, as amended by Article 25 of Regional Law no. 19 of 5 August 2005, which provided that – if the number of qualified participants exceeds the maximum set by the tender – the contracting authorities could choose the firms to be invited according to the requirement of the "better suitability of localization", determined by both the absolute value and the percentage of the number of employees of the firms registered with the regional offices of the National Institute of Social Security in the year prior to publication of the call for tenders.

¹⁰ See Article 24 of Regional Law no. 14 of 31 May 2002, which states that "contracting authorities are free to introduce into the "economically most advantageous offer criterion" priority criteria for firms that meet the following requirements: *a*) registered office with at least three years in the region at the date of the call for tender; *b*) works carried out in the region in the three years preceding the date of the call for tender, similar to those to be carried out". This provision was repealed with effect from April 2003, leaving the option for the contracting authorities to require the contractor to maintain an operational office in the region for the duration of the works: see Article 24 of Regional Law no. 14 of 31 May 2002, modified by Regional Law no. 12 of 30 April 2003, which became effective on 5 May 2003.

¹¹ See Article 20 of Regional Law no. 14 of 31 May 2002.

Giulia introduced another requirement for the selection of firms. “Organizational and dimensional suitability” criteria were added and, importantly, among the parameters used there was the number of employees of the firm registered with the Friuli Venezia Giulia National Institute for Social Security. In essence, this meant that only firms employing a sufficiently large number of Friuli workers were allowed to bid.¹²

Sardinia in 2002 set up a regional register for firms and mandated inclusion in that register for participation in award procedures. These provisions were amended in 2003 eliminating entry in the register as a mandatory requirement and they were declared unconstitutional in late 2011, because they damaged the exclusive legislative powers of the State in the field of protection of competition.¹³

2.2 Award Rules

What the economics literature defines as award rule (or auction formats) is determined in the Italian regulation by the combination of three elements: *i*) the award procedure, *ii*) the award criterion and *iii*) the automatic exclusion of abnormal tenders. As regards the award procedures, the PPC distinguishes between open and restricted. In the open procedure¹⁴ the administration publishes a call for tender containing, among other things, an accurate description of the subject of the contract. The call for tender precedes the presentation of the offers by all interested parties, whose fulfillment of the requisites is verified when the bids are assessed. The restricted procedure¹⁵ and the “simplified restricted procedure” applying to works worth less than €1.5 million¹⁶ provide for an initial prequalification phase to ascertain requisites and identify the enterprises to invite on the basis of predetermined objectives and non-discriminatory criteria, and a subsequent

¹² See Article 3 (1) (c) of Presidential Decree no. 374 of 11 November 2004, as modified by Article 1(1) of Presidential Decree no. 328 of 27 October 2006, which became effective on 23 November 2006.

¹³ See Article 2(1) of Regional Law no. 14 of 9 August 2002, which became effective on 9 August 2002, and Article 4(10) of Regional Law no. 13 of 23 December 2003, which was declared unconstitutional by the sentence of 7 December 2011, no. 328.

¹⁴ Called “*pubblico incanto*” (public invitation to bid) in Law no. 109 of 11 February 1994, (the Merloni law).

¹⁵ Which the Merloni law calls “*licitazione privata*” (closed tender).

¹⁶ This threshold, originally €750,000, was raised to €1 million by Legislative Decree no. 152 of 17 October 2008 (known as the Third Corrective Decree of the Public Procurement Code) and entered into force on 17 October 2008. The threshold was then raised to €1.5 million under Decree Law no. 70 of 13 May 2011 (known as the Development Decree) and became effective on 14 May 2011, converted into Law no. 106 of 12 July 2011.

phase, where the entity only invites bids from the chosen subjects. In short, in open procedures the administration must specify the full characteristics of the service both in the call for tender and in the related auction documentation, while in the restricted procedure these descriptions can be included in the invitation letters. However, in the Italian system there is not that great of a difference between the open and restricted procedures. The regulation says that in all “ordinary” restricted procedures for the assignment of public works worth less than €40 million all applicants possessing the requirements listed in the call for tender must be invited to participate.¹⁷ Therefore, all procedures are essentially open procedures.

The second key rule concerning contract awards is the specification of the criterion for determining the winner. Both procedures can use either the “lowest price” criterion or the “economically most advantageous offer” criterion (until 1 July 2006, when the Public Contracts Code was enacted, the lowest price was the “ordinary” award criterion).¹⁸ Under the “lowest price” criterion, the enterprise offering the lowest price is awarded the contract, provided that this price is judged to be “reliable”, pursuant to the regulations governing abnormal tenders; under the “economically most advantageous offer” criterion, not only price but a range of other parameters specified in the call for tender are assessed (e.g. the quality of the work or the time for completion as provided for in Article 83 of the PPC).

The third key element concerns the special rules for the assessment of so-called abnormal tenders or abnormally low offers (contained in Articles 86-89 of the PPC and Article 121 of the new Execution and Implementation Regulations), *i.e.* discounts on the publicly announced reserve price that fall below a threshold of “presumed anomaly”. This threshold is generally an endogenous function of

¹⁷ See Article 55(6) of the Code. Articles 62(1) and 62(2) state that in restricted procedures for works worth €40 million or more, a general government entity – when so required owing to the difficulty or complexity of the work – may limit the number of candidates invited. When it does so, the PA must indicate in the call for tender the objective, non-discriminatory criteria, according to the principle of proportionality, that it intends to apply, the minimum number of candidates it intends to invite and – if it thinks is appropriate for motivated needs – the maximum number. In any case, the minimum number of candidates may not be less than ten, provided that there at least that many suitable candidates. See DECAROLIS F., GIORGIANTONIO C. and GIOVANNIELLO V. (2010).

¹⁸ While the recourse to the economically most advantageous offer criterion was limited to specific circumstances: see Article 21 of the Merloni law.

the bids.¹⁹ Different methods to compute the threshold are used when the criterion is the economically most advantageous offer.²⁰ Offers thus identified, presumably too low to be considered reliable, must be subjected to a congruity check in debate with the interested parties before any exclusion decision.²¹ An anomaly check is carried out in the next phase of the bid assessment, with a request to the bidder to supply justifications for the price offered.²² In any case, before any exclusion the interested parties must be heard, so that they may indicate any element considered useful. Until 1 July 2006, for contracts below the EU threshold (about €5 million) awarded at the lowest price, for which at least five tenders were submitted, it was imperative to automatically exclude (without hearing the enterprise) all bids below the anomaly threshold. After that date, the latter mode of exclusion became purely optional (provided it was stated in the call for tender). Then, when

¹⁹ In this case, verification is made on offers with a discount equal to or larger than the arithmetic mean of the percentage discounts of all the offers admitted, excluding the highest 10% and lowest 10% of offers (rounded to the next highest integer), increased by the mean arithmetic deviation of the discount percentages that exceed the aforementioned mean; however, if the number of offers admitted is less than 5, this criterion is not applied and the verification is made on offers that appear incongruous on the basis of specific elements. When the criterion of automatic identification of the anomaly threshold is not applied, the administration verifies bid reliability.

²⁰ In this case a check is made of bids in which both the scores relating to the price and the sum of scores relating to the other assessment elements are equal to or greater than four-fifths of the corresponding maximum scores stated in the call for tender.

²¹ The choice of subjecting to a congruity assessment any other bid that appears abnormally low according to specific elements remains in any case at the government entity's discretion.

²² In particular, general government entities require the justifications concerning the price items and other assessment elements of the offer and judge these elements (Article 86 of the PPC). These justifications may concern, for example, the costs of the construction procedure or of the production process, the technical solutions adopted, the exceptionally advantageous terms that the bidder can offer, and so on. However, the purpose of the anomaly check is not to detect specific individual inaccuracies but to ascertain the reliability of the offer as a whole (the decision of the Supervisory Authority for Public Procurement (AVCP), 8 July 2009, no. 6). Law no. 123 of 3 August 2007 added to Article 86 of the PPC paragraphs 3-*bis* and 3-*ter*, specifying that the contracting entities are required to determine that the economic value is appropriate and sufficient in respect to cost of labour and costs related to safety, which must be specifically indicated and must prove to be congruous with the extent and characteristics of the work to be carried out. Safety costs cannot be the object of bidding discounts. It is also possible to nominate a specific commission to carry out assessments regarding the congruosity of the offer: as stated in Article 121, paragraph 5, of the new implementing regulations, this commission should be composed of personnel internal to the administration, except in cases of motivated staff shortages or lack of the necessary technical competencies.

the Third Corrective Decree of the PPC became effective (17 October 2008), this possibility was limited to contracts with a value of less than or equal to €1 million and only if at least ten bids were admitted.²³ Recently, the Development Decree (enacted on 14 May 2011) provided again (until 31 December 2013) for the possibility to automatically exclude all bids below the anomaly threshold for contracts below the EU threshold (see Article 253 (20-*bis*) of the PPC).

Moreover, there is the possibility to use negotiated procedures, marked by significant discretionary powers for the administration, given that general government entities consult their chosen economic agents and negotiate the conditions of the contract with one or more of them. Insofar as these procedures represent a derogation to the general ban on renegotiating offers, they should be exceptional, being admissible only when specific conditions apply (chiefly those related to urgency or lack of appropriate offers or applicants). In this essay, we will ignore these procedures albeit in recent years their importance has grown thanks to the enlargement of the set of contracts for which they are usable.

To summarize the national regulation concerning award rules and to link it to the economic literature, note that what this literature calls “auction formats” corresponds to a combination of three parts: an award procedure, an award criterion and an (automatic or non-automatic) exclusion procedure for abnormal tenders. More particularly, it is possible to reduce the prescribed procedures and criteria to four “auction formats”: *i*) *first price auctions*, FP; *ii*) *average bid auctions*, AB; *iii*) *scoring rule auctions*, SR; *iv*) *negotiations*, N (cfr. Table 1)²⁴.

²³ See Articles 122(9), and 86(1) of the PPC. These changes were introduced in the wake of criticisms against Italy in relation to the contrast of the previous regime with the EU principles on competition law: cfr. ECJ judgment of 15 May 2008, joined cases C-147/06 and C-148/06.

²⁴ In more detail, *i*) FP auctions consist of open and restricted procedures adjudicated with the criterion of the lowest price without the automatic exclusion of abnormal tenders; *ii*) AB auctions consist of open and restricted procedures adjudicated with the criterion of the lowest price and the automatic exclusion of abnormal tenders according to the “averaged mean” method; *iii*) SR auctions consist of open and restricted procedures adjudicated according to the criterion of the most economically advantageous tender; *iv*) negotiations consist of negotiated procedures and piecework contracts. From the point of view of economic theory, competitive dialogue (which has been in place in Italy since 8 June 2011) can be considered, given its characteristics, as a particular type of negotiated procedure. On the subject of why the Italian system is structured according to this quadripartition and on the associated costs and benefits, see DECAROLIS F., GIORGIANTONIO C. and GIOVANNIELLO V. (2010).

TABLE 1

ITALIAN AUCTION FORMATS				
<i>Award procedures</i>	Auction (Open Procedure + Restricted Procedure + Simplified Restricted procedure)			Negotiation (Negotiated Procedure + Piecework contracts)
<i>Award Criterion and Exclusion Method for Anomalous Offers</i>	First Price (without automatic exclusion)	First Price (with automatic exclusion)	Economically Most Advantageous Offer (without automatic exclusion)	Economically Most Advantageous Offer and First Price (with and without automatic exclusion)
<i>Format</i>	FP	AB	SR	N

*Source: DECAROLIS F., GIORGIANTONIO C. and GIOVANNIELLO V. (2010).

As regards the local regulation of award rules, it differs from the national legislation in a number of profiles. For this reason, the Constitutional Court has intervened several times to censor local legislation. The most salient departures concern the AB auctions and thus we mostly focus on this format. The local legislation seems to prefer the automatic exclusion of abnormal tenders for public works contracts whose value is below the EU threshold, awarded in accordance with the criterion of the lowest price, albeit with many variations especially as regards to methods for computing the threshold of “presumed anomaly”. This is illustrated by Table 2 which reports the main deviations from the national AB induced by local changes in the regulation.

TABLE 2

AB FORMAT IN THE NATIONAL AND LOCAL REGULATIONS

	<i>Validity</i>	<i>AB Auction Rules</i>
National Criterion	Since 1998	The winner is the firm offering the highest discount among those lower than A2, where A2 is the average between all the discounts that remain after excluding from the pool of bids 10% of the highest discounts and those equal or lower than A1, where A1 is the mean of all the discounts that remain after excluding the top and bottom 10% of all discounts.
Valle d'Aosta Region	Since 2005	Calculate A1 and A2 as in the national criterion. Then, the winner is the firm offering the discount closest to the mean between A1 and a randomly chosen number (among the 9 numbers partitioning in equal subintervals the distance between A2 and 10 percent of bids).
Friuli Venezia Giulia Region	Since 2002	The winner is the firm offering the discount closest (from below) to the mean of all the discounts remaining after excluding the top and bottom 10% of all discounts received.
Sicily Region	Since 2005	The winner is the firm offering the discount equal (or closest from below) to a value A3 calculated as follows: draw an integer between 11 and 40, this number will be the percentage of the bottom discount to exclude, while the difference between 50 and this number is the percentage of top offers to exclude. Calculate the mean of the remaining offers and then, if the integer previously drawn is between 11 and 24, add the standard deviation of bids and call this A3. If instead the integer was between 26 and 40, subtract from the mean the standard deviation and call this A3. If the integer is equal to 25, then A3 is equal to the mean. This bids elimination process occurs only with at least 5 bids.
	Since 2010	Reintroduction of the national criterion.
Sardinia Region	Since 2007	Automatic exclusion occurs if at least 5 (not 10) offers are placed.
	Since 2011	Reintroduction of the national criterion.
Turin City and Province	Various	It is forbidden to use any form of automatic exclusion of bids.

To illustrate how the rules described in Table 2 are applied, the following example shows how to determine the winner under various forms of the AB rule given a fixed set of 17 discounts offered. These 17 discounts are reported, in increasing order in the first row (Discount).

TABLE 3

EXAMPLE OF THE FUNCTIONING OF THE AB FORMAT

Discount	1	4	5	7	10	12	13	15	16.1	17.3	18.1	18.5	19	19.3	19.5	19.7	20
National										W							
Friuli V.G.							W										
V. Aosta					W												
Sicily										W							

In a FP auction, the winner is the firm offering a discount of 20. Instead, according to the national criterion for the AB format, the winner is determined by excluding the top and bottom 10% of the bids (*i.e.* the bids equal to 1, 4, 19.7 and 20), then calculating the mean of the remaining discounts (called A1, in the above example A1=14.6), then calculating the mean of the discounts above A1 and below the top 10% of bids (*i.e.*, above 14.6 and below 19.7). This second mean is called A2 and equals 17.85. The winner is the closest contender from below to A2 and in the example this is the discount equal to 17.3. Under the Friuli version of the AB format, the winner is the closest from below to A1, this is the bid equal to 13. For the Valle d'Aosta region, an integer must be drawn at random among the 9 numbers partitioning in subintervals of equal size the interval between the distance between A2 and the first discount higher than the bottom 10% discounts (*i.e.* a discount of 5 in this example). Assuming that we draw the lowest of the 9 values and then take the mean between this value and A2, we find that the winning bid is the closest from below to 11.2, which is the discount equal to 10. The last case is that of Sicily²⁵. We need to draw an integer and we assume that we draw 40. Thus, we exclude 40% of the lowest bids and 10% of the highest bids. The mean among the remaining bids equals 18.25. We subtract from this number the bids standard deviation (equal to 1.21) and find that the winner is the firm offering the discount equal or closer from below to 17.04: this is the discount of 16.1. As a last remark, note that to illustrate the functioning of the different AB rules we held fixed the values of the 17 bids. However, it is very unlikely that these different AB formats would lead to observing the same bids distribution.

²⁵ See Article 1(6)(b) of Regional Law no. 16 of 29 November 2005, became effective on 3 December 2005. Starting from 2010, Sicily established a substantial reference to national legislation: see Regional Law no. 16 of 3 August 2010 became effective on 7 August 2010 and – after – Regional Law no. 12 of 12 July 2011 became effective on 29 July 2011.

Finally, note that Valle d'Aosta and Friuli Venezia Giulia²⁶ still require the mandatory use of the automatic exclusion of abnormal tenders for contracts of value is below the EU threshold, awarded in accordance with the criterion of the lowest price. Sardinia had also made provision for the automatic exclusion of abnormal tenders for public works contracts whose value is below the EU threshold, awarded in accordance with the criterion of the lowest price, but only on a voluntary basis. However, recently (June 2011), the Constitutional Court declared the unconstitutionality of the system adopted by Sardinia, stating the applicability of the PPC.²⁷

3. - Theory Overview

This section begins with an illustration of why rigid awarding rules and transparent entry admission criteria play a central role in public procurement.²⁸ Then it presents the theoretical arguments according to which we assess the *pros and cons* of the local regulation reforms.

3.1 *Award Rules and Entry Criteria*

The element that most markedly differentiates private from public procurement is the separation, present only in the latter, between the entity awarding the contract and that paying its cost. This has led the literature to cast the public procurement problem as a form of principal agent problem where the general public is the principal benefiting from the realized public work and the administration is the agent awarding the contract. Since the principal cannot perfectly monitor the agent, the principal faces the risk that the agent deviates from what would be ideal for the principal. Seen in this light, the institutions governing public procurement are meant to discipline the behavior of the administration in order to ensure that its acts benefit the citizens.

²⁶ See, for Valle d'Aosta, Article 25 of Regional Law no. 12 of 20 June 1996, amended by Regional Law no. 29 of 9 September 1999, became effective on 22 September 1999, and was later amended by Regional Law no. 19 of 5 August 2005, which became effective on 21 September 2005; for Trento, Article 40 of Provincial Law no. 26 of 10 September 1993 and Article 24 of Presidential Decree no. 12-10/LEG of 30 September 1994; for Friuli Venezia Giulia, Article 25 (2) of Regional Law no. 14 of 31 May 2002 became effective on 19 June 2002.

²⁷ See the sentence of 20 June 2011, no. 184, which declared the unconstitutionality of Article 20 (8) on Article 20 (9) of regional Law no. 5 of 7 August 2007.

²⁸ A more in depth discussion is contained in DECAROLIS F., GIORGIANTONIO C. and GIOVANNIELLO V. (2010)

Corruption and similar cases where the agent gains a personal benefit at the direct expense of the principal are the situations where the preferences of the principal and the agent diverge the most. To contain the risk of corruption, procurement regulations give a prominent role to the use of rigid procedures to procure public contracts: constraining the actions of the agent and imposing transparency are thus essential.²⁹

Regulations often implement these ideas by mandating the use of sealed bid auctions that are both rigid and transparent mechanisms. Moreover, auctions have additional benefits. For outsourced works, when the sole objective is cost minimization and there are at least two enterprises capable of carrying out the works, the optimal mechanism is the lowest-price auction (FP) with an optimally set reserve price³⁰. This mechanism makes it possible to overcome the information asymmetry between PAs and enterprises³¹, as competition pushes the latter to disclose their costs, at least in part³². What is more, the mechanism also gives the enterprise with the lowest cost the best chance of winning (ensuring “allocative efficiency”).

Regulating entry is equally important to prevent corruption. No matter what auction format is used, the administrations should not be allowed to discretionally exclude firms. Furthermore, to foster competition, open auctions where all bidders can enter are typically recommended. Nevertheless, a second major risk characterizing procurement is that of bidders default. We take a broad view according

²⁹ See LENGWILER Y., WOLFSTETTER E. (2006) and the references mentioned therein.

³⁰ MYERSON R.B. (1981). The term auction reserve price (or starting price) is the highest price the PA is willing to pay. One obstacle to optimality of FP auctions is that determining an optimum starting price implies the PA's knowledge of the distribution of costs of the enterprises. But even in absence of such data, theory suggests that the price ought to be: *i*) lower than the opportunity cost of not awarding the contract when firms' costs are mutually independent; *ii*) equal to the opportunity cost when firms' costs are not independent. In the Italian context, this opportunity cost consists of the total cost of a second auction (*i.e.* the expected cost of the works, plus that of the second auction and of the delay). The intuition underlying the result, by which the optimal starting price is below the opportunity cost, is that this should prompt enterprises to offer lower prices. Naturally, this also implies that in some cases the contract may not be awarded.

³¹ Information asymmetry is the essence of the problem of selecting the private contractor: LAFONT J.J. and TIROLE J. (1993).

³² The enterprise faces a trade-off: the lower its mark-up, the more likely it is to win, but the lower the expected profits. For a business that wants to maximize profits, as the number of competitors increases the mark-up has to be reduced, to offset the decreased likelihood of winning (with more competitors, there is a higher probability of finding a very efficient enterprise to award the contract to). MYERSON R.B. (1981).

to which a bidder default encompasses every type of misperformance on a contract obligation. Thus, not only fully failing to deliver, but also delaying the project completion and requiring price renegotiations. The aim of limiting the risk that the winning firm may fail to carry out what it promised in the tender phase is the idea motivating the widespread use of entry criteria like those described earlier for the national regulation.

Similarly, the risk of default also shapes the types of auction formats. In contrast to a simple setting where bids are binding commitments, the presence of default risk makes the FP undesirable. As discussed in Decarolis (2009), an ample literature in auction theory shows that FP by exacerbating competition produces low awarding prices, but high chances of *ex post* default, typically causing a cost of procurement that is overall higher than under alternative mechanisms.

The AB auction is an auction format that was designed with the explicit purpose of limiting the default risk. Decarolis (2009) who shows that the type of ABA used in Italy has a unique equilibrium in which all bidders offer a price equal to the auction reserve price. Since a fair lottery is used to award the contract when this happens, the allocation of the contract is random across all bidders. This bidding behavior has an intuitive explanation: in order to win, every bidder (or coalition of bidders³³) tries to guess where the other bidders are guessing where the relevant trim mean will lie, which creates a concentration of bids in a narrow range. The public disclosure of past winning discounts implies that these discounts can work as a simple coordination device to determine the range within which discounts will lie. Taken together, these findings imply that low *ex post* performance is less likely in AB relative to FP auctions because: (i) due to the randomization the most risky firms are not more likely to win and (ii) due to the high winning price the winner receives a larger payment from completing the job.

Avoiding defaults is possible through mechanisms different from the AB auction. For instance, to preserve the benefits of FP auctions while limiting the performance risk, three main systems are typically used: (i) financial guarantees to support bids, (ii) *ex ante* pre-qualification requirements for bidders and (iii) *ex post* screening of bids reliability. From a theoretical perspective, each of the three systems, or their combinations, could in principle solve the risk of *ex post* per-

³³ CONLEY T.G. and DECAROLIS F. (2012) extend the analysis to the case of bidders forming coalitions. They show that previously described equilibrium under full competition is weak to collusion, but that even with collusion the allocation resembles an unfair lottery and the awarding price is higher than in an FP, although lower than the reserve price.

formance. The Italian system requires only partial insurance, bidder pre-qualification (in the form of the entry criteria described earlier) and allows administrations to conduct *ex post* screening. However, since the regulations mandate that administrations screen bids using in-house personnel, the process is onerous for small administrations lacking the engineers and lawyers that typically follow this process. This explains the frequent use of AB auctions which ensure low default risk without the need to screen bids. However, this format is clearly highly inefficient given its quasi-random allocation of the contract.

3.2 *An Evaluation of the Local Reforms*

The previous discussion allows us to better understand the content of the local reforms described in section 2. Starting from the reforms of the award rule, a negative assessment can and must be given to those reforms that have introduced variations to AB auctions in contrast with national rules and without tackling the fundamental problems this format presents. At the level of economic theory, all the various AB formats introduced at the local level share the national criterion's characteristic of generating an equilibrium in which all firms offer a 0% discount. These changes, therefore, are unable to modify the fundamental inefficiency implied by the national system, *i.e.* it has become a sort of lottery, in which offers are disjointed from real production costs and it is a system that is highly vulnerable to risks of collusion. In view of these considerations, it seems reasonable to explain these changes as a tool for closing the market to enterprises from other regions, making it more difficult for them to adapt to an adjudication mechanism that differs from the national standard. In contrast, the reform in Turin in 2003 which forbade the AB in favour of the FP auction is an example of a virtuous local reform that improves over the national regulation. This is especially true because in Turin it was understood that a *naïve* substitution of AB with FP auctions was doomed to fail if implemented without a strengthening of the conditions guaranteeing bid reliability. In the case of Turin, this was achieved through an increase in the *ex post* bid screening in FP auctions.

As regards the reform of the entry criteria, though some of the reforms carried out at the local level may be useful to identify selective parameters for firms adhering to the specificities of the local territory (stricter measures against criminal infiltration, for example), most of the reforms illustrated in the previous section do not seem to be motivated by such aims, but rather by the attempt to reduce competition in favour of local firms. In particular, both the introduction of re-

gional registers (for example in Valle d'Aosta), and of the requirement for a connection with the territory (like the obligation of having an office in the region which was imposed by Friuli Venezia Giulia), do not guarantee greater reliability on the part of firms, but merely reduce potential competition.

In general, this translates into worse performance by the selection mechanisms for private contractors, in terms of higher costs for the contracting authority (and hence a possible waste of resources), due to the fact that the firm with the lowest cost will not be the one that is awarded the contract. Thus, favouring local firms tends to damage the community³⁴. This is clearly evident if one considers the combined effect of these additional entry criteria and of the auction format used. Since the use of the AB auction already kept default risk at bay, the additional entry criteria were very unlikely needed to further reduce this risk and, instead, served for favouritism reasons.

4. - Empirical Analysis

This econometric analysis uses a previously constructed data set³⁵ containing information on approximately 150,000 contracts awarded by all Italian administrations between 2000 and early 2008 and reported to the Authority for the Supervision of Public Contracts³⁶ (AVCP from now on). Considering that this analysis addresses exclusively execution only contracts (not management contracts) for works assigned to external contractors and that the AVCP data is incomplete in parts, the present work only makes use of information about approximately 60,000 contracts awarded by local administrations.

This examination concentrates on three basic aspects concerning the performance of the adjudication process: *i*) the winning discount; *ii*) the number of offers

³⁴ However, due to the existence of residual contexts, where the damage created by the reduction of potential competition is limited or non-existent, only empirical analysis can establish whether the damage ensuing from these rules exists and how widespread it may be. For some preliminary answers on this subject, see the next paragraph.

³⁵ A detailed description of the data set is available in DECAROLIS F. (2009).

³⁶ The AVCP is the Italian Authority for the Supervision of Public Contracts for Works, Services and Supplies. Until today reports to the AVCP have been required for contracts over €150,000. On the basis of the data available for the first time in 2011, it is estimated that works worth over €150,000 account for 50% of all contracts awarded in terms of number and 94% in terms of value. These estimates obviously do not include military and civil contracts covered by secrecy rules.

received; *iii*) the probability that the winning firm is registered with one of the boards of trade in the contracting authority's region ("local winner"). For each of the Regions interested by one of the local reforms described early Table 4 shows the subdivision of contracts awarded between 2000 and 2008 according to the four auction formats: FP, AB, SR and N. For each region and each format the table indicates the mean value of the winning discount, the mean value of the number of offers, the probability of a local winner, and the number of tenders.

TABLE 4

DESCRIPTIVE STATISTICS BY AUCTION FORMATS

Dependent Variables:	Regions:	Auction formats			
		FP	AB	SR	N
Winning bid (mean)	Friuli	22.41	6.75	12.52	5.61
Number of bids (mean)	Venezia Giulia	10.58	14.16	8.24	5.65
Probability of local winner		0.08	0.66	0.71	0.85
Number of auctions		8	585	5	1,090
Winning bid (mean)	Sardinia	20.84	14.27	14.52	9.92
Number of bids (mean)		13.53	15.99	11.84	5.51
Probability of local winner		0.48	0.72	0.61	0.63
Number of auctions		59	3,693	75	184
Winning bid (mean)	Sicily	14	12.83	1.27	9.39
Number of bids (mean)		48.07	79.74	109.2	11.69
Probability of local winner		0.65	0.81	0.67	0.79
Number of auctions		214	5,828	53	401
Winning bid (mean)	Piedmont	29.4	14.95	14.2	12.18
Number of bids (mean)		11.62	29.64	18.28	5.96
Probability of local winner		0.73	0.65	0.5	0.75
Number of auctions		659	6,888	139	520
Winning bid (mean)	Valle d'Aosta	18.33	15.11	16.23	12.99
Number of bids (mean)		8.12	36.73	24.61	5.76
Probability of local winner		0.18	0.55	0.5	0.79
Number of auctions		2	873	28	258
Winning bid (mean)	Veneto	11.95	11	11.49	9.89
Number of bids (mean)		23.5	37.18	19.95	6.59
Probability of local winner		0.64	0.73	0.75	0.89
Number of auctions		201	5,711	98	1,706

Table 4 reveals several interesting facts. First of all there is an absolute preponderance of AB auctions over all the other formats. We also notice a considerable heterogeneity in the different regions in the use of the remaining three

formats. Secondly, in AB auctions we witness a lower discount in comparison to FP auctions, though the AB auctions receive a higher number of bids. The probability of having a local winner is markedly higher in the N format, even if in some Regions SRs present even higher values. While these results suggest significantly different performances in the contract award systems of the various regions because of the differences in local regulations and in line with the theoretical predictions of the previous paragraph, the detection of a causal relationship between the reforms under analysis and the performance measures has to, in any case, overcome the usual difficulties in estimating *causal effects*.

The following analysis exploits the local reforms discussed earlier to assess their effects on auction outcomes. Unfortunately, due to gaps in the available data and to the overlapping of several reforms in the same region at the same time, it has not been possible to analyse all the local reforms.

4.1 Qualification Requirements

Several local reforms among those described in Section 3 seem to be aimed at closing the local market to competition from external firms. The aim of this section is to empirically quantify the effectiveness of these rules in reducing the number of total bidders and in increasing the probability of a local contractor winning. Though the AVCP data does not allow us to know the geographical origin of all participants, they do allow this type of analysis for the winning firm. Table 5 below shows the results of a comparative analysis of the probability that an auction will have a local winner. The AB auctions are divided into two groups: those which took place before the reform under analysis and those which took place after it. The table illustrates how, for all three reforms, the change in the fraction of local winners takes place as expected: it decreases in Sardinia and Valle d'Aosta and increases in Friuli. However, only in the case of Sardinia do we find a statistically significant difference. This is a significant result, insofar as the geographical structure of Sardinia already makes the region a market with stricter barriers for external firms. In any case, the analysis shows that as well as the natural barriers, regulatory limitations could have played a role in Sardinia's closure to competition from non-local firms.

TABLE 5

EFFECT OF THE MARKET OPENING/CLOSING REFORMS ON THE PROBABILITY OF THE WINNER BEING LOCAL

Dependent Variable:	Opening		Closing
	Sardinia	Valle d'Aosta	Friuli
Dummy for Local Winner	AB	AB	AB
<i>Pre-reform average</i>	0.72	0.67	0.76
<i>Post-reform average</i>	0.66	0.57	0.81
Difference	-0.06***	-0.10	0.05
No. Observations	1,811	1,369	1,848

Level of significance of the t-test for the differences in the averages: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Although suggestive of the presence of an effect of these local reforms, the comparisons in Table 5 might differ from the causal effect of the reforms. To investigate this issue further, we looked at the effect on participation of what took place in Valle d'Aosta and in Friuli, using a *difference-in-differences* methodology. In Valle d'Aosta, in December 2006, there was a period of opening up to the market with the special restricted procedure introduced by the region the year before it was declared unconstitutional. By contrast, in Friuli in November 2006 we witnessed a period of closure towards the market, with the introduction of a required minimum number of employees registered with the INPS Pensions Institute in the Friuli Region as a requirement for firms to participate in restricted procedure auctions. To carry out the *difference-in-differences* analysis we compare the outcomes in the auctions in Valle d'Aosta to those in the auctions of the neighbouring Piedmont region. Similarly, for the auctions in Friuli, our control group consists of the auctions held in the neighbouring Veneto region. Sardinia was excluded because of the difficulty in finding an appropriate control group. We chose time windows which would avoid any conflicts with other potentially relevant reforms.³⁷

The dependent variables considered are the number of bidders, the winning discount and a dummy for the winner being local. The estimates reported in Table 6 indicate that the Friuli reform, a "closing" episode, is associated with a sharp decline in the number of bidders, but the statistical significance of the effect is not robust across different model specifications. A similar comment, but with the difference that the effect is positive on the number of bidders can be made for the reform in Valle d'Aosta, an "opening" episode. Nevertheless, for Valle

³⁷ For Friuli the time span is June 2003-August 2007; for Valle d'Aosta September 2005-September 2008.

d'Aosta this did not lead to savings in terms of awarding prices as, indeed, the winning discount is estimated to decline by about 2 percent.

TABLE 6.1

ESTIMATE OF THE EFFECTS OF THE FRIULI ENTRY CRITERIA CHANGE
(CLOSING)

	Number of Bids		Winning Discount		Local Winner	
	(1)	(2)	(3)	(4)	(5)	(6)
Reform Effect	-18.54** (9.144)	-13.28 (8.670)	-3.045** (1.388)	-1.390 (1.623)	0.144 (0.110)	0.141 (0.218)
No. Obs.	1,794	1,794	1,725	1,725	1,797	1,797
R ²	0.091	0.536	0.183	0.527	0.008	0.306

TABLE 6.2

ESTIMATE OF THE EFFECTS OF THE VALLE D'AOSTA ENTRY CRITERIA
CHANGE (OPENIG)

	Number of Bids		Winning Discount		Local Winner	
	(1)	(2)	(3)	(4)	(5)	(6)
Reform Effect	14.80 (14.80)	17.42*** (5.264)	-2.344* (1.395)	-2.063** (0.984)	-0.006 (0.109)	-0.029 (0.100)
No. Obs.	1,369	1,369	1,322	1,322	1,399	1,399
R ²	0.024	0.490	0.078	0.508	0.006	0.006

Robust standard errors in parenthesis. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Model (1) includes dummy variables for regions and years. Model (2) includes model (1) controls and also dummy variables: for the administration identity, its type (municipality or province), the level of the reserve price and the type of work.

Finally, in terms of whether these reforms increased the share of auctions awarded to local bidders, the signs of the estimates are consistent with the effects we predicted. However, the variability of the estimate does not allow us to identify any statistically significant effect once a series of checks for the type of work and of contracting authority are included in the regression.

4.2 Auction formats: *The Switch from the AB to the FP Auction*

A case of virtuous change of auction formats is that of the Municipality of Turin, which replaced the AB with the FP format in 2003. This choice, shortly afterwards made by the Turin province as well, was explained by the local legislator as necessary due to collusion between firms and to the total incongruity of the bids (always in great numbers) in relation to execution costs.

This reform has been analysed by a few recent studies. Decarolis and Conley (2011), analyses the behaviour of firms in AB auctions and develops two statistical tests aimed at identifying respectively the coordination in the offers and in the participation of colluding enterprises. These tests manage to replicate almost perfectly the structure of the Turin area cartels as identified by the Turin Tribunal in 2008 – which led to convictions on bid rigging charges of several firms active in the procurement sector through 8 cartels between 1998 and 2003.³⁸ The study illustrates how, paradoxically, the presence of several cartels is the only possible form of competition in AB auctions and thus reveals that, though the activity of the cartels is an offence, it also allows general government entities to substantially improve the contract price.

Although this result clearly illustrates the problems connected to the AB format, the presence of both default and corruption risks explains why the abandonment of the AB auction in favour of FP auctions is not necessarily positive, unless it is accompanied by measures aimed at reducing these two risks. If we analyse the effects both of the Turin reform and of the national reform adopted with the 2006 PPC, which made the automatic exclusion in cases of abnormal tenders for public contracts under the EU threshold optional and no longer compulsory,³⁹ we find that the shift from AB auctions to FP is associated with a substantial increase in winning discounts, but also with an increase in renegotiations. In particular, Decarolis (2013) estimates that the switch from AB to FP auctions in Turin caused an increase of the winning discount between 8 and 12 percent of the value of the reserve price. At the same time, the higher discounts in the adjudication phase are partly balanced by an increase in the final price paid. In particular, it can be estimated that the passage from automatic exclusion for abnormal tenders to first price auctions involves an increase of the renegotiated quota of the contract equal to approximately 6% of its value. Therefore, the total effect on execution costs can be obtained by subtracting the increase of the renegotiated quota from the increased discount and, ideally, adding the costs for screening tenders for their reliability.⁴⁰

³⁸ See Trib. Torino, Prima Sezione Penale, 28 April 2008.

³⁹ See DECAROLIS F. (2009).

⁴⁰ From a more general point of view, the analysis of the total cost for general government entities should also take into account two costs the data does not reveal: *i*) transition costs associated to renegotiation and *ii*) the costs of carrying out the auction procedure. Furthermore, the time frame of costs itself is not necessarily irrelevant. For example, an entity with financial difficulties or one whose directors are about to leave office, may be inclined to benefit from the immediate savings produced by FP, knowing that an increase will only take place in renegotiation in a successive phase.

The increase in renegotiations proves the limits of the FP format, which is extremely vulnerable to the risk of failure to complete the work. These shortcomings, together with the expenses for bid screening, are probably the reason behind the new assessments made by Turin Province which, as already mentioned, decided in 2010 to revert to the automatic exclusion criterion for abnormal tenders for works worth €500,000 or less and with a maximum of ten tenders allowed.⁴¹ Indeed, the data clearly shows how verifying congruity generates costs for the administration: with FP the adjudication process takes approximately 50 days longer than with AB auctions; in addition, in approximately 15% of cases, at least one offer is excluded, and this nearly always generates a further dispute.⁴²

4.3 Auction Formats: The Switch from the National to the Local AB Auction

While for some administrations, given the current system, abandoning the AB auction without the appropriate precautions may not be optimal, it is reasonable to argue that there are no valid economic justifications for the various regional reforms aimed at keeping the AB format while modifying certain aspects of it. Many of these reforms, listed in Table 2, are difficult to understand from the point of view of improving the efficiency of the award system.

Particularly significant is the case of the reform in Sicily in 2005. The changes are only apparently a matter of detail: the lowest discount (or that equal to the abnormality threshold) wins, not the discount strictly below this threshold. From a theoretical point of view this radically changes the possible equilibria of the auction, allowing the presence of multiple equilibria where all firms offer the same identical discount, which has nothing to do with their costs. To evaluate this concern, we obtained a random sample of all the bids submitted in 131 AB auctions for roadwork contracts (*i.e.* work type: OG3) awarded in Sicily between 2005 and 2010. Strikingly, we find that more than half of all auctions are awarded at a discount of exactly 7.3%. The histogram on the right reports on the horizontal axis the number of bids submitted in each of the 131 auctions. This is consistent with what the firms had explained to us: the AB reform in Sicily increased the

⁴¹ Also reserving the right to employ other procedures, if justified by the particular characteristics of a project.

⁴² Again, in view of these considerations, we should not look unfavourably at the Regional Laws applied by several Regions in the South (Campania, Puglia, Calabria and Sicily), which, after the entry into force of the Public Procurement Code, prohibited the application of FP in favour of AB, thus guaranteeing that an inefficient process for assessing bids (mainly because of high corruption risks, not only because of technical inefficiencies) failed to produce significant damage on the award system.

randomness of the allocations even further, transforming the AB auctions in lotteries awarded at a fixed discount of 7.3 percent. Interestingly, an extremely high number of bids is submitted in these auctions: the average is around 100 and auctions with even more than 400 bidders are frequent. The Sicilian case is emblematic of this since the very large number of identical discounts often leads to the use of a lottery to award to one of the various firms with the same winning discount. In our sample of 131 auctions, as many as 76 auctions required a draw between firms to assign the project.

In a region like Sicily where, as we have seen, the regional legislator was particularly concerned about attempting to limit corruption risks, a random lottery undoubtedly has its advantages as a mechanism that can be made difficult to manipulate (for example, with a computerized draw process) and one which makes it easy for corruptive phenomena to be identified (for example, via statistical tests to identify the firms that tend to win more frequently compared to the frequency that non-fixed draws should allow). However, this mechanism inevitably implies an enormous waste of resources – an early survey of auctions held after the scrapping of automatic exclusion of abnormal tenders after 2010 reveals increases in the winning discounts that are on average 20 per cent of the value of the contract – without considering that, as already stressed, it is not advisable to combat corruption risks using the auction format itself as a weapon.

Therefore, for regions like Valle d'Aosta and Friuli where corruption is likely less relevant than Sicily any reform of the AB auction should have consisted in its abandonment, as Turin did. Instead, the reforms undertaken by Valle d'Aosta in 2005 or by Friuli in 2002 to slightly modify the AB rule do not solve the problems of the national AB format. In line with this prediction, Table 7.1 and 7.2 shows the results of *difference-in-differences* estimates of the effects these two reforms had on the number of bidders, the winning discount and the dummy for local winner.⁴³

Results point out how in Friuli changes to AB increased the share of contracts awarded to local firms. There is also weak evidence that the winning discount worsened as a consequence of this reform. An effect on the winning discount that

⁴³ More specifically, for Friuli the control group was constructed using comparable contracts awarded in Veneto, while for Valle d'Aosta the same procedure was used taking Piedmont as the control group. For the analysis of Friuli, auctions that took place between August 2001 and June 2003 were used, so as to isolate only the effect of the change in definition criteria for abnormal offers which came into effect in 2002. For the same reason, the analogous reform in Valle d'Aosta, which became effective in September 2005, uses auctions announced between September 2002 and December 2006.

is strongly significant and large in magnitude is found for the Valle d'Aosta reform where the winning discount declines by about 6.5 percent. Therefore, the new award criterion in Valle d'Aosta, even more unpredictable than the national criterion, because of the random extraction of a value included in calculating the abnormality threshold, seems to have increased expenses for the contracting authorities in that Region.

TABLE 7.1

ESTIMATE OF THE EFFECTS OF THE FRIULI AB RULE CHANGE

	Number of Bids		Winning Discount		Local Winner	
	(1)	(2)	(3)	(4)	(5)	(6)
Reform Effect	-2.867 (2.660)	-1.675 (2.495)	-1.714** (0.734)	-0.909 (0.766)	0.186*** (0.061)	0.134** (0.055)
No. Obs.	1,561	1,561	1,430	1,430	1,564	1,564
R ²	0.058	0.545	0.059	0.467	0.013	0.345

TABLE 7.2

ESTIMATE OF THE EFFECTS OF THE VALLE D'AOSTA AB RULE CHANGE

	Number of Bids		Winning Discount		Local Winner	
	(1)	(2)	(3)	(4)	(5)	(6)
Reform Effect	1.371 (10.737)	3.230 (3.378)	-6.562*** (0.970)	-6.482*** (0.693)	-0.026 (0.092)	-0.036 (0.057)
No. Obs.	4,112	4,112	3,882	3,882	4,146	4,146
R ²	0.072	0.472	0.072	0.494	0.003	0.268

Robust standard errors in parenthesis. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Model (1) includes dummy variables for regions and years. Model (2) includes model (1) controls and also dummy variables: for the administration identity, its type (municipality or province), the level of the reserve price and the type of work.

5. - Some Policy Implications

A decentralized public procurement system in which local administrations draft salient parts of the regulation creates a *trade-off* between the ability of the system to respond to the specific needs of the territory and its capacity to produce benefit, at the aggregate level in terms of reductions in public expenditure and an effective allocation of resources. Local regulation may help the contracting au-

thorities to respond better to the structural factors of their own geographical area, for instance, a particularly severe risk of corruption. From the opposite point of view, however, local regulations can have heavily distorting effects on competition in the award of public contracts and hence come to increase the costs for contracting authorities and cause inefficiencies.

In the case of Italy, the local reforms that we described in the previous section appeared, with the exception of that of Turin, either ineffective or perverse. Their provisions entail a reduction in competition, in the form of both explicit forms of favouritism towards local firms and higher participation costs for external firms, which find themselves having to employ additional resources to adapt to the local regulations in question. Therefore, the first and most general implication of this study is to suggest a greater coordination of reforms between the central and local levels. Improvements could be achieved by the strengthening of the channels between the state, region and local authorities both in the process of rule-making and in that of *ex post* evaluation of the regulations. Furthermore, it would be desirable to create *ad hoc* technical structures within the AVCP with tasks of analysis and study of the reforms at the local level for the award of public works contracts, with the aim – on the one hand – to derive information about the specific characteristics of the area to which they relate.

A second set of policy implications regards the specific regulations that we analysed. It is clear that restraints to entry like those based on the geographical location of firms are a threat to the efficient allocation of contracts and should be eliminated. The implication regarding how to reform the AB auction is more nuanced. Ideally, because of the large inefficiencies that this format produces this mechanism, as well as any other auction with an automatic exclusion mechanism for low prices should be barred. In practice, however, this reform is advisable only if it could be accompanied by the introduction of stronger measures against breach of contract by the eventual awardee. In particular, for the case of Italy it may be useful to favor centralization in assessing anomalies and putting specialized technical bodies in charge⁴⁴ (following the model of the central purchasing agen-

⁴⁴ Under the regulations, the responsibility for assessing anomalies can be assigned to either an auction commission (where established) or to the technical organs of the adjudicating authority *i.e.* to the special commission pursuant to Article 88(1)(b) of the Public Procurement Code, preferably made up of personnel from the administration, with the possibility, however, of naming outside experts in the case of justified technical deficiencies and/or lack of resources. But these solutions appear unworkable for small authorities, which would find it hard to ensure satisfactory assessment of the congruity of bids with acceptable costs.

cies).⁴⁵ This could reduce the corruption risk of lowest-price adjudications and also contain the costs sustained by the single adjudicating authorities, which mainly reflect the checking of abnormalities.⁴⁶ Moreover, it would be appropriate to strengthen the system of guarantees, increasing the surety amount and to extend gradually the use of performance bonds, as done in the US.

A third set of conclusions regards green and innovation procurement. These new areas of procurement that have recently received substantial attention both at national and European levels will need regulations that carefully account for the problems documented in this essay. As regards green procurement, this activity seems particularly prone to manipulations on the side of local authorities. The tendency of local administrations to foreclose the market could be exacerbated by a regulation of green procurement that gives new margins to administrations to discriminate across firms. This is particularly salient because, given the tendency of administrations to favor local firms, green public procurement might be exploited as a justification for why the contract has to be awarded to firms located close to the location of the work. It is clearly extremely hard to evaluate the relative merits of having a contractor that is local, and so, for instance, produces fewer emissions to move its machineries to the location of the work, and a far away contractor that uses a greener production technology than the local contractor. This difficulty could be used strategically by administrations to promote favoritism. Therefore, clear and transparent national rules are greatly needed in this area.

The argument about risks for the procurement of innovation, instead, is based on the high regulatory fragmentation that this study revealed. Innovation procurement is an area in which due to the non-standardized nature of the good, compe-

⁴⁵ The purchasing centre is an adjudicating administration that can directly purchase supplies and services assigned to other adjudicating authorities or proceed to award contracts or conclude framework agreements for projects, supplies or services in favour of those other administrations (Articles 3(34) and 33 of the Public Procurement Code). From this point of view, the measures enacted by Law 136/2010 (Special Anti-Mafia Plan and Delegation to the Government for Anti-Mafia Provisions) are of special interest. To rationalize and improve the quality of structures, the law provides for the institution, at a regional level, of one or more adjudication authorities to guarantee transparency, regularity and fair costs in the management of public contracts and to prevent the risk of mafia infiltration. The implementing procedures are defined in a presidential decree. These authorities could play a significant role in the assessment of abnormal offers. See DECAROLIS F., GIORGIANTONIO C. and GIOVANNIELLO V. (2010).

⁴⁶ See DECAROLIS F. (2009).

tion is necessarily less fierce than for the procurement of standardized public works, like roadway repairs. Therefore, the barriers to competition posed by the substantial degree of fragmentation of the regulation could be an insurmountable obstacle for innovation procurement. It is discouraging to observe how distorted and inefficient the procurement of simple public works appears to be in Italy. It is therefore essential that maximum attention is given to fixing the procurement system of the most traditional type of contracts. Otherwise, it seems only hopeless that innovation procurement can effectively work in a country like Italy.

6. - Conclusions

This paper has presented an analysis of how the fine details of the regulations governing the entry criteria and the award rules can significantly impact the functioning of a procurement system. Drawing from the case of a series of local reforms that took place recently in Italy, we have shown how even rigid and transparent institutions can be distorted to favour local contractors, thus creating inefficiencies.

The analysis presented is a cautionary tale against the risks of decentralizing the design of important aspects of the procurement regulations. The lessons learned for green and innovation procurement are twofold. On the one hand, the propensity of local administration to restrict the entry into auctions suggests that the green requirements might be used in a distortive manner to perpetrate favouritism. On the other hand, the excessive fragmentation of the Italian procurement regulation reveals the presence of severe barriers to competition that, for such a sophisticated type of procurement as the procurement of innovation, are likely to be a formidable obstacle to its proper functioning.

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Public Procurement and Corruption in Africa: A Literature Review

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Corruption is the major scourge of governments in Africa. This paper answers three questions: what types of corruption are found more often within public procurement in Africa? What are the major determinants of corruption in public procurement and what are the major challenges for the fight against corruption in public procurement in Africa? This paper examines the determinants of public procurement corruption in Africa, and finds that the economic, political, organizational and social determinants have a significant relationship with public procurement corruption in Africa, and proposes some challenges to consider in the fight against corruption in public procurement.

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1. - Introduction

Corruption in public procurement, which is a global phenomenon affecting countries at all stages of development, has tremendously negative effects, leading to projects which not only exploit taxpayers' money or donated funds, but which may also pose a danger to the health and safety of users. Public procurement is particularly susceptible to corruption because of the vast sums of money governments spend on such projects, the relatively high degree of discretion public officials and politicians typically have in such matters in comparison with other areas of public expenditure, and the difficulty in detecting and investigating cases of corruption.

Specific examples of corruption in public procurement may be as varied as the procurements and individuals involved. Generally, corruption in public procurement may involve complicated procedures and detailed planning; technical complexities; numerous persons; and at times an international dimension. These characteristics should be duly considered in detecting, preventing and deterring corruption in public procurement.

Because of the complexities of corruption in public procurement, comprehensive preventive measures are necessary. Clear regulations and transparent procedures in public procurement, including e-procurement, establishment of procurement boards, education and public awareness of corruption in public procurement are examples of effective preventive measures. Despite these measures, corruption in public procurement still persists.

2. - Methodology

The review of the literature reveals that many papers have been written to try to understand the phenomenon in several countries in Africa and the world. The results of this research show that the forms and determinants of corruption depend on each country. From a globalization view, the objective of this study is to try to identify forms and determinants of corruption that are common to African countries, in order to further identify the major challenges to combat this scourge. The inductive method will be used through an empirical research introducing generalizations estimating population parameters from observation, and draining sample and devising measuring instruments. (Empirical generalization). The deductive method will be used through the theorizing, forming concepts developing and arranging propositions from theories, and deducting consequences making predictions.

In data collection and analysis, this study will use two ways of triangulation with the purpose of arriving at as multifaceted a treatment as possible: firstly the source data triangulation investigating scholarly literature and statistical material (previous studies, reports, statements); and secondly the methodological triangulation using different methods: systems approaches, modeling, discussions, analysis of documents and earlier research. Briefly, the research will combine qualitative and quantitative approaches.

3. - Literature Framework

Public procurement is defined by the World Bank as the purchasing, hiring or obtaining by any other contractual means of goods, construction works and services by the public sector. It is alternatively defined as the purchase of commodities and contracting of construction works and services if such acquisition is effected by resources from state budgets, local authority budgets, state foundation funds, domestic loans or foreign loans guaranteed by the state, and foreign aid as well as revenue received from the economic activity of the state. Public procurement thus means procurement by a procuring entity using public funds (World Bank, 1995).

Public procurement has been identified as the government activity most vulnerable to corruption. As a major interface between the public and private sectors, public procurement provides multiple opportunities for both public and private actors to divert public funds for private gain.

Traditionally, public procurement has been perceived as belonging to the implementation phase of the budgetary process. In other words, public procurement professionals are responsible for executing the approved procurement budget. This is a very narrow view of the role of these individuals. In reality, for certain procurement types, particularly building and road construction projects, public procurement professionals can be valuable sources of information for sound decisions. For a better procurement plan, they need to know in advance, *i.e.* before the procurement budget is approved: (1) How many procurement projects will be conducted in the fiscal year? (2) How many procurement projects' budgets have to be spent in the fiscal year and will expire by the end of the fiscal year if they are not spent? and (3) What projects are most critical for the agency's mission so that extra attention can be given to them?

Moreover, market knowledge on the part of public procurement officials will be critical to decisions on such alternatives as privatization or "make-or-buy". Finally,

knowing how a procurement project is planned, authorized, and budgeted, public procurement professionals will be able to implement procurement projects effectively, efficiently, and economically. In reality, procurement officials are involved in procurement only after agencies have obtained a procurement budget. The procurement process consists of many stages, as argued by Thai (2009): (a) procurement planning; (b) preparing and processing of procurement requests; (c) developing and reviewing requirements documents; (d) planning for evaluation; (e) contract award; (f) preparation and signing of contract; and (g) contract administration.

Weele (2005) adopts another approach, which specifies six distinct activities: specification, supplier selection, contracting, ordering, expediting, and follow-up/evaluation. This combination of precision and a broad-brush approach makes this six stage approach effective as a framing device for mapping out the contingent approaches of the many forms of public procurement. Government procurement is not only business, *i.e.* the acquisition of goods and services on the best possible terms, but also has broader social, political and economic implications. Throughout history, governments have used their procurement power to promote social, industrial and environmental policies.

Although public procurement processes are fairly complex and can be implemented differently in various jurisdictions, their three main phases are: (1) Procurement planning and budgeting; (2) Procurement solicitation; and (3) Contract award and performance. Corruption can arise in various forms in each of these separate phases of the procurement process.

In the first phase, the government entity needs to determine what good or service it would like to buy (the requirement) and how much it would like to spend (the budget). (See Dyer and Singh, 1998; Sako, 1992). In both of these cases, there are opportunities for corruption. In determining the requirement, reports could be prepared that falsely report damaged equipment in order to create an excess supply that could be used for corrupt purposes. The procurement requirements could also be written to favor a particular supplier or contractor. Budgets could be set artificially high so that excess allocations can be stolen or diverted. In addition, programmatic budgets could be devised in such a way that there are overlapping budgetary allocations among separate organizations or departments that could likewise be applied in a corrupt manner (see Brousseau and Glachant, 2005; Lamming, 1993).

In the second phase, the main tasks are compiling the request for proposals or tender documents and conducting an evaluation. The evaluation criteria in the request for proposals or tender documents could be drafted to favor a particular

supplier or service provider, or likewise could be drafted to emphasize the weaknesses of a particular competitor. The criteria could also be drafted in a subjective way or even not clearly stated in the tender documents, leaving room for manipulation and biased assessments and having no grounds for justifying the decision. Later, during the evaluation of the proposals or tenders, these criteria could be misapplied or otherwise further defined or amended after the proposal or tender receipt. During this phase it is also possible that advance information could be provided to a particular, favored supplier or contractor. Other techniques such as failing to solicit proposals or tenders from the competitors of a favored supplier, wrongfully restricting the tender pool, soliciting offerors known to be inferior to a favored supplier, simply mis-addressing tender documents, accepting late proposals or rejecting legitimate proposals can all be utilized to corrupt the procurement process (see Cadwell and Bakker, 2005; Pingry, 1974; Robinson *et al.*, 1967; Strauss, 1962).

Corruption opportunities also abound at the third phase of the procurement process. For example, an offeror could propose an unrealistically low offer in the hope that after the contract is awarded procurement officials will allow amendments to increase costs. Likewise, a firm could offer exceptionally high caliber products or less qualified personnel to meet a particular requirement and then, upon contract award, substitute inferior products or personnel. It is also possible to corruptly require sub-contractual relationships with favored suppliers. Furthermore, after the evaluation is complete, it is possible to award a contract that materially differs from the terms of the original solicitation in terms of specifications, quantity, or delivery schedule. Oversight and reporting requirements may also be minimized and in some cases cost overruns can be corruptly explained away or falsely justified. Finally, supporting documentation could be intentionally lost or destroyed making detection and prosecution of corruption offenses difficult.

But how does it happen in public procurement in Africa? What are the relevant forms of corruption in public procurement in Africa?

During the early years of independence in Africa, the argument presented above was a very popular justification for high levels of corruption in the continent. As the argument went, the new African countries paid their public workers extremely low wages; unfortunately, these workers were expected to financially support not only themselves and the nuclear family but also to share the benefits of their public offices with their extended family, which in some cases could include a whole village. At this time, the argument was that unless the civil servant was permitted to supplement his income with bribes and thus enhance his ability

to meet his various obligations, he was unlikely to remain in the public sector and continue to serve the people (Mukum Mbaku, 2007).

In many countries in Africa today, civil servants continue to thwart poverty alleviation efforts by engaging in activities that enrich them but prevent the private sector from creating the wealth that could be used to deal with pervasive poverty. The public policies favored by bureaucracy are not those that enhance or promote economic growth and the creation of wealth but those that allow civil servants to generate extra-legal income and privileges for themselves. As a result, scarce foreign exchange, which ought to be reserved for the purchase of essential inputs for domestic industries, has been spent on the importation of luxury items from western industrial countries, thanks to corrupt civil servants.

Shortly after independence, many African civil servants saw corruption as an opportunity for self-enrichment. Today, corruption is still viewed by many of them in the same manner (such as in the Democratic Republic of Congo). The argument that corruption can improve the relationship between the private sector and government regulators and thereby produce more growth-enhancing public policies is not informed by the evidence from the continent.

Although there is much evidence to support this conclusion, just one from Cameroon will suffice. In the jargon used by civil servants in Cameroon, the state is generally referred to as the “warehouse” from which they can requisition resources for themselves, their families, and friends. The managers of this warehouse – politicians and civil servants – continue to exhibit an insatiable appetite to defraud the warehouse’s owners, *i.e.* the Cameroon people. The process works as follows: an office needs reams of paper. Thus, they are ordered. An agreement is made to pay 8 million or 10 million CFAF for paper that should cost 5 million CFAF. How is the 3 million or 5 million CFAF surplus shared? It is shared between the boss (the linchpin), the store’s accountant (the controller) and the businessman (the architect) (quoted in Jua, 1991, page 165; see Agbiboa, 2012). The same practice is observed in many other African countries, such as the Democratic Republic of Congo and Burundi, Nigeria, Kenya, South Africa, Morocco, Tunisia, Algeria, etc. (See Adebayo, 2010).

In the 1960s, development economists also argued that corruption in the poor countries could «help economic development by making possible a higher rate of investment than would otherwise be the case» (see Leff, 1964, page 10).

As argued by Bayley (1966, page 728), corruption, whether in the form of kickbacks or payments originating with the briber, may result in increased allocation of resources away from consumption and into investment. In Bayley’s view, bu-

reaucrats, who belong to a group that is relatively more educated and has higher skills than the rest of each country's citizens, have more information about investment and economic growth than the ordinary citizen. Hence, members of this group may have a higher propensity to invest in productive activities than the individuals who pay bribes to them. Transferring resources from the rest of the population through corruption to members of the civil services, as argued by Bayley, can actually raise levels of investment in those activities that create wealth.

It is argued by several development economists (*e.g.* Leff, 1964), that corruption can help entrepreneurs and investors (both foreign and domestic) to have more control over the policy process and government activities in the economy, resulting in a significant reduction in the negative effect of political uncertainty on investment and productive activities. Leff argues that by enabling entrepreneurs to control and render predictable this important influence on their environment, corruption can increase the rate of investment.

It is also argued that corruption can improve the environment for domestic innovation and lead to higher levels of economic growth. Traditionally, the entrepreneur who engages in innovation or the creation of knowledge (*i.e.* technology), faces severe competition from established business interests and may find it very difficult to successfully introduce a new innovation into the market place. With corruption, the creator of new knowledge can secure the protection that he needs to successfully launch the new innovation; graft alone may enable an economic innovator to introduce his innovation before he has time to establish himself politically.

One question comes to mind from this argument: can corruption enhance both innovation and investment in Africa? Or, better yet, has corruption enhanced investment in Africa as argued by Leff (1964)? The answer is certainly negative – as presented in the last part of this paper.

A recent study has characterized some main forms or manifestations of corruption, according to a number of basic characteristics (Amundsen, 1999). The main forms considered are bribery, embezzlement, fraud, extortion and favoritism. Even when these concepts are partly overlapping and at times interchangeable with other concepts, they may identify some basic varieties of corruption.

- a. "*Bribery*" is the payment (in money or kind) that is given or taken in a corrupt relationship. To pay or receive a bribe is corruption *per se*, and should be understood as the essence of corruption. A bribe is a fixed sum, a certain per-

centage of a contract, or any other favor in money or kind, usually paid to a state official who can make contracts on behalf of the state or otherwise distribute benefits to companies or individuals, businessmen and clients.

There are many equivalent terms to bribery, such as kickbacks, gratuities, “commercial arrangements”, baksheesh, sweeteners, pay-offs, speed- and grease money, which are all notions of corruption in terms of the money or favors paid to employees in private enterprises, public officials, and politicians. These are payments or returns needed or demanded to make things pass more swiftly, smoothly or favorably through the state or government bureaucracies (see Ufere *et al.*, 2012).

- b. “*Embezzlement*” is theft of resources by people who are put in place to administer those resources; it is when disloyal employees steal from their employers. This is a serious offence when public officials are misappropriating public resources, when a state official steals from the public institution in which he or she is employed and from resources he or she is supposed to administer on behalf of the public.

Embezzlement is *not* considered as corruption from a strictly legal point of view, but is included in the broader definitions. In legal terms, corruption is a transaction between two individuals, one state agent and one “civilian”, where the state agent goes beyond the limits of the law and regulations in order to secure himself a personal benefit in the form of a bribe. Embezzlement is regarded more as theft because it does not involve the “civilian” side directly. The general public is deprived when public funds are embezzled, but no individual property is stolen and individual citizens are bereft of legal rights to present themselves as forfeited.

This all points to one of the dangers of embezzlement. There will have to be a political will as well as an independent judiciary and a legal capacity to clamp down on embezzlement. It is a form of corruption and power abuse that can develop in closed institutional and moral spheres, independently of the public moral code and with few possibilities of public sanction. In many thoroughly corrupt countries, embezzlement is a fundamental part of the resource extractive capacity of a ruling elite, even more important than extraction through bribes.

- c. “*Fraud*” is an economic crime that involves some kind of trickery, swindle or deceit. Fraud involves a manipulation or distortion of information, facts and expertise, by public officials positioned between politicians and citizens, who

seek to make a private profit. Fraud is when a public official (agent), who is responsible for carrying out the orders or tasks assigned by his superiors (principals), manipulates the flow of information to his private profit; hence the widely used principal-agent or incentive theory employed by economists to study this phenomenon (Eskeland and Thiele, 1999; Fjeldstad, 1999).

Fraud is also a broader legal and popular term that covers more than bribery and embezzlement. It is fraud, for instance, when state agencies and state representatives are engaged in illegal trade networks, counterfeit and racketeering, and when forgery, smuggling and other organized economic crime is propped up by “official” sanctions and/or involvement. It is fraud when politicians and state agents take a share for closing their eyes to economic crimes, and it is serious fraud when they have an active role in it.

- d. “*Extortion*” is money and other resources extracted by the use of coercion, violence or the threats to use force. Blackmailing and extortion are corrupt transactions where money is violently extracted by those who have the power to do it, but where very little is returned to the “clients” (perhaps only some vague promises of exception from further harassment).

“Protection” or “security” money can be extorted in the classical, well-known Mafia style, where organized criminals use insecurity, harassment and intimidation to extort money from individual citizens, private businesses and public officials. Corruption in the form of extortion is usually understood as a form of extraction “from below”, by Mafias and criminals.

Corrupt practices of this kind can, however, also be “from above”, when the state itself is the biggest Mafia of them all.

- e. “*Favoritism*” is a mechanism of power abuse implying “privatization” and a highly biased distribution of state resources, no matter how these resources have been accumulated in the first place. Favoritism is the natural human proclivity to favor friends, family and anybody close and trusted. Favoritism is closely related to corruption insofar as it implies a corrupted (undemocratic, “privatized”) distribution of resources. In other words, this is the other side of the coin where corruption is the accumulation of resources.

Favoritism is the penchant of state officials and politicians, who have access to state resources and the power to decide upon the distribution of these, to give preferential treatment to certain people. Clientelist favoritism is the rather everyday proclivity of most people to favor their own kin (family, clan, tribe,

ethnic, religious or regional group). Favoritism or cronyism is, for instance, to grant an office to a friend or a relative, regardless of merit.

Favoritism is a basic political mechanism in many authoritarian and semi-democratic countries. In most non-democratic systems, the president has, for instance, the constitutional right to appoint all high-ranking positions, a legal or customary right that considerably extends the possibilities for favoritism. It easily adds up to several hundred positions within ministries, the military and security apparatus, in the parastatals and public companies, in the diplomatic corps and in the ruling party.

Nepotism is a special form of favoritism, in which an office holder (ruler) prefers his proper kinfolk and family members (wife, brothers and sisters, children, nephews, cousins, in-laws, etc.). Many unrestricted presidents have tried to secure their (precarious) power position by nominating family members to key political, economic and military/security positions in the state apparatus. Eigen (2002) argues that bribery and extortion have a very high cost to the public at large. First, the investment costs of a specific project, where the contract was obtained by bribery, will escalate, either from the beginning or later, during execution. Bribery at the contracting stage will lead to the absence of competition (and the price-moderation usually associated with competition), or it will defeat competition by price-fixing or collusion. Bribery during execution may manifest itself by implanted cost increases or by a reduction of project scope without a commensurate reduction in the price.

Second, bribery during execution will lead to substandard performance (cheaper materials, leaner cement mix, execution below specifications), reducing the life expectancy of the project, or requiring higher maintenance expenditures.

Third, bribery often results in the selection and execution of projects that are uneconomic or unnecessary, thereby preventing investments or expenditures that economically, ecologically or socially would be much more desirable. A particularly frequent occurrence is that due to the absorption of scarce resources for uneconomic investments, urgent maintenance expenditures are deferred, with the result that buildings, roads, utilities or school buildings deteriorate much faster than they were designed to do. There is a much greater opportunity for bribery and extortion in investment projects than in maintenance activities, creating a strong bias in favor of heavy expenditure investments.

Fourth, by the wastage of scarce resources, bribery thus contributes to the erosion and undermining of development; it replaces competition and market forces

and after a time it will scare away investors (who will shy away from investing their money in a country where the real return on their investment is so uncertain). Even honest contractors and suppliers will build the cost of delay and uncertainty into their price structure.

Public procurement corruption can be classified to include (1) supplier induced corruption as a result of stringent competition for government contracts (source), and (2) public official induced corruption through creating bureaucratic hurdles that would necessitate seeking faster services (source). It may also be (3) politically induced corruption where contractors with political connections receive favors for fear of political persecution. In many less-developed countries, one of the prevalent forms of corruption is called “speed corruption” (Bose, 2004; Marjit *et al.*, 2000). This involves the capacity to harass, delay or withhold decisions handed down by procurement officials unless a bribe is given. In Uganda’s case, officials in the finance and accounts departments may delay or fail to process the payments for providers until a bribe is paid or promised. It may also involve the engineers, in the case of construction projects failing to issue a certificate of completion, or issuing them when the works have not been completed.

The Uganda 3rd Integrity Survey Report (2008), identifies new forms of corruption and prominent among them are “Syndicate corruption” and “Management by Crisis”. The former involves networks of strategically placed public officials who collude to embezzle public funds with impunity. Under the “management by crisis” syndrome public officials deliberately delay planning in time in order to create a crisis and stampede the procurement process. Demand for, and payment of bribes has changed from covert to overt actions. Public officials are openly asking for bribes in exchange for services while the clients are openly paying without complaining. In this survey, it was revealed that in Uganda there is now a shift from the middle age crisis previously 40-45 years to the current 25-30 years. This has been due to peer pressure among members of the younger generation who have succumbed to flamboyant lifestyles provided by the private sector. This has encouraged them to live beyond their means, hence they engage in acts of corruption (Basheka, 2011).

Corruption is such a pervasive and enduring fact in some societies that it has become an important aspect of the cultural norms and practices (Guhan and Paul, 1997; Sandholtz and Koetzle, 2000). Corruption comes from a Latin word *corrumpere* which means to break something and during the action of corruption, the law, legal rule, a moral norm and in the worst situations communities and human personalities, are broken (Farida and Ahmadi-Esfahani, 2006).

Corruption holds twofold meanings, namely: the narrow and broader perspectives. In the former it is used to mean those activities which stand for illegal practices in which citizens or organizations bribe officials in charge for awarding permissions or contracts, or to escape punishment or fines for offenses they committed (Rose-Ackerman, 1999). In the latter it includes achieving several advances through personal networking, paying gratitude money or giving gifts for usual services but in other cases, it is simply viewed as misuse of public office for unofficial gains.

Heidenheimer (1989) categorized corruption into three forms. Firstly, public office-centered corruption is behavior that deviates from the formal duties of a public role due to private regard for pecuniary or status gains. The second is market-centered corruption where a corrupt civil servant regards his/her public office as a separate business and seeks to maximize his/her income. Third is the public-centered corruption where its patterns can be said to exist whenever a power holder who is charged with doing certain things is, by monetary or other rewards not legally provided for, induced to take actions, which favor whoever provides the rewards and thereby does damage to the public interests.

What are the causes of corruption in the public procurement process in Africa? In other words, what are the determinants of the corruption in the public procurement in Africa? The next part of this paper presents some determinants and their consequences on the public governance.

4. - The Major Determinants of Public Procurement Corruption in Africa

Determinants of procurement corruption in developing countries are complex. They can be microeconomics or macroeconomics, internal or external ones. One single factor cannot therefore fully explain the phenomenon using one set of factors such as economic variables. In this study, we examine the contribution of political determinants of procurement corruption.

The literature suggests many variables combine to explain the phenomenon of corruption in general and public procurement in particular. For example, Serra (2006) conducted a sensitivity analysis on the determinants of corruption involving 16 variables. In that study, four variables were economic, five socio-economic, and seven political.

Corruption can arise because bad policies or inefficient institutions are put in place to collect bribes from individuals seeking to get around them. Paldam

(2000) posits that «a skew in income distribution that discriminates against the majority may increase the temptation to make illicit gains». Economies with high human capital have low levels of corruption as found by Ali and Isse (2003). Meanwhile, Knack and Azfahar (2003) found that in certain situations as the population increases, corruption also rises. In a similar work, Tavares *et al.* (2003) report that population negatively affects corruption. On the basis of the existing literature, the more relevant factors determining public procurement corruption in Africa are as follows:

a. Economic factors: Treisman (2007) has argued that economic variables explain corruption less than social-political variables because the former are affected by non-economic structural variables in both the long and short run. In a comparative analysis of the economic and political determinants of procurement corruption in Uganda, Basheka (2011) found that economic factors explained procurement corruption more than the political factors. One explanation of this was argued to be the traditional domination of corruption studies by economists whose economic measures of corruption have been tested over time. But it could also be because, economically, corruption contributes to the unjust distribution of income, discourages investment and distorts economic growth and development. Particularly in the long run, this will affect efficiency in the supply chain activities of many procured goods and services, and at a national level it undermines both free and fair trade. In a study on the control of bureaucratic corruption in Hong Kong, India and Indonesia, Palmier identified three interdependent factors as being important causes of corruption, namely: opportunities (which depend on the extent of involvement of civil servants in the administration or control of lucrative activities), salaries and policing (the probability of detection and punishment) (Palmier, 1985). Using this logic, it is argued that at one extreme, with few opportunities, good salaries and effective policing, corruption will be minimal but at the other extreme, with many opportunities, poor salaries, and weak policing, corruption will be considerable. Corrupt practices are also associated with a set of structural and cultural factors (Rose-Ackerman, 1999) but it is the structural factors that have received the bulk of the attention in empirical work. The environment in which public servants and private actors operate is another cause of corruption (Farida and Ahmadi-Esfahani, 2006) particularly the bureaucratic and inefficient public administration systems in developing countries. Developing countries are characterized by a number of complex,

restrictive regulations coupled with inadequate controls – circumstances that offer a fertile ground for corruption. Gurgur and Shah (forthcoming) and Brunetti and Weder (2003) concluded that the higher the quality of bureaucracy, the lower the probability for corruption to occur.

A comparative assessment of the entire factor loadings on the different components provides useful information on the critical economic determinants of procurement corruption in Africa. From the analysis, it was confirmed that the major economic determinants of public procurement corruption in many African countries are related to: first, low salaries of public servants were found to be among the major variables explaining increasing trends in procurement corruption. With hardships generated by the global economic crisis, public officials were likely to engage in corrupt tendencies to catch up with “inflationary” tendencies. Second, supplier induced bribes were found to be a major determinant of public procurement corruption in Africa. Third, self-interest of public officers was also confirmed to be a significant economic variable that accounted the most for public procurement corruption in Africa. Fourth, levels of income of public officials were found to be another economic variable that was confirmed as a major economic determinant of public procurement corruption in Africa.

b. Organizational factors: The causes of corruption are rooted in the particular political and economic conditions of each country – the complexity of which makes remedial efforts difficult. That is why it is possible to find factors which change sign and/or statistical significance from one study to another based on slightly different empirical specifications (Serra, 2006). This scenario is also brought about by the challenges experienced in corruption measurement. Moral standards differ from society to society and it becomes difficult to select the moral behavior of one society or country and then argue that others are not moral because they are different. Sometimes, the sequence of questions in a survey may substantially affect the respondents, as they tend to answer questions in line with their answers to previous questions. The time spent by respondents to scrutinize each question, scoring the effects and looking at other cognitive issues may all have an effect on the answers (Bertrand and Mullainathan, 2001). Meanwhile, Donchev and Ujhelyi (2007) contend that what is believed by the respondents may not reflect what actually happens as far as corruption is concerned.

The retained items with their factor loadings offer useful insights into the organizational determinants of procurement corruption in Africa. The results

provide a sound basis upon which managerial and policy decisions on addressing procurement corruption can be based. It has emerged that the most important organizational determinants of procurement corruption in Africa are: first, a lack of transparency and accountability systems in the conduct of organizational functions which is a breeding ground for procurement corruption; second, a lack of capacity among technical staff of the different public organizations. This capacity was mainly in regard to procurement planning, writing of specifications, evaluation of bids and contract management; third, a lack of effective supervision within the organizations; fourth, lack of adequate facilities for the procurement staff in organizations had created a conducive environment for procurement corruption.

The above key findings compare well with existing local and international literature on general determinants of corruption. For example, the view has long been held in the literature that corruption can arise because bad policies or inefficient institutions are put in place to collect bribes from individuals seeking to circumnavigate them. In the context of public procurement, bad procurement policies or inefficient systems within an organization are created to ensure that those bidders for government contracts have no choice but to give bribes in order to overcome procurement administrative hurdles.

- c. *Political commitment*: Shleifer *et al.* (1998), have argued that the biggest cause of corruption is undoubtedly the political leadership at the helm of affairs in a country. This observation suggests that political factors play a critical role in increasing corruption as the political leaders preside over a complex set of political structures. An examination of the factor loadings for the three components provides information on the most important political determinants of procurement corruption in Uganda. Based on the factor loadings, these include: first, politicians who rise to elective positions through offering bribes to voters have increased the occurrence of procurement corruption. In an attempt to recover the money spent on the now commercialized politics in the country, the elected leaders at both central and local government levels influence the award of government contracts where they will get direct economic benefits. Second, lack of the freedom of the press in reporting procurement corruption for sensitive procurements involving “classified” expenditures has increased corruption. Third, the opening up of political space in some countries has contributed to increased levels of procurement corruption as most officials hide under the protection of their political parties to evade justice.

In many African countries, most cases of procurement corruption scandals have been championed by those officials with high political connections that perpetuate the process of influencing the award of government tenders through well-orchestrated machinery in collaboration with government technical officials. The above findings are supportive of what other researchers on general issues of corruption have found.

- d. *Social factors*: The lower percentage of female population in work is another determinant of corruption, as indicated by Swamy *et al.* (2001), whose study found that a higher female labor participation led to less corruption. The authors provide four arguments to explain this finding. First, «women may be brought up to be more honest or more risk averse than men, or even feel there is a greater probability of being caught». Second, «women, who are typically more involved in raising children, may find they have to practice honesty in order to teach their children the appropriate values». Third, «women may feel more than men – the physically stronger sex – that laws exist to protect them and therefore be more willing to follow rules». Lastly, «girls may be brought up to have higher levels of self-control than boys which affects their propensity to indulge in criminal behavior».

Various theorists – as well as many popular accounts – attribute countries' different rates of corruption to particular historical and cultural traditions. A surprising range of national cultures, spanning all continents, have been thought conducive to corruption (Treisman, 2007). Meanwhile, Myrdal (1970) observed that in underdeveloped countries «a bribe to a person holding a public position is not clearly differentiated from the “gifts”, tributes, and other burdens sanctioned in traditional, pre-capitalist society or the special obligations attached to a favor given at any social level». This implies that in some societies, what may be regarded as corruption may actually be gift giving in other societies and heavily acceptable to society. However, this may be contrary to the moral expectations of other societies.

Individual motivation to engage in corrupt behavior could be explained by the social learning theory developed within sociology to explain deviant behavior. The theory is based on four interrelated concepts that operate to promote or undermine conformity: differential association, definitions, differential reinforcement and imitation. These concepts are overlapping and also mutually reinforcing. For example, the basic mechanism of the social learning theory works

as follows: behavior is acquired and sustained (1) through adopting definitions favorable to illegal behavior via differential association with one's peers, (2) through imitating such behavior by peers, and (3) through the positive reinforcement provided by rewards for such a behavior (Akers, 1998).

A deeper analysis of the factor loadings reveals that the most critical social determinants of procurement corruption include: first, religious affiliations where officials with protestant affiliations are likely to be more corrupt than other religious affiliations; second, public officials giving in to traditional values are one of the major causes of procurement corruption. The culture of gift giving, for example, is likely to increase the likelihood of public officials engaging in procurement corruption; third, the study found that there is a number of traditional values in our societies which are ingredients for the culture of corruption in public procurement; fourth, the levels of education of officials is a cause of procurement corruption. Those with low qualifications may engage in mild corruption; fifth, the lack of a vibrant and educated society on fundamental rights is a major determinant of procurement corruption in Africa; sixth, societal tolerance for corruption officials is also increasing the trends of corruption in public procurement in Africa (see Ntayi *et al.*, 2013).

Corruption in public procurement, which affects countries across the globe, has enormous negative consequences. It diverts public funds into unnecessary, unsuitable, uneconomic or even dangerous projects. The expenditure involved in public procurement, the high degree of discretion afforded to public officials in executing such programmes, and the involvement of many private sector entities in the process all contribute to its susceptibility to corruption.

The United Nations has endeavored to promote the eradication of corruption in all its forms and one of its most significant achievements in this regard is the United Nations Convention Against Corruption (UNCAC). African countries must take into account some challenges in this fight against corruption processes.

5. - Recommendations for the Fight against Corruption in Public Procurement in Africa

In its Resolution 58/4 of 31 October 2003, the General Assembly adopted the UNCAC, and the Convention came into force on 14 December 2005. It offers a comprehensive set of measures that can be taken by Member States, international organizations, the private sector, as well as the United Nations. It has

detailed provisions on: preventive measures; criminalization and law enforcement; international cooperation; asset recovery; technical assistance and information exchange and also mechanisms for its implementation.

One of the most important provisions of UNCAC on public procurement is its Article 9 entitled “Public procurement and management of public finances”. This Article requires states to «take necessary steps to establish appropriate systems of procurement, based on transparency, competition and objective criteria in decision-making, that are effective, *inter alia*, in preventing corruption». The systems should address various issues, including: the public distribution of information relating to procurement procedures and contracts; the establishment of conditions for participation; the use of objective and predetermined criteria for public procurement decisions; an effective system of domestic review, including an effective system of appeal; and measures to regulate matters regarding personnel responsible for procurement.

These measures represent the most basic elements which should be adopted to prevent corruption in public procurement. However, in order to make them truly effective and workable, a set of much more detailed regulations is needed, be it law, ordinance, recommendations, or codes of conduct. Many organizations, including United Nations Office on Drugs and Crime (UNODC), have prepared publications containing model laws or provisions, codes of conduct or other suggestions.

Effective sanctions, including penal sanctions, constitute strong incentives both for public officials and employees of the private sector to refrain from corrupt activities. Corruption should be made a high risk crime. In order to achieve an effective criminal sanction regime, states should be equipped with a comprehensive set of offences in their laws to capture various aspects of corrupt activities (criminalization), as well as measures to control the illicit proceeds of such activities. In addition, law enforcement officials and prosecutors should have at their disposal various investigative “weapons” to detect and investigate corruption offences, which also include international cooperation in criminal matters.

The literature recognizes that in Africa the public procurement frameworks have made important progress in developing safeguards against corruption in public procurement. Some countries (such as Rwanda, Uganda, Kenya, Gabon, Tanzania, etc.) have recently enacted regulatory frameworks to curb corruption. However, adjustments and reforms could help strengthen the safeguards.

First, comprehensive legislation for public procurement is a central precondition of clear, transparent and fair public procurement. To strengthen trust in the fairness of public procurement, its legislation should be unambiguous and reliable

over time; core regulations should be passed as parliamentary laws for this purpose. Second, certain steps in procurement, such as needs assessment, definition of technical specifications and contract execution, are particularly vulnerable to corruption as they often involve a high degree of discretionary decision making. Also, control and oversight in these stages are particularly difficult to achieve. Third, standardized, clear and concise procedures and easily accessible, comprehensive documentation contribute in important ways to transparency in public procurement. Fourth, particular attention should be paid to emergency procurement or exemptions that apply when tendering fails. Fifth, safeguarding the integrity of individuals involved in public procurement, *i.e.* the staff of procuring entities and employees of suppliers, is a central means of preventing corruption in public procurement. Sixth, sanctioning legal persons is often considered particularly dissuasive, particularly in areas such as procurement, where companies rather than individuals try to gain undue advantage through corruption. Some countries have therefore introduced the possibility of temporarily or permanently debarment from public procurement any company found guilty of corruption.

As debarment mechanisms can be abused, however, countries that practice debarment are encouraged to ensure that the conditions for applying debarment are precisely and explicitly defined.

Although the law is a major step forward, its implementation is still poor. The fight against corruption is still a very complicated and difficult task, challenging to detect, and requires, above all, both determination and persistence from the political leadership and the participation of all citizens over the whole country. It is of great importance that civil servants involved are educated in a moral and ethical code of conduct (see Basheka, 2011; Bowen *et al.*, 2012).

Following conditions are necessary for fighting successfully against corruption: first, political commitment: political leaders must not take part in corrupt activities and need to provide a good example to their future counterparts; second, an effective anti-corruption system; third, an efficient anti-corruption system: this includes a basic legal framework to prevent and punish those involved in corrupt activities; fourth, a rule on assets declaration for persons who have power, duty and position; fifth, anti-corruption awareness for all must be raised, which would include government officials, prosecutors, judges, newspapers, magazines, lawyers, and the public; this must be done in any form through the organization of seminars, workshops, putting news in the newspapers, magazines and using other possible and effective legal propaganda means; sixth, a Joint Agreement on Coordination between the Supreme People's Prosecutor and the State Inspection

Agency and other organizations concerned must be in place to restructure, strengthen and better coordinate those institutions involved with detecting, investigating and prosecuting those who are involved in corruption; seventh, governance and administrative reform across the country is to be continued to help promote transparency, accountability and to eradicate all kinds of autocracy; eighth, civil servants need to be honest to their country and to the population, and those people employed in the area of finance and accountancy need to abide by the rules and regulations that pertain to finance; finally, ninth, to prevent corruption, public participation is necessary and all state activities need to be open and transparent.

This is a summary of some challenges that African countries could take into account in their reform processes regarding their efforts in the fight against corruption in public procurement.

6. - Conclusion

Everyone would surely agree that corruption deeply affects African society and it could be among the key factors that would explain the blockage of its economic development. This is why the interest of researchers to conduct studies not only on country-specific cases but overall, could help to better understand the causes, forms, drivers and challenges of corruption in public procurement in Africa.

The review of the literature provided sufficient information on various forms of corruption found in several African countries (*e.g.* inflation of contracts, fraud, manipulation of information, extortion, favoritism, etc.). This study finds that the common forms of those countries are favoritism, embezzlement, fraud, extortion, and bribery.

About the determinants, the study finds that the phenomenon of corruption is characterized by social factors, political commitment, organizational factors, and economic factors at 52.3%, which confirms the extension of the findings of the study of Basheka and Tumutegyereize (2006) on the major part of African countries. The difference in weight (40.2% for Uganda) is due to the fact that there are countries where one particular factor is more, or less, dominant than the other. This suggests the existence of other determinants of the phenomenon or challenges emanating from the measurement challenges. Efforts at minimizing public procurement corruption must therefore target the identified challenges at both central and local government levels, which perpetuate the problem of cor-

ruption. Further research could answer some questions such as the correlation between corruption and form of the state; corruption and the Millenium Development Objectives process in Africa; corruption and poverty, etc.

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