



Timo Kivistö

**PROCESSES AND TOOLS TO PROMOTE COMMUNITY
BENEFITS IN PUBLIC PROCUREMENT**



Timo Kivistö

PROCESSES AND TOOLS TO PROMOTE COMMUNITY BENEFITS IN PUBLIC PROCUREMENT

Dissertation for the degree of Doctor of Science (Economics and Business Administration) to be presented with due permission for public examination and criticism in the Auditorium of the Student Union House at Lappeenranta-Lahti University of Technology LUT, Lappeenranta, Finland on the 11th of December, 2020, at noon.

Acta Universitatis
Lappeenrantaensis 932

Supervisors Professor Veli Matti Virolainen
LUT School of Business and Management
Lappeenranta-Lahti University of Technology LUT
Finland

Professor Jukka Hallikas
LUT School of Business and Management
Lappeenranta-Lahti University of Technology LUT
Finland

Reviewers Professor Alessandro Ancarani
University of Catania
Italy

Professor Tünde Tátrai
Corvinus University of Budapest
Hungary

Opponent Associate Professor Anne-Maria Holma
School of Management
University of Vaasa
Finland

ISBN 978-952-335-583-5
ISBN 978-952-335-584-2 (PDF)
ISSN-L 1456-4491
ISSN 1456-4491

Lappeenranta-Lahti University of Technology LUT
LUT University Press 2020

Abstract

Timo Kivistö

Processes and Tools to Promote Community Benefits in Public Procurement

Lappeenranta 2020

107 pages

Acta Universitatis Lappeenrantaensis 932

Diss. Lappeenranta-Lahti University of Technology LUT

ISBN 978-952-335-583-5, ISBN 978-952-335-584-2 (PDF), ISSN-L 1456-4491, ISSN 1456-4491

Public procurement differs from private purchasing by the fact that goods and services are bought by taxpayers' money. For that reason there are regulations to safeguard that the money are appropriately used. Globally, public procurement accounts for 5% to 20% of the global GNP. Alongside efficiency objectives, public procurement is seen as a vehicle to promote other political objectives. This thesis is derived from a managerial problem regarding ways to promote community benefits in the process. A number of selected types of community benefits are introduced and elaborated upon while processes and tools to promote those are summarized.

Secondary data have been used as part of the qualitative research methodology. The data were derived from annual reports, invoices, and lists of innovation project descriptions.

In this thesis, public procurement is defined and national spend is calculated and organized into multiple legal categories. In further exploration, an investigation of innovations is presented using a database describing innovations in the health and social care sectors. Professionals concerned with green public procurement look for tools to enhance the green impact. Local and SME procurements in seven municipalities are studied. In the introduction the processes and tools for the procurement professionals are summarized. The introduction also presents the view of multiple scientific silos in public procurement.

A neglected area is recognized with this research, namely in-house procurement, or "procurement called by another name" as it's referred to in the literature. In the national spend in Finland the total procurement volume is 52 billion euros compared to the 38 billion euros figure that is often quoted. Innovation procurement can use many frameworks. Of note, a procurement system for off-the-shelf innovations could be created.

Green public procurement should be employed in multiple procurement process levels, and the aspiration could have an environmental impact instead of just legal compliance. In municipal procurement SMEs seem to have their GNP share of business. When looking at local suppliers' share, it is derived both from the proximity of a larger city and from public sector structure.

This work contributes to the field with a definition of public procurement in accounting terms and revelations of procurement when called with other names. Both are connected to in-house and other government-to-government procurements. From the view of processes, monitoring and procure-to-pay processes in promoting community benefits are scarcely researched areas.

Further research should be directed to in-house and other government-to-government procurement. A comprehensive view of procurement transactions is also missing. Another path to understand public procurement in different scientific silos is to conduct in-depth literature reviews in administrative, technological, public management, and legal silos. Focusing impacts, the literature review on healthcare or environmental economics is likely to reveal further research directions.

Keywords: public procurement, spend, sustainability, green PP, SME, local supplier, process, tool

Acknowledgements

I would like to thank my supervisors Veli Matti Virolainen and Jukka Hallikas for pushing me part by part to the final stages of this thesis. For Jukka, special thanks for recruiting me as a part-time researcher for two projects. Without this employment, I would not have started this thesis.

I would also like to thank colleagues at LUT University, Sanna Heinänen, Daniela Grudinski, Katrina Lintukangas and Anni-Kaisa Kähkönen for inspiring research projects.

I would like to thank the preliminary examiners of this thesis, Professors Alessandro Ancarani and Tünde Tátrai, for their constructive criticism and valuable suggestions for improvement. Further I would like to thank Anne-Maria Holma for agreeing to act as the opponent at the public defence.

In addition I would like to thank my consulting colleague Matti Riuttamäki for assisting me in data analysis and looking at invoice data from seven municipalities.

My family Anne, Anna-Reetta, Eva-Stina and Ada-Maria I thank for patience during the process. In the future I will be absentminded for other reasons.

This work was carried out in the School of Business and Management at Lappeenranta-Lahti University of Technology LUT, Finland, from 2012 to 2020.

Timo Kivistö
November 2020
Espoo, Finland

Contents

Abstract

Acknowledgements

Contents

List of publications	13
1. Introduction	15
1.1 Motivation and background	15
1.2 Aim and research questions	18
1.3. Positioning of the study	25
1.4 Outline of the study.....	27
2. Theoretical Point of Departure	29
2.1. Public procurement in the view of scientific silos	29
2.2. Procurement processes and tools.....	43
2.2.1. Procurement processes in general	43
2.2.2. Green public procurement.....	44
2.2.3. Public procurement of Innovations	46
2.2.4. SME and local involvement.....	52
2.2.5. Social aspects of public procurement.....	54
2.2.6. Summarizing processes and tools	54
3. Research Methodology	59
3.1. Research approach.....	59
3.2. Research design.....	61
3.3. Methodological choices.....	63
3.3.1. Qualitative research.....	63
3.3.2. Archival sources/secondary data.....	65
3.3.3. Case selection.....	65
3.3.4. Data gathering	65
3.3.5. Data analysis	66
3.4. Validity and reliability of the study	66
4 Review of the Results	69
4.1 Public procurement spend analysis at a national level in Finland (Publication I).....	69
4.2 Innovative procurement processes and their use in the social and healthcare sector (Publication II)	72

4.3 Processes for innovative public procurement (Publication III)	77
4.4 Monitoring Green Public Procurement (Publication IV).....	79
4.5. Analyzing local and SME participation in public procurement – evidence from seven Finnish municipalities (Publication V)	82
5 Discussion and Conclusions	87
5.1. Theoretical contribution.....	87
5.1.1. Public procurement in accounting terms.....	87
5.1.2. Multiple scientific silos.....	87
5.1.3. Using reliable secondary data	87
5.1.4. Public procurement of innovations	88
5.1.5. Green public procurement.....	89
5.1.6. Local and SME procurement	89
5.1.7. Processes and tools.....	90
5.2. Managerial implications	90
5.3. Limitations.....	91
5.4. Further research directions	91
References	93

Publications

List of Figures

- Figure 1: Annual procurement volume (bn€) by industries 2018 in Finland
- Figure 2: Average procurement volume by organization
- Figure 3: Public procurement by legal framework
- Figure 4: Innovation procurement
- Figure 5: Forward Commitment Framework
- Figure 6: Research design
- Figure 7: Public sector's relation to other institutional sectors of the economy
- Figure 8: Process of calculation for size of public procurement
- Figure 9: Public procurement by type
- Figure 10: Procurement by entity type
- Figure 11: Public procurement by legal framework
- Figure 12: Number of cases according to the innovation framework of Keeley et al. (2013)
- Figure 13: Calculation process for local procurement, employment and tax revenue
- Figure 14: Procurement volume by supplier organization type
- Figure 15: Local employment by industry in Sastamala

List of Tables

- Table 1: Positioning the Individual Publications
- Table 2: Positioning the Publications in PP Content and Theory Building Framework
- Table 3: Governance Models by Considine and Lewis (2003)
- Table 4: Comparison of Literature Reviews in PSM and PP
- Table 5: Classification Framework used by Patrucco et al. (2017)

- Table 6: Classification Framework for Health and Social Care
- Table 7: Classification Framework for Legal Articles
- Table 8: Top 10 Journals Identified by Lange et al. (2014)
- Table 9: Top 20 Public Administration Journals Identified by Wang et al. (2018)
- Table 10: Top 7 Architecture and Construction Management Journals Chosen by Ke et al. (2009)
- Table 11: The Silo View of PP
- Table 12: The Different Views of Political Economics
- Table 13: Articles in the Study of Patrucco et al. (2017) Identified by Process Level
- Table 14: Ontological and Epistemological Approaches (Adapted from Morgan and Smircich 1980)
- Table 15: Comparison of Different Views (Adapted from Järvensivu and Törnroos (2010)
- Table 16: Research Methods by Yin (2017)
- Table 17: Innovation Cases by Category Type
- Table 18: Green Public Procurement Maturity Model

List of publications

This dissertation is based on the following papers. The rights have been granted by publishers to include the papers in dissertation.

1. Timo Kivistö, Veli Matti Virolainen: Public procurement spend analysis at a national level in Finland, Published in Journal of Public Procurement, June 2019
2. Timo Kivistö, Daniela Grudinschi, Jukka Hallikas, Sanna Sintonen: Innovative procurement processes and their use in social and healthcare sector. International Public Procurement Conference, Dublin 2014 Working paper
3. Timo Kivistö, Jukka Hallikas: Processes for innovative public procurement. 25th Annual IPSERA Conference, Dortmund 2016, Working paper
4. Timo Kivistö, Luitzen de Boer, Jukka Hallikas: Monitoring Green Public Procurement, 24th Annual IPSERA conference, Amsterdam 2015, Working paper
5. Timo Kivistö, Veli Matti Virolainen: Analyzing local and SME participation in public procurement – evidence from seven Finnish municipalities in Thai (ed): Global Public Procurement Theories and Practices, Springer International 2017

Author's contribution

- (1) Drew up the research plan, collected the data, wrote most of the publication; Virolainen's role was to improve the structure for a scientific publication.
- (2) Drew up the research plan, collected most of the data alongside Grudinschi and Sintonen, wrote most of the publication; Jukka Hallikas was responsible for the literature review and improved the structure of the publication.
- (3) Drew up the research plan with Jukka Hallikas, analyzed the data and wrote most of the publication; Jukka Hallikas improved the structure of the publication.
- (4) Drew up most of the research plan together with Luitzen de Boer, using secondary data from a research report, wrote most of the publication; Jukka Hallikas improved the structure of the publication.
- (5) Drew up the research plan, collected the data, and wrote most of the publication; Virolainen improved the structure for a scientific publication.

1. Introduction

1.1 Motivation and background

Public procurement (PP) is the purchasing made in public organizations. The main difference between private enterprises and public organizations is that general government organizations do not have sales revenues, instead the operations are financed by taxpayers' money or in the case of developing countries, by financing institutions (Leon de Mariz, p.2). For those reasons in most countries there are regulations how to conduct public procurement. The objective of private corporations is to make return-on-investment (ROI) and earnings per share for shareholders as stakeholders. In public organizations there are multiple stakeholders, notably elected members in a decisive role (Murray 2007).

Public procurement was more specifically defined by United Nations Development Programme (UNDP) the "overall process of acquiring goods, civil works and services, which includes all functions from the identification of needs, selection and solicitation of sources, preparation and award of contract, and all phases of contract administration through the end of a services' contract or the useful life of an asset" (UNDP, 2010, p.5).

Aside from the general governmental activities there are publicly owned operations that cover their costs. This part of the public economy is called the utility sector, which engages by the definition of the EU with water and electricity supply and provides infrastructure for traffic, such as ports, airports and railways. These services are at least in Finland part of a local monopoly situation and therefore subject to public procurement regulations. The situation is likely to be likewise in the European Union.

General government entities have organized their operations in the central government, municipalities and other type of subcentral governmental organizations, such as hospital districts in Finland. These organizations have established corporations to serve the government, but also public or private enterprises. One of these operations is bookkeeping and payroll services. The share of corporations has risen and they may have several public owners. The same kind of specialization and consolidation has happened in large private enterprises. However, these publicly owned corporations, with full revenue, may have to follow the rules of public procurement, if the board of directors are controlled by public organizations.

Public procurement (PP) accounts for 5% to 20% of the Gross National Product (GNP) of the world according to the statistics by Organization for Economic Co-operation and Development (OECD, 2015), which makes it a large economic activity. With this thesis there was the opportunity to use the extensive set of statistics offered by Statistics Finland as an example of an organization within a country in the European Union (EU). The categories of public procurement are likely to be the same as in other EU countries, but the national procurement volumes are likely to be different. The Finnish Act on Openness

of Government Activities concerns also public procurement. In recent years large procurement units have published open invoice data, city of Helsinki as an example. As shown in Figure 1 (values OSF1 except for public services 2013 [figures by Kivistö and Virolainen, 2019]) the procurement volume of public entities is greater than that of the forest, chemical and electrical industries, which are traditionally considered as large businesses in Finland. Only wholesale and metal industry businesses are about the same size as PP.

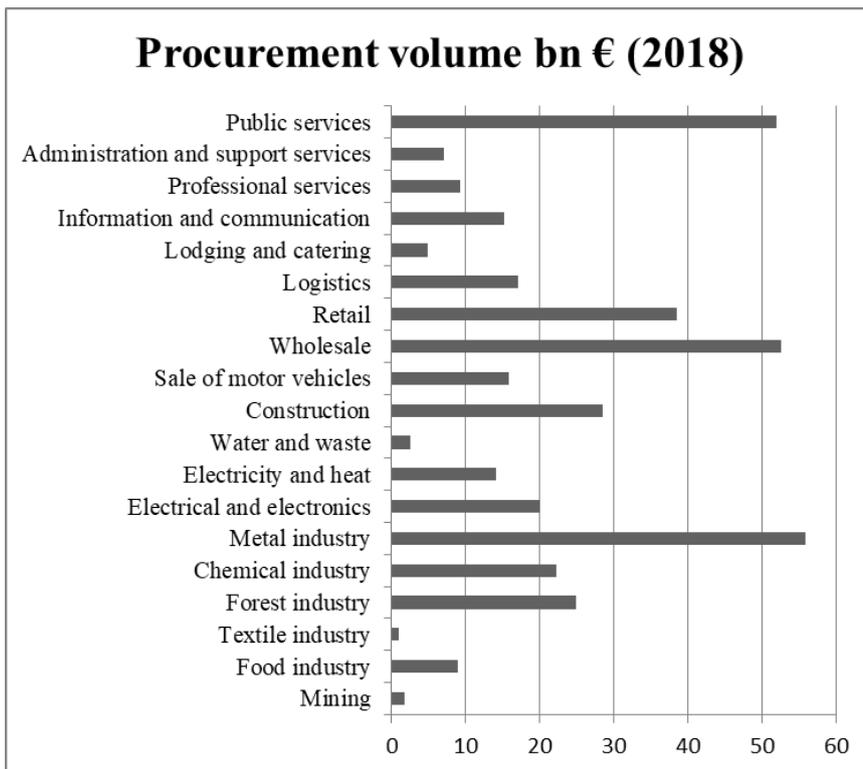


Figure 1. Annual procurement volume (bn €) by industries 2018 in Finland

Operationalization of development activities could include a categorization of public entity sizes. In Finland there are about 2,800 public entities which include 311 municipalities (OSF2), 140 joint municipalities (OSF2), and 2,336 publicly-owned enterprises (OSF1). Out of these approximately 10 are joint procurement entities (which procure for several independent entities) and about 50 are large procurement offices. This means 2% of the procurement units are large while 98% are small and therefore likely to have decentralized procurement.

When procurement volume is analyzed on an enterprise or public entity level, public entities are typically larger than the size of the average business, and are at the same level

as the forest, chemical, and electronics industries. However, Figure 2 expresses the total procurement volume on the enterprise or public entity level. The procurement spend conducted by the procurement department is usually less. The figures represent the current procurement volume.

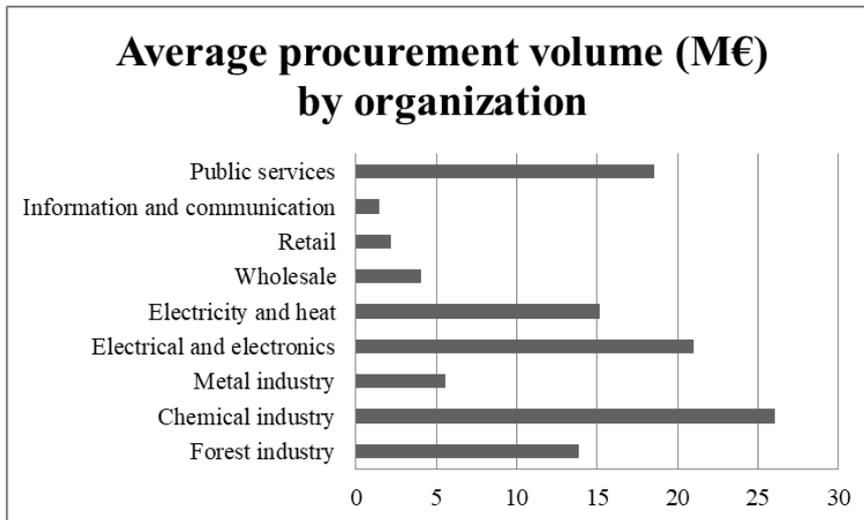


Figure 2. Average procurement volume by organization

As procurement is made by public entities, there is the tendency to use public procurement as a vehicle for social outcomes (McCrudden, 2004); this runs alongside economic goals in the legal silo. Arrowsmith (2010) used the term “horizontal policies” or “secondary policies” in contrast to the primary objective of a procurement for obtaining goods, works, or services on the best terms. All kinds of secondary policies, such as those relating to sustainability, small- and medium-sized enterprises (SME), and local innovation policies can be placed under the umbrella concept of horizontal policies. In the economic silo, some of these secondary objectives have been referred to in other terms such as socially responsible sourcing (SRS [Zorzini et al., 2013]), sustainable supply chain management (SSCM [Carter and Rogers, 2008]), logistics social responsibility (LSR [Carter and Jennings, 2002]), and socially and environmentally responsible procurement (SERP [Hoejmoose and Adrien-Kirby, 2012]). Lynch et al. (2019) referred them as “community benefits” (CB) and summarized the development of a series of International Research Study of Public Procurement (IRSPP). A recent development is that climate change has become a strategic issue – with EU climate action and the European Green Deal as examples.

Using the framework of Harland et al. (2007), the two highest levels of public procurement maturity emphasize supporting or delivering broader political objectives such as creating employment, reducing poverty, and providing healthcare. The EU has

also emphasized innovation in public procurement (European Commission 2006). The goals of public procurement can be seen in the literature review by Patrucco et al. (2017). Judging by the number of articles, greatest goals are efficiency (40), competition and fairness (21), social PP (15), green PP (7), and local economy development (4). Innovation is classified under the performance picture (13). Judging by the numbers, still the greatest share of articles are about the primary objectives of public procurement. In their literature review Zorzini et al. (2013) addressed all industries in recognizing risk management, reporting, standards, codes of conduct, and measures of sustainability.

From the managerial point of view there is the requirement of promoting community benefits alongside economic goals. On an organizational level, drivers and barriers have been recognized. On the individual level the question was raised by Igarashi et al. (2017) regarding Green Public Procurement (GPP) and Eikelboom et al. (2018) regarding sustainable innovation. The research gap has to do with the individual level and the multiple aspects of community benefits: Which processes and tools are needed to achieve this task? From the theoretical point of view this thesis is about public procurement in a managerial context, based on supply chain management theory.

1.2 Aim and research questions

As noted in the previous chapter there are traditional efficiency, competition and fairness goals in public procurement. In addition to those Harland et al. (2007) raised the objective of supporting and delivering broader political objectives in public procurement. These goals can also be partly realized in every procurement using the community benefits tools.

From the view of procurement directors or managers, there is a need for procurement processes and tools to support the promotion of community benefits in practice. Most public procurement research has been concentrated on determining whether community benefits have been realized, noting the drivers and barriers associated with them. There has been little research on these processes. However, there are textbooks (gray literature) which describe good procedures for public procurement, although these are usually restricted to a certain legal framework.

The research question herein is, “What kind of processes and tools are needed to promote community benefits in public procurement?” Figure 3 illustrates the thesis structure. The first view is the monetary spend and legal view on PP. Managerially procurement directors should be comprehensive to address their action to all procurement. However, legally they may fall into different procedures, especially in the case of in-house procurement. Secondly innovations are investigated in two separate publications using the same cases from three countries. Thirdly, Green PP is viewed based on a multiple case study of five Nordic Countries. The fourth view looks at local suppliers in particular and the inclusion of small and medium sized enterprises (SME) in PP. Within these publications are then analyses and summaries of the processes and tools for the procurement professionals to support the community benefits view in PP.

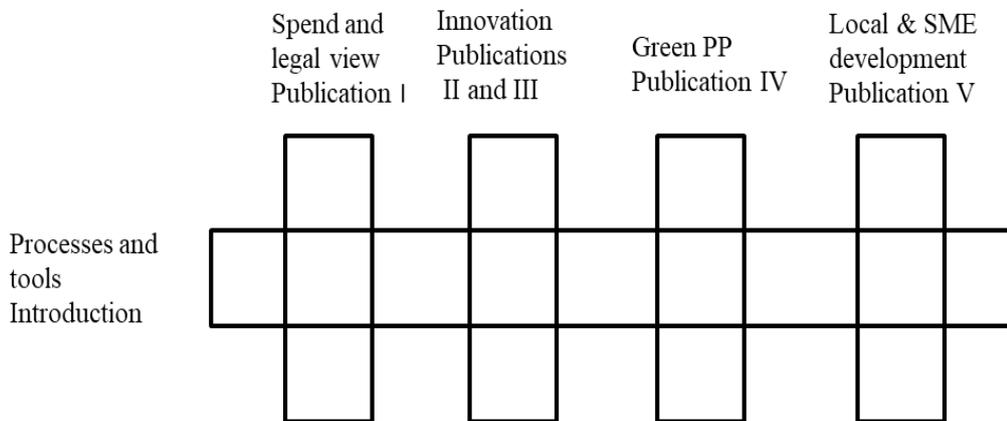


Figure 3. Processes and tools promoting community benefits in public procurement

The first set of sub-questions relative to the main question are:

What is the total spend in public procurement?

What kind of entities are procuring?

What are they procuring? and

With what kinds of legal frameworks are the procurements conducted?

In order to have an impact on public procurement as a whole, the term must be defined and a reliable value needs to be calculated. The nationwide value indicates what type of procurement is nationally important and how it could be scaled down to the organizational level. Up to now there has been no sound definition (Prier and McCue, 2009) for public procurement. The economic discussion has been dominated by the international institutions such as the OECD and the World Bank, who claim that there have been no reliable statistics relating to PP (World Bank Group, 2016, p. 5). Researchers have relied on figures provided by international organizations (Patrucco et al., 2016), national statistics on governments in general, or figures on certain governmental departments (Pegnato, 2003; Coggburn, 2003). Usually, PP estimates are in the introduction part of the articles. Therefore, a spend analysis of all public entities on a national level is required. In a review of the literature on public procurement (Patrucco et al., 2017), the topic was not even mentioned. The issue could be positioned under environmental topics in the classification framework by Patrucco et al. (2017) as part of a monetary or economic environment.

However, the authors of only a few studies have attempted to calculate the amount of PP. Audet (2002) explains the two types of PP estimation. The first type is calculated on the figures derived from the System of National Accounts (SNA). The second type is the bottom-up method (e.g., surveys based on procurement notices conducted by the World Trade Organization [WTO] and the Official Journal of the European Commission). SNA-based methods are widely used because they are easily available and allow country-wise comparisons. Nonetheless, Audet (2002) cautioned against the use of these estimates as

they often omit corporations owned by public entities. Bergman (2008) attempted to calculate the monetary value of PP in Sweden using four different methods. He recognized differences in public expenditures and procurements under EU directives and he calculated the amount procured by corporations owned by public entities. Cernat et al. (2015) used data derived from the SNA for calculating PP value, as did Konkurrensverket (2015) who focused on the legal framework of procurement. However, they did not include exceptions from directives and procurements between public entities.

The second set of sub-questions are:

What is an innovation and when does it cease to be an innovation?

What is the goal of innovative procurement?

- market effects
- better public service
- public service for lower cost

What kinds of innovations are there by product and service categories?

What kinds of innovations are there judging by their novelty?

Are there procurement processes for different kind of innovations?

Innovation seems to be an ambiguous construct in public procurement. Innovations are seen as levers for economic growth, but both a definition and goalsetting are missing. The difference between innovation and invention is that an innovation is commercialized (Schumpeter, 1939). The innovative product can either be demand-originated or created by a technology push. Edler and Georghiou (2007) noted that about 50% of innovations are demand-driven and 12% come from suppliers. That means that the first customer is buying a demand-driven innovation and the subsequent customers are procuring off-the-shelf innovations. A technology push can create radical improvements whereas customer demand usually results in incremental improvements (Brem et al., 2009). Enabling a technology push is an important objective when designing processes.

Rolfstam et al. (2011) raised questions about innovation diffusion and found several barriers that could be overcome. These include proof of the benefits for the organization and access to the innovations in normal ordering channels; there was also discussion of a product champion in the using organization promoting the product or service.

When discussing the role of an R&D department it is important to note that innovations in service businesses differ from those in product businesses (Nijssen et al., 2006): “Together with the organization of NSD around customers’ market pull, this suggests a smaller role and influence of the R&D department in service development” (p. 242). When making radical innovations, the role of R&D is significant. Innovations in the public sector face organizational challenges because in many cases there is no R&D department (Yeow and Edler, 2012; van Putten, 2012). On the other hand, Rolfstam et al. (2011) wrote that in the National Health Service (NHS) in the United Kingdom there were 23,000 ongoing research projects one year. It seems that larger healthcare organizations can have research, development and innovation (RDI) units.

Procurement processes were suggested by Edquist (2009), starting with broad ideas about what paying customers and user customers are looking for. Edquist (2009) suggested that this interactive learning – or in purchasing terms, early supplier involvement – should be multidisciplinary; and that it is likely to occur several times. Schiele (2010) mentioned two tools for early supplier involvement: technology roadmaps and innovation workshops. The process description does not discuss the goals of innovation processes.

The third set of sub-questions are related to Green Public Procurement:

- 10) What are the processes and tools for promoting green public procurement GPP?
and
- 11) How can GPP be improved?

First a definition is needed. Bouwer et al. (2005) analyzed 21 different definitions of GPP and coined perhaps the most comprehensive definition: “Green Public Procurement is the approach by which Public Authorities integrate environmental criteria into all stages of their procurement process, thus encouraging the spread of environmental technologies and the development of environmentally sound products, by seeking and choosing outcomes and solutions that have the least possible impact on the environment throughout their whole life-cycle.” In the report the authors recognized four building blocks for the definition: (1) greener products; (2) the use of green technology; (3) greener functionality (outcomes) rather than defined products; and (4) green procurement process. The authors also separately discussed environmental technology and classified it as a procurement outcome.

Secondly, there have been a number of studies on drivers and barriers. Hoejmose and Adrian-Kirby (2012) conducted a literature review of socially and environmentally responsible purchasing. Giunipero et al. (2012) looked specifically at drivers and barriers to sustainable purchasing. Barriers, when examined from process and tools perspective, reveal the lack of sustainability standards and appropriate regulations, when different continents and the whole supply chain are considered. Notably, different industries had different agendas in sustainability issues and the perceptions from developed countries were different from those of developing countries. Tate et al. (2012) conducted a literature review on environmental purchasing and supply management (EPSM) and analyzed the various subjects and theories in the articles. From application of the processes and tools perspective, the authors recognized 61 different EPSM practices categorized as (a) general practices; (b) supplier involvement; (c) supplier development; (d) supplier selection criteria; and (e) supplier environmental outcomes. The authors also noted that the published research is likely to lag behind as practices are developing more quickly.

Oruezabala and Rico (2012) interviewed 15 hospital purchasing managers, highlighting the environmental supply chain approach and total cost of ownership (TCO), as well as suggesting environmental innovations by suppliers. On logistics matters the supply base reduction is highlighted as reducing the number of deliveries. Amann et al. (2014) investigated tender documents in relation to GPP and Socially Responsible PP (SRPP). They found that GPP is already well implemented whereas in SRPP there is room for

improvement. Bratt et al. (2013) looked at the strategic criteria development of two purchasing categories from the view of sustainability. Renda et al. (2012) measured the uptake of green criteria in 27 EU countries in product categories having EU GPP criteria. Testa et al. (2016) analyzed tender documents in the construction sector of Italy. They find that GPP criteria are only partially used and focused on energy consumption. They also pointed out that for policy makers there should be standard tools for monitoring GPP. In addition, the writers suggested GPP tender templates should be used. Dagiliute and Anikanova (2011) looked at GPP uptake in the Lithuanian experience evaluating RFP documents including GPP criteria as a legal compliance. Tsai (2015) described the legal environment for GPP and market share changes for renewable energy; they also presented emission values in Taiwan.

With the traditional, legally conducted, way of looking GPP, the reviewer recognizes whether green criteria have been implemented in the tender process in one or more phases. From natural sciences or engineering view the research interest has to do with identifying the measurable environmental effects of GPP. Cerutti et al. (2016) investigated the carbon footprint of seven fruits and vegetables in a municipality procurement and found that their farming causes the greatest part of the carbon footprint; the second was the local distribution whereas the transport from production facilities to the city was of minor importance. Tarantini et al. 2011 studied PP in the construction sector and specifically procurement of windows for buildings with life cycle assessment. The authors determined that the environmental effect comes from isolation effects which occur during use. Alvarez and Rubio (2015) look at carbon footprint in the service industry, in riverside conservation and maintenance services. Tsai (2015) gave an example of government policy and its effect on the market of green products alongside the total development of measurable environmental effects.

Environmental management systems are recognized as one of the selection criteria in PP. ISO 14000 (ISO, 2009) is a family of 15 standards based on the environmental management system ISO 14001. The standard ensures that the enterprise conducts their environmental procedures in a consistent way. The standard itself does not set requirements for the environmental level.

In 2008 the European Commission made a recommendation for developing EU GPP criteria. Since then, more than 20 sets of criteria have been developed to focus on the greatest environmental effects and the share of monetary volume of public procurement. These EU GPP criteria (European Commission, EU GPP criteria) complement environmental systems in terms of required levels. The contents of the criteria are classified into two levels: the core criteria and the comprehensive criteria. In the communication of these, they also emphasized monitoring GPP with (1) a quantitative indicator expressing the percentage of GPP in relation to all public procurements; and (2) an impact-oriented indicator expressing the environmental and financial gains achieved by GPP.

Two studies relating to this were carried out by PricewaterhouseCoopers ([PwC], 2009) and Renda et al. (2012). PwC elaborated on the indicators defined by the European

Commission (2008). In addition to the quantitative indicators, they made calculations related to CO₂ emissions and cost impacts for public organizations, using both core and comprehensive criteria. Despite these efforts to establish criteria for measuring the effectiveness of GPP efforts, there seems to be little evidence of widespread monitoring in practice.

The fourth set of sub-questions are:

- 12) What is level of local procurement in municipalities?
- 13) What is the level of procurement from SMEs?
- 14) How should the situation be improved?

One of the objectives in the new public procurement directive 2014/24/EU (European Commission, 2014) is “facilitating in particular the participation of small and medium-sized enterprises (SMEs) in public procurement.” PwC (2014) estimated that in EU-27 countries, SME access to public procurement is 27% below the share of the national economy. These sources indicate that SMEs should enjoy more of the benefits offered from procurement in their respective home countries.

Kidalov and Snider (2011) analyzed small business policies in the United States and the European Union. They found several aspects of public procurement policies. One of the differences in the policies related to size caps: The European Union has one cap in all industries, whereas the United States has individual caps considering both the sizes and the competition environment in different industries. In the US, there are also certain procurement programs for innovation targeted at SMEs. Kidalov and Snider concluded that SMEs’ access to public procurement is still an overall policy but it lacks exact procedures.

Nicholas and Fruhmann (2014) questioned the existence of SME policies, indicating they are fuzzy and that SMEs are treated as one group. They also concluded that political goals will dominate economic motivations. The authors of another study in the United Kingdom (UK) (NERA Economic Consulting, 2005) approached the issue with statistics covering both procurement and SMEs. “None of the work undertaken in this study – statistical analysis, literature review and case studies – suggests that there is any sound basis for deriving an ‘optimal’ level of procurement from smaller firms, either in aggregate or in any specific market,” they wrote (NERA, 2005, p. vi).

The focus of the existing literature has to do with SME access to PP (PwC, 2014; Kornecki, 2011) and perceptions of and experiences with PP (Karjalainen and Kemppainen, 2008; Loader, 2015; Loader and Norton, 2015; Flynn and Davis, 2015). Marketing and tendering behaviors were analyzed by McKeivitt and Davis (2013); market orientation was reviewed by Tammi et al. (2014); and SME participation in tendering was examined by Flynn et al. (2015). SME success in tendering was studied by Stake (2014). These projects were conducted from the SME supplier’s view. The public organization view was provided by Loader (2011) who created a survey on SME policies in local governments in the UK.

Local procurement research can be categorized and divided into two legal environments: that of the United States and that of the European Union. Local procurement in the US environment was investigated by Qiao et al. (2009), Nijaki and Worrel (2012), and Williams (2014); Cabras (2011) and Mamavi et al. (2014) studied it within the European Union under spatiality terms. Qiao et al. (2009) reviewed all kinds of preferential programs and found the existence of local procurement in most; they also found that many respondents felt that preference programs violated free competition and may have caused higher prices and made purchasers' work more difficult. The authors suggested further research on gains, costs, success rates, monitoring, and alternative solutions. Nijaki and Worrel (2012) conducted an archival analysis of local procurement programs in the US. Williams (2014) investigated local preferences in the environment of one municipality and recommended an evaluation of whether preferential treatment results in a beneficiary outcome. Mamavi et al. (2014) found a correlation between construction work and more local suppliers, whereas the opposite was found to be true with goods and services. Cabras (2011) analyzed the procurement volume of one county in the UK, mapping its spatial distribution. He found that social services and construction have the greatest procurement volumes and that specialized consulting and other specialized services are concentrated in the Greater London area. He also analyzed the dynamic effects of procurement by surveying suppliers about their first-tier subcontractors.

The majority of the available studies comprise surveys either of SMEs or public entities in the form of qualitative papers on policy matters. Stake (2014) used actual bidding results and statistically significant findings to demonstrate how SMEs succeeded in winning PP contracts.

Public procurement data are generally from procurement notices (Kornecki, 2011; Mamavi et al., 2011; PwC, 2014). Stake (2014) used competition results from eTendering software. If the data source was procurement notices, the research was focused on tenders over the EU threshold values (euro 209,000 or higher), unless the national legislation required notices under EU threshold values or the public entity voluntarily put a notice under threshold value. That left out most of the procurement under threshold values, either in competition or direct purchases.

SME policies are dominated by political goals rather than economic motivations (Nicholas and Fruhmann, 2014). Local procurement is scarcely researched. According to the European procurement directives, economic operators (suppliers) shall be treated impartially, meaning that local suppliers shall not be favored. The research data in current literature is based on procurement notices or suppliers participated in tendering. Invoice data and direct orders are missing from the data sources.

The fifth sub-question category focuses on the main question:

- 15) What processes and tools are available for promoting community benefits in public procurement?

In the process and tools view of community benefits in public procurement, the research is focused on the sourcing process and policy matters. As shown in the literature review by Patrucco et al. (2017), there is no single paper on procure-to-pay processes and monitoring and reporting are scarcely represented. Processes and tools are mentioned in some articles (Tate et al., 2012, Wondimu et al., 2018). Process descriptions can be too long for academic journals as is the case with Lahdenperä (2009) – 79 pages. One notable dimension is that authors of processes and tools involve practitioners (Wondimu et al., 2018, Sebastian and Davison, 2011). Usually the authors of journal articles focus on one phenomenon such as early constructor involvement, as mentioned earlier (Wondimu et al., 2018).

1.3. Positioning of the study

This thesis consists of five publications that describe the investigation of the frameworks for public procurement in general and the selected parts of community benefits from public procurement specifically. Table 1 describes the positioning of the individual publications.

Table 1. Positioning the individual publications

Publication	Main perspective	Approach	Research methods	Data
I	The monetary value of public procurement	Inductive	Single case study	Statistics, annual reports
II	Innovation in social and health care	Inductive	Archival analysis	Secondary data of innovations
III	Service innovation approach	Inductive	Archival analysis	Secondary data of innovations
IV	Green public procurement	Inductive	Multiple case study	Case study in 5 Nordic countries
V	Local and SME procurement	Inductive	Multiple case study	Invoice data from 7 municipalities

This thesis is about public procurement in a managerial context, based on supply chain management theory.

Chapter 2.1 recognizes several silos in public procurement: (1) engineering management; (2) economics management; (3) administration sciences and politics; (3) health and social management; (4) other public management; and (5) legal factors. This thesis is positioned in the economics management silo.

In the purchasing and supply management field the genres can be divided into the categories of either public procurement or private purchasing. The public procurement

genre in management was introduced by the National Institute of Governmental Purchasing and the Journal of Public Procurement in the US. On the international scene, one of the starting points was the 2003 International Research Symposium of Public Procurement (IRSP) in Budapest. Wang and Bunn (2004, p. 84) said that “public procurement has been a minor subset of industrial or business-to-business purchasing.” Larson (2009) looked at supply chain management in public and private organizations. He concluded that public procurement professionals have a narrower scope on supply chain management (SCM) and different perceptions of what constituted the important topics. The narrower scope could be due, first of all, to the fact that in most public entities there are only inbound logistics; it could also be due to the fact that materials are only a small fraction of procurement. Arlbjørn and Freytag (2012) recognized several differentiating factors between public procurement and private purchasing. They pointed out the objectives of the organization, profit for the private sector, and multiple goals with no profit in the public sector. There are also procedural requirements concerning public procurement.

Within public procurement the genres are related to a specific legal environment. As the shown in the literature review by Patrucco et al. (2017), the United States of America represents a great number of published articles and makes its own legal environment. The other big legal environment is the European Union. In the analysis is not taken into account all the other legal frameworks which fall outside the European and US frameworks. The European Union’s legal framework has been adopted for this thesis.

Patrucco et al. (2017) classified the contents of Journal of Public Procurement articles into seven categories: PP strategy content, PP strategy goals, PP processes, PP tools and procedures, PP organization, PP environment and PP performance. Koala and Steinfeld (2018) looked at the articles of the same publication on theory building perspective. The articles are classified according to a hierarchical level of theory building composed of six levels: rapporteurs, reporters, testers, qualifiers, builders and expanders. These frameworks are used to describe the positioning of individual publications of this thesis, as shown in Table 2.

Table 2. Positioning the Publications in PP Content and Theory Building Framework

Publication	Main perspective	Content classification	Theory building
I	The monetary value of public procurement	Environmental/monetary	Expander
II	Innovation in social and health care	Performance/Innovation	Reporter
III	Service innovation approach	Performance/Innovation	Tester
IV	Green public procurement	Goals/Green public procurement	Qualifier
V	Local and SME procurement	Goals/Local economy development	Builder

Introduction	Summarizing processes and tools	Processes/Tools and procedures/Multiple to promote community benefits	Builder
--------------	---------------------------------	---	---------

Publication I should be positioned in the environment content class, but there is no such classification. It seems monetary investigations of this type are missing from PP research. Motivation for why this publication should be an expander is that it provides a sound definition of public procurement in accounting terms and reveals a great share of government-to-government procurement. This type of monetary flow is typically not called procurement, but it could be called “procurement under governance models.”

Flynn and Davis (2014) investigated the use of theories of the field by reviewing articles in the *Journal of Public Procurement*. They found 26 different theories classified into (1) economics, (2) sociology, (3) management, and (4) psychology. This thesis falls into management discipline and thereunder supply chain management theory.

1.4 Outline of the study

The theoretical point of view offered in Chapter 2 sheds light on the multiple scientific silos in public procurement as well as its construct in this thesis. An earlier version of chapter 2.1. was published as an article in the work of Thai, Salia, and Mwakibinga (eds.): *Advancing Public Procurement: Theories and Practices: An Exploratory Literature Review across Scientific Silos on Public Procurement*. The methodology section clarifies the data collection and the methodology for analysis. Chapter 4 summarizes the results of the individual publications. In the final chapter, the results are further developed and the theoretical contributions as well as the managerial implications are discussed. Finally, limitations and future research directions are presented.

Part II presents five original publications that make up the core of the thesis. One of the works was published in an international journal and another (Publication V) in a scientific book. The three other publications are peer-reviewed working papers in international conferences.

Publication I of this dissertation, *Public procurement spend analysis at a national level in Finland*, was written in two phases, first as a working paper for the International Purchasing and Supply Educational and Research Association (IPSERA) conference 2015 in Amsterdam, the Netherlands, and then in a revised format for a journal publication in *Journal of Public Procurement*. The idea, data collection, and writing were mostly put in place by the doctoral researcher. Co-author Veli Matti Virolainen provided guidance regarding the structure and presentation of the results for a scientific journal.

Publication II, *Innovative procurement processes and their use in social and healthcare sector*, was presented as a working paper at the 2014 International Public Procurement conference in Dublin. The idea, the majority of the data collection, and writing was done

by the author. The coauthors—Daniela Grudinschi, Sanna Sintonen, and Jukka Hallikas—contributed to the literature review and some of the data collection.

Publication III, *Processes for innovative public procurement*, was presented as a working paper at the IPSEERA Conference 2016 in Dortmund, Germany. The data were already collected for the publication II and further analyzed and written mostly by the doctoral researcher. Co-author Jukka Hallikas contributed to the structure of the publication.

Publication IV, *Monitoring Green Public Procurement*, was presented as a working paper at the IPSEERA conference 2015 in Amsterdam, the Netherlands. The publication was mainly written by the doctoral researcher. Co-authors Luitzen de Boer and Jukka Hallikas contributed to the structure of the publication.

Publication V, *Analyzing local and SME participation in public procurement – evidence from seven Finnish municipalities*, was presented at the 2016 International Public Procurement conference in Bali, Indonesia, then further revised as an article published in the 2017 work of Thai (ed.): *Global Public Procurement Theories and Practices* (Springer). The idea for the publication, the collection of data, and writing were primarily conducted by the doctoral researcher. Co-author Veli Matti Virolainen provided guidance as to the structure and presentation of the results in the scientific publication.

2. Theoretical Point of Departure

2.1. Public procurement in the view of scientific silos

The monetary value of public procurement, in legal terms, shows that in the Finnish estimate the traditional tendering procedure (Kivistö & Virolainen 2019) covers 66% of the value of public procurement. Under-threshold value procurement can also be covered by the normal scope of procurement. The large volume of in-house and other government-to-government procurement can have steering mechanisms outside the traditional economic and management silo. Therefore, public procurement is viewed across several scientific silos. Current conferences (International Public Procurement Conference) or symposiums (Interdisciplinary Symposium on Public Procurement) also recognize the economic/managerial and legal disciplines.

Peer-reviewed scientific articles are traditionally used in literature reviews.

There are other types of knowledge presented in the so-called gray literature. For this thesis, the following types of gray literature were used:

- 1) case studies
- 2) conference papers
- 3) doctoral theses
- 4) government documents
- 5) legislation
- 6) policy documents
- 7) policy statements
- 8) annual reports
- 9) government reports (also documents from multinational government bodies such as the United Nations (UN), International Monetary Fund (IMF), World Bank, and The Organization for Economic Co-operation and Development (OECD))
- 10) standards
- 11) statistics

The use of gray literature should consider the possible points of emphasis from each source. A report made or commissioned by a governmental small business administration is likely to have an emphasis that promotes business with SMEs as beneficial. Sustainability reports are usually made by media personnel trying to portray the organization in a positive way. Innovation-promoting organizations may seek to prove their influence by showing a list of projects they engaged in when they were in an early stage of development. From an ontological point of view, the gray literature used for this thesis did not cause a reliability problem, when the potential emphasis was considered.

Literature reviews (LR) on the topic of public procurement have been presented at international conferences and in business and management journals. Other LRs have focused on public-private partnerships, as presented in construction and public

administration journals. Each of these made a step forward. However, there is no comprehensive view of PP across disciplines. This LR involves two legal journals as well as an exploratory LR focused on health and social management journals. It reveals different terminology used for PP across disciplines and it identifies six scientific silos and various future research directions.

Some LRs are related to public procurement, with systematic LRs focusing on articles from the *Journal of Public Procurement* (JoPP) (Flynn & Davis 2014; Patrucco, et al., 2017) and of those by Lange, et al. (2014), using the search words *public/government and purchasing, procurement, contracting, and commissioning*. Patrucco et al. (2017) mentioned that there are “academic works...limited to a specific aspect (legal, e.g. *Public Procurement Law Review (PPLR)*; or administrative, e.g. *Journal of Public Budgeting, Accounting and Financial Management*).” These LRs are limited to one journal (JoPP) or to the use of the words *purchasing, procurement*, or something similar. Mature research fields are characterized by exploration of a variety of topics and applications of complementary research methods (Patrucco et al., 2017; originally Cheon, et al., 1993). Therefore, the publications limited to a specific aspect should be addressed as well.

Public procurement may not always fall under the words *purchasing* or *procurement*. Ke et al. (2009) and Wang, et al., (2018) conducted LRs on public-private partnerships (PPPs). Ke et al. used construction management journals and Wang et al. (2018) used public administration journals. The main topic in both of these was PPP. The public administration journal may have used keywords like *purchaser-provider split, quasi-markets, commissioning, and vouchers*, but it was likely not limited to those. Procurements from publicly-owned corporations usually fall under the concept of corporate governance (Farneti, et al., 2010). In order to capture a comprehensive view of public procurement, a number of other words should be recognized.

Spina, et al. (2013) conducted a literature review on purchasing and supply management (PSM) using 20 respectable journals covering supply chain management, operations management, and management in general. As this LR is of general nature it also can contain research on PP. It also shows the percentages of PSM contents in journals with a broader management content. The SCM journals had PSM as a topic in 47% of the articles from 2002 to 2010; in operations management the respective figure was 9%; and for general management it was 4%. Individual journals reached a 15% share of PSM articles out of the total number from *Industrial Marketing Management* and 11% from *Decision Science*.

Lange et al. (2014) presented a literature review of public procurement for the years 1997 through 2012. The articles were obtained from two databases (Scopus® and Web of Science™) and were restricted to peer-reviewed articles in the social sciences, published in English. Search words included two versions of *public* (*public* and *government*) and several words meaning *purchasing* (*procurement, purchasing, contracting, buying, and commissioning*). The classification framework was adapted from Wynstra (2010).

Flynn and Davis (2014) reviewed articles published in the *Journal of Public Procurement* in the years 2001 to 2013. Their focus was, among other things, the theoretical bases for the articles and also research foci. They classified facets of theoretical grounding into four groups: economics, sociology, management, and psychology. Altogether, they found 50 different theories with research foci classified among three groups: individual, organizational, and macro-perspective (regulations and policies).

Patrucco et al. (2017) wrote a content analysis on the articles in the *Journal of Public Procurement* (2001 to 2014). The analysis categorized the types of public institutions (government: 60; local/municipal: 19; and no specified government level: 128), category scope (defense: 21 of 61 articles; health: 9 of 61; and social care and welfare: 0 of 61). The content analysis was further categorized with seven sub-categories from which the most important components were goals (122 articles), processes (119 articles), performance (122 articles), and environment (91 articles).

Ke et al. (2009) looked at 170 articles concerning PPPs in seven construction journals. PPP articles accounted for 4% of the total. The writers identified seven major research interests: (1) investment environments, (2) procurements, (3) economics viability, (4) financial packages, (5) risk management, (6) governance issues, and (7) integration research. Wang et al. (2018) followed the idea of Ke (2009) and analyzed PPP in public administration journals. They identified 186 articles in 56 journals. The monetary scope was limited to PPP, so many other categories of public procurement were not covered. The article addressed 17 different theories upon which the articles were based.

Prier and McCue (2009) mentioned US legal journals such as the *Public Contract Law Journal*, *Contract Management*, and *Acquisition Review Quarterly*. In Europe there are two major legal publications: *Public Procurement Law Review* and *European Procurement and Public Private Partnership Law Review* (EPPPL). These legal publications are not included in Scopus or the Web of Science.

In addition to these literature reviews, there are those whose focus is on procurement in the areas of public governance, the governance of outsourcing, and contractual relationships (Farneti et al., 2010). One of the frameworks for public governance (Table 3) was presented by Considine and Lewis (2003).

Table 3. Governance Models by Considine and Lewis (2003)

Model	Source of Rationality	Form of Control	Primary Virtue	Service Delivery Focus
Procedural governance	Law	Rules	Reliability	Universal treatments
Corporate governance	Management	Plans	Goal-driven	Targets
Market governance	Competition	Contracts	Cost-driven	Prices
Network governance	Relationships	Co-production	Flexibility	Brokerage

In the article by Considine and Lewis (2003), neither purchasing nor procurement were mentioned: “Some countries...introduced forms of public organization in which a ‘quasi market’ takes the place of traditional forms of coordination (market governance)...This new ideal of network governance is thus a form of organization in which clients, suppliers, and producers are linked together as co-producers (network governance).” All these governance models can contain procurement if the supplier is a separate entity and the public entity is paying for the service based on a transaction (no transfer payment). This article is an example of how procurement can be presented under words other than procurement, purchasing, or contracting. Another framework was provided by Kirkman-Liff et al. (1997). These authors classified the purchaser-provider contracting relationship into six categories: (1) command-and-control systems; (2) administered price systems; (3) collaborative planning; (4) regulated negotiations; (5) decentralized administration; and (6) market competition.

The literature reviews of Lange et al. (2014), Flynn and Davis (2014), and Patrucco et al. (2017) are restricted to the social sciences. Some of the process issues and e-procurements have both commercial and legal lenses. The analysis of category scope reveals bias, as defense is overrepresented while social and healthcare concerns are underrepresented. That may be caused by the large share of US authors, as defense is a major category in federal procurements and the major part of healthcare is not provided by public entities. While the *Journal of Public Procurement* is multidisciplinary, it can incorporate legal matters as well, but they are not clearly visible in literature reviews. The review by Lange et al. (2014) includes multiple journals in social sciences. However, it does not cover the health sciences in Scopus or the Web of Science. Also, the purchasing issues are expressed in other words in different scientific silos, such as *purchaser-provider models* or *vouchers* as examples. These types of purchasing models are used in social sciences and healthcare (usually in government-to-government transactions) as well as private and third-sector organizations.

Lange et al. have reviewed 378 articles (1997 to 2012), of which eight are from the *Journal of Public Procurement (JoPP)*. Patrucco et al. analyzed 231 research outputs (2001 to 2014) in JoPP; altogether 601 are non-overlapping items in social sciences. Lange et al. (2014) mentioned 10 top journals in which the number of contributions were 88, excluding those from the *Journal of Public Procurement*. To make a comparison to Lange et al. and Patrucco et al., 16 years of *PPLR* (2002-2017) consist of 299 articles including literature reviews. *European Procurement & Public Private Partnership Law Review* has been published since 2006 and offers 267 articles (2006-2017). Comparing the figures of Ke et al. (2009) and Wang et al. (2018), the article numbers by Lange et al. (2014) seem to be low. Health and social care management journals are more general, but derived from the figures by Spina et al. (2013) they are likely to yield 2% to 15% of the number of the articles concerning procurement. The comparison of Literature Reviews in PSM and PP is presented in Table 4.

Table 4. Comparison of Literature Reviews in PSM and PP

	Wynstra	Spina, et al.	Lange, et al.	Flynn and Davis	Patrucco, et al.	Ke, et al.	Wang, et al.
Year	2010	2013	2014	2014	2017	2009	2018
Scope	PSM	PSM	Public proc	Public proc	Public proc	PPP	PPP
Journals	1 (JPSM)	20	199	1 (JoPP)	1 (JoPP)	7	56
Articles	351	1055	378	172	231	170	186
Science scope	PSM	PSM	PP	PP	PP	PPP Constr uction	PPP Public Adm

According to the methodology used by Patrucco et al. (2017), a literature review consists of four steps: (1) source identification, (2) source selection, (3) source evaluation, and (4) data analysis. In a literature review across disciplines there is a need to recognize the different scientific silos affecting public procurement. The silos can be selected by identifying the educational background of the people working with public procurement. There are public administration, legal, education, health, social work, engineering, information system, military, and commercially-educated professionals. The other source for identification is classification of the monetary value of public procurement (Kivistö and Virolainen, 2019).

Spina et al. (2013) used a method of selecting the top peer-reviewed journals in PSM, marketing, and management to look for articles focused on purchasing and supply management. There was no identification as to whether the purchasing was public or private. In the LR by Lange et al. (2014), the authors also made a choice to exclude gray literature.

In this thesis the exploratory source selection was made selecting top journals in the disciplines not covered by literature reviews, namely health and social work and legal sciences. The choice of using top journals was also due to the fact that procurement can be called by other words or described under governance models.

For health and social sciences the library database was used with the search words *purchasing*, *procurement*, *buying*, and *contract*, as well as words used in public organizations: *purchaser-provider*, *commissioning*, and *voucher*. From these searches two major publications were identified: *Health Policy* and the *British Journal of Social Work*. Later, a decision was made as to whether the article topic was about public procurement (i.e., the purchaser was a public entity or the article discussed transactions of services or materials). For examination of articles in the legal sciences, the choice was to review two European journals focused on public procurement: *PPLR* and *EPPPL*. Both journals have several kinds of content: (1) editorials, (2) articles, (3) book reviews, (4) news and analysis, (5) country reports, and (6) case law. From these content categories only articles on case law were analyzed; 77 were found in *PPLR* (2013-2017) and 80 were found in *EPPPL* (2015-2017).

For data analysis the classification framework of Patrucco et al. (2017) was used. For other silos additional classification topics have been created. In order to achieve compatibility with the work of Patrucco et al. (2017), the same type of classification framework was used in table 5. However, it was amended with more choices for legal classification. Also, the public spend (Kivistö and Virolainen, 2019) affected some values in certain variables.

Table 5. Classification Framework Used by Patrucco et al. (2017)

Variables	Values
Methodology	Literature review, case study, survey, simulation, experiment, Delphi, collaborative research, conceptual
Type of research approach	Exploratory, theory building, theory testing theoretical, empirical
Unit of analysis (public institution)	Central government, local government, public corporation owned by general government, international organization, type of country
Unit of analysis (purchase type)	Professional services, defense, social care, transport and facility management, environment, construction and public works, health, ICT and indirect, education
PP strategy content	(Supply environment), political strategies, make-or-buy-decision, general functional strategies, supply chain design strategy, category strategy, awarding strategies, process strategies
PP strategic goals	Commercial goals (efficiency, effectiveness), regulatory goals (transparency, corruption, compliance), socioeconomic goals (GPP, SRPP, local economy, competition and fairness)
PP processes	Budget and demand management, definition of requirements, supplier scouting, bid design/supplier selection, negotiation and awarding, contract management, order management, SRM, vendor rating
PP tools & procedures	Spend analysis, e-procurement, cooperative contracts, reporting, benchmarking, risk management, public private partnerships
PP organization	Macro-structure (level of centralization organizational design), micro-structure (competencies, training program, resource specialization, knowledge management, behavior/trust, corruption, cross-functionality)
PP environment	Procurement regulation, government regulation, procurement reforms, government reforms, political/government implication, legal environment
PP performance	Cost, quality, time, innovation, compliance, sustainability

Health and social care are another division in literature databases. For those articles, the classification framework in Table 6 was used. Additionally, pharmacology was classified as belonging to the life sciences.

Table 6. Classification Framework for Health and Social Care

Variables	Values
Unit of analysis (purchase type)	Professional services, equipment, facilities, primary care, secondary care, social services, pharmaceuticals, materials
PP strategy content	(Supply environment), political strategies, make-or-buy-decision, general functional strategies, supply chain design strategy, category strategy, awarding strategies, process strategies
PP strategic goals	Commercial goals (efficiency, effectiveness), regulatory goals (transparency, corruption, compliance), socioeconomic goals (GPP, SRPP, local economy, competition and fairness), freedom of choice
PP processes	Budget and demand management, definition of requirements, supplier scouting, pricing models, bid design/supplier selection, negotiation and awarding, contract management, order management, SRM, vendor rating
PP tools & procedures	Spend analysis, e-procurement, cooperative contracts, reporting, benchmarking, risk management, public private partnerships, vouchers
PP organization	Macro-structure (level of centralization organizational design), micro-structure (competencies, training program, resource specialization, knowledge management, behavior/trust, corruption, cross-functionality)
PP environment	Procurement regulation, government regulation, procurement reforms, government reforms, political/government implication, legal environment
PP performance	Cost, quality, time, innovation, compliance, sustainability

For classification of the legal journals there is a further classification. Multiple case studies can be classified as comparative law. There is also a narrative pattern of legal dogmatics which pertains to a particular law or regulation in relation to references. That

type does not exist in the social sciences. Instead, this publication reflects the use of four categories for classification as described in Table 7.

Table 7. Classification Framework for Legal Articles

Variables	Values
Unit of analysis (legal type)	EU (classical, utility, defense, in-house, other G2G, outside directives), US, UNCITRAL, GPA, other
PP strategic goals	Commercial goals (efficiency, effectiveness), regulatory goals (transparency, corruption, compliance), socioeconomic goals (GPP, SRPP, local economy, competition and fairness)
PP legal procedures	EU (open, restricted, negotiation, competitive dialogue, innovation partnership, framework agreements, joint procurement, e-auction, DPS, electronic catalogues, direct purchase), advertising, remedy, debarment, other
PP environment	Procurement regulation, government regulation, procurement reforms, government reforms, political/government implication, legal environment

The Health and Social Care View

The literature review on health and social care consists of nine articles from the *British Journal of Social Work* and 18 from *Health Policy*. The unit of analysis covers every other type of purchase except materials. The greatest number is concerned with health services as a whole, as the authors of many articles discussed national health reforms. This reveals a rising concept in PP in which individuals are using their freedom of choice. In articles on both health and social care scholars discussed this (Arksey and Baxter, 2012; Chester et al., 2010). This extends the meaning of *make-or-buy analysis* from an organizational view to letting individuals make choices at the expense of the public entity by using vouchers of pre-defined services, or individual budgets, by which each citizen can decide what kind of services to use. The strategy could be called *make/buy* or *let buy*. The other strategy issues that were noted were the absence of category strategy of professional services (Penno and Gauld, 2017) and the supply chain design strategy (Hellowell, 2013).

General PP strategic goals are classified the same way as Patrucco et al. (2017) classified them. Commercial goals were mentioned 14 times; transparency once (Brammli-Greenberg et al., 2016) and sustainability once (Evans et al., 2012); and competition four times, usually as a means for getting better pricing. Other types of public requirements were found such as freedom of choice, self-determination, and preventive care, among

others. These could be called *functional goals*. Klasa et al., (2018) identified similar types of functional goals in health: population health and citizen empowerment (assert citizens' views/values, enforce purchaser accountability, and increase citizen choice).

Public procurement processes were widely spread. Pricing models were the most frequently discussed topic (eight articles) and these were mostly in healthcare, including diagnostic related groups (DRGs), the Israeli procedure related groups (PRGs) model (Brammli-Greenberg et al., 2016), and salary type compensation for general practitioners (GPs). Pricing models also covered elements limiting the public spend (Siciliani et al., 2017). A definition of requirements was emphasized in social services, particularly in the cases of individual budgets (Cambridge et al., 2005, Chester et al., 2010). Bid design was mentioned three times, allowing competition (Curto et al., 2014) or paying for outcomes (Steenhuis et al., 2017). One peculiarity is that the buyer-supplier relationship was called *inter-sector commissioning* (Sellick, 2006). This is one example of different scientific silos using different words.

PP tools and procedures played a minor role. Additions to the framework were vouchers and individual budgets (Arksey and Baxter, 2012). PP organization was lacking competencies mentioned in relation with a definition of requirements and contracting from the market by social workers. Also, the use of personal budgets as a new instrument was mentioned as a training need (Priestley et al., 2007). The *public procurement environment* was referred to five times, with all instances relating to government reforms, either specific to healthcare or to the introduction of new instruments (individual budgets) for social care (Arksey and Baxter, 2012).

The Legal View

The literature review of 77 articles in *Public Procurement Law Review* and 80 articles in *European Procurement & Public Private Law Review* were restricted to legal type, strategic goals, PP legal procedures, and PP environment. The legal type is dominated by the European Union directives. Of the 157 articles, 106 dealt with legal issues inside the Union; eight were related to the World Trade Organization's Agreement on Government Procurement (GPA) (Gao, 2013 [as a new entrant]; Yukins, 2017 [as a Brexit alternative]; Wang, 2017); 23 addressed national legal frameworks outside the EU; and seven were related to the procurement rules of international organizations (Gorski, 2016; Borson, 2017). Within the EU the majority (30) dealt with detailed issues of directives; four dealt with utility and defense directives. The remaining 28 articles discussed issues of the boundaries of EU directives, in-house procurements (Pedersen and Olsson, 2013; Al-Tabbaa, 2016; Panasiuk and Jarocki, 2017), government-to-government cooperation (Wiggen, 2014; Ippolito, 2014), and interaction with other laws (Nielsen, 2017). Also, various free trade areas were discussed (Raczkiwicz, 2016; Andersson and Pelletier, 2016; Yukins, 2017).

Public procurement strategic goals were mentioned in 42 articles. Eighteen articles were concerned with regulatory issues (mainly corruption) (La Chimia and Valaguzza, 2017; Dubois et al., 2016) and collusive tendering (Arden, 2013). Transparency was also

mentioned (de Quesada, 2014). Twenty-one articles examined socioeconomic goals (mainly social responsibility) in a special issue of *EPPPL* (3/17), SME policies (Flynn et al., 2013; Kidalov and Snider, 2013; Gao, 2013) and green public procurement (Kunzlik, 2013).

Legal procedures were discussed in 51 articles. The first category was named *procurement procedures*, concentrating on how to conduct public procurement using innovation partnership (Andrecka, 2015a; Gomes, 2014), e-procurement (Bickerstaff, 2014), framework agreements (Arden, 2013; Hamer, 2014; Andrecka, 2015b), dynamic purchasing systems (Eyo, 2017; Oliveira, 2017), and other procedures. The second category focused on remedies (Trybus, 2013; Reich and Shabat, 2014), debarment (Schoenmakers, 2016; Dubois, et al. 2016) and ineffectiveness (Halonon, 2015). The third group discussed other issues such as substantial changes (Hartlev and Liljenbøl, 2013; Brodec and Janeček, 2015), contract modification (Garcia-Andrade, 2015; Olivera, 2015) and the obligation to retender (Treumer, 2014), contract termination (Halonon, 2017), and other exceptional transactions.

Public procurement environment topics were described in 17 articles, of which 11 discussed procurement regulations (Arrowsmith, 2017; Wang, 2017; Yukins, 2017); seven discussed procurement reforms (Gorski, 2016; Skugor, 2017) and public financial corporations (Trepte, 2016; Sharma, 2016; von Lindeiner, 2016).

Economics and management are covered by literature reviews (Lange et al., 2014; Patrucco et al., 2017). The top 10 journals identified by Lange et al. are presented in table 8.

Table 8. Top 10 Journals Identified by Lange et al. (2014)

<i>Journal of Purchasing and Supply Chain Management</i>
<i>Public Administration</i> *
<i>Public Administration Review</i> *
<i>Australian Journal of Public Administration</i> *
<i>International Journal of Public Sector Management</i>
<i>Journal of Construction Engineering and Management</i> **
<i>International Journal of Industrial Organization</i>
<i>Journal of Public Procurement</i>
<i>Public Money & Management</i> ***
<i>International Journal of Project Management</i> **

Note. *=common with Wang; **=common with Ke; ***=common with Wang and Ke.

Public administration and politics was introduced as a scientific discipline by Wang et al.(Table 9), but their scope was limited to public-private partnerships. With knowledge of the journals related to PPP, the literature review could be expanded to cover other words describing public procurement. However, in the public administration discipline

an additional approach should be made by a cross-disciplinary group of researchers looking at the phenomena of public procurement under the concept of governance models.

Table 9. Top 20 Public Administration Journals Identified by Wang et al. (2018)

<i>Public Administration</i> *
<i>Public Administration Review</i> *
<i>Australian Journal of Public Administration</i> *
<i>Public Money & Management</i> ***
<i>Public Performance and Management Review</i>
<i>Public Management Review</i>
<i>Local Government Studies</i>
<i>Canadian Public Administration</i>
<i>International Review of Administrative Sciences</i>
<i>Environment and Planning C: Government and Policy</i>
<i>Public Administration and Development</i>
<i>Lex Localis - Journal of Local Self-Government</i>
<i>Policy and Politics</i>
<i>International Public Management Journal</i>
<i>Policy and Society</i>
<i>Journal of Comparative Policy Analysis</i>
<i>Transylvanian Review of Administrative Sciences</i>
<i>Administration & Society</i>
<i>Policy Sciences</i>
<i>Policy Study</i>
<i>Studies in American Political Development</i>
<i>Social Policy Administration</i>

Note. *=common with Lange; ***=common with Lange and Ke

In addition to the general views of public procurement, there is a need to identify branch-specific journals, such as health and social care, which examine the policy and management levels. In these branches the services are procured to individual citizens, whereas normal public procurement provides materials and services to public entities.

The health and social care view identify functional goals, processes, and procedures. Functional goals cover such issues as self-determination and freedom of choice. The procurement environment was often regulated or contracted between public entities. However, from the purchasing maturity view they are on a low level of maturity. As Klasa et al. (2018) frankly coined, "None of the 10 health care systems purchased strategically by any definition."

Aside from the branch-specific analysis, there is a need for category-type analysis. Construction for infrastructure and real estate has its own logic. Ke et al. (2009) made an analysis of PPP projects (Table 10), but other types of construction need to be assessed. Another type of category analysis should be made to include Information and Communication Technology (ICT) and general technology, in which there are common category characteristics regardless of the area in which they are used. The categories are also significant innovation enablers.

Table 10. Top 7 Architecture And Construction Management Journals Chosen by Ke et al. (2009)

<i>Journal of Construction Engineering and Management</i> **
<i>Public Money & Management</i> ***
<i>International Journal of Project Management</i> **
<i>Construction Management and Economics</i>
<i>Journal of Management in Engineering</i>
<i>Proceedings of the ICE Civil Engineering</i>
<i>Engineering, Construction and Architectural Management</i>

Note. **=common with Lange; ***=common with Lange and Wang

Theories behind the research were analyzed in two literature reviews: Flynn and Davis found 26 different theories; Wang et al. found 17. Four of these were the same. Ke et al. did not mention any. The topics were different in the literature reviews, as Ke et al. addressed investment environments, procurements, economics viability, financial packages, risk management, governance issues, and integration research. Wang et al. recognized four issues: (1) complex and durable cooperation between public and private sectors; (2) risks; (3) enabling factors; and (4) the assertion that PPP performance should be seen as a network performance. Legal sciences are a separate lens in public procurement. Most of the articles had a common view based on laws or evaluations of the regulations. Instead of economic efficiency, the more interesting topic was competition and transparency. The common area was procurement regulations and reforms, strategic goals, and some procedures like e-procurements, etc.

This chapter shed light on public procurement by adding multiple lenses of the discipline. These lenses are health and social care along with legal aspects. This chapter also revealed the limitations of the existing literature reviews. In public administration and in health and social care, public procurement is expressed using other words. The best hits were with *purchaser-provider* and *commissioning*. It seems that concentrating on top journals is likely to produce a more comprehensive view of public procurement and the other words by which it is called.

The limitations of this chapter in the legal lens are that there are no journals covering commercial law or the role of contract writing by the public entities. The chosen journals cover mostly European legislation; the specialized US journals were not covered. Since

this is an exploratory view of PP literature, it has not covered every type of category view or entity type view. Also, the LR represents peer-reviewed journals, which leaves books, conference papers, and other types of gray literature unaddressed.

There is still a need for multidisciplinary research. Wynstra (2010) mentioned that “the journal (of *Purchasing and Supply Management*) is clearly positioned as a multidisciplinary journal with ties not only to operations management but also to the marketing discipline.” However, this publication suggests there is also a need to look in a multidisciplinary fashion across the disciplines or scientific silos.

The engineering management silo should contain construction, computer science, and innovation journals. Ke et al. (2009) already recognized the top construction journals but the scope should be expanded to all public procurement. The list of economics journals should be revised from the lists of Spina et al. (2011) and Lange et al. (2014). Wang et al. (2018) pointed out the most significant public administration journals but the scope should be expanded to include all public procurement; it should identify the other words under governance models. Other public services can contain management of other types of public services than social and health care. The different silos are presented in Table 11. Much of the discussion can be category specific—construction, computer science, and innovation.

Table 11. The Silo View of PP

Public Procurement					
Engineering management	Economics and management	Public administration and politics	Health and social care management	Other public service management	Legal

Another direction would be the use of political economics to broaden the view in defining which public requirements should be pursued in the commissioning phase (Myerson, 2017). These views emphasize the performance view of PP, even though in these disciplines the discussion is conducted based on other terms. The different types of political economics include health economics (Gu, et al., 2011) and ecological and environmental economics (Hoepner, et al., 2012), among others. This approach is presented in Table 12.

Table 12. The Different Views of Political Economics

Evaluation of Interventions			
Political economics	Health economics	Environmental economics	Other political economics

2.2. Procurement processes and tools

2.2.1. Procurement processes in general

Procurement processes were one of the most frequently discussed topics in the study of Patrucco et al. (2017). Additionally, several other topics could be turned into processes. Although the topic classification is an outcome, such as a strategy or performance, the article itself can contain processes. Procurement processes of public authorities were also analyzed by McCue and Gianakis (2001) on multiple levels of public administration. The authors developed a comprehensive repository of processes on operational, tactical, and management levels. From the community benefit view, the legal preferential program for minority and women-owned businesses was among those mentioned as a process. The same kind of procurement process repository can be found in a textbook by Thai (2007) which also discussed social and environmental objectives. However, the elaboration does not provide processes or tools. Rendon (2008) added to this discussion by introducing a contract management maturity model in which the procurement process was analyzed under the construct of contract management.

General procurement process developments have been discussed in several papers. Heijboer and Telgen (2002) compared the efficiency of open and restricted procedures. Bartle and Korosec (2003) conducted a review on state procurements and contract management. They identified preferential programs for suppliers in the state. Novak et al. (2004) introduced the Evolutionary Acquisition for Air Force technology procurement as a process example for innovative procurement. Randall et al. (2004) elaborated make-or-buy decision for commercial activities (CA) in public services and developed evaluation metrics for outsourced services. Basheka (2008) evaluated procurement planning processes in local governments of Uganda. Cox et al. (2005) highlighted demand management in healthcare and recognized the different levels of tactical and strategic sourcing. In a more recent paper by Apte et al. (2019), the authors claimed an aspiration to develop category management for services. Lean processes for sourcing were introduced in the work of Waterman and McCue (2012). Sebastian and Davison (2011) looked at contract administration from a risk management perspective. The authors recognized several tools in writing requests for proposals (RFP) and contracts along with root causes for contract administration problems. Smirnova et al. (2016) investigated performance measurement in transit industries (public transport) and introduced measurement tools, focusing on core performance measures, not including sustainability.

General frameworks as tools for public procurement was presented by Arrowsmith (2010) and (Kivistö and Virolainen 2019). Arrowsmith's taxonomy (2010) introduced mechanisms for implementing horizontal policies: (1) the decision to purchase or not to purchase; (2) the decision of what to purchase; (3) contract conditions laid down by the purchaser; (4) the packaging and timing of orders; (5) set-asides; (6) exclusions from contracts for non-compliance with government policies; (7) preferences in inviting firms to tender; (8) awards criteria; and (9) measures for improving access to government contracts. The public procurement legal framework (Kivistö and Virolainen, 2019)

recognizes different parts of procurement in EU-context: inside directives, government-to-government procurements, outside directives, and small procurements. Also, the institutional type categorization can be of use to (1) central governments, (2) municipalities, (3) joint municipalities, (4) corporations owned by central governments, (5) corporations owned by municipalities, (6) corporations owned by joint municipalities, (7) utilities, and (8) others.

2.2.2. Green public procurement

The first dimension of community benefits is green public procurement (GPP), the term used in Europe. The same issue in US is called environmentally preferable purchasing (EPP). In the private sector Tate et al. (2012) call it environmental purchasing and supply management (EPSM).

Green public procurement in the view of buyer behavior was analyzed by Igarashi et al. (2017). The authors identified 12 personal working patterns for GPP such as, (1) “I look at what we have had in previous similar projects and update what should be changed,” (9) “I ask a product expert on our project team to give advice,” or (12) “I look at the environmental criteria recommended by Difi (Norwegian procurement unit) or the EU guidelines.” The authors categorized their information search in three parts: (1) within the procurement organization (example 1); (2) within their own organization (example 9); and (c) externally (example 12). Their study is a good example of individual behaviors of the buyer. However, there was no particular identification of what kind of information was sought.

Cogburn and Rahm (2005) looked the same issue with the term *environmentally preferable purchasing* (EPP). Out of processes and tools the authors recommended price preferences, green specifications, the best value or life-cycle cost approach in bid evaluation, EPP goals, green teams within an organization, cooperative green specifications, and cooperative agreements. Smith and Terman (2016) identified EPP indicators such as EPP policy, EPP considerations in RFP, and environmental preference communicated to suppliers. Nijboer et al. (2017) investigated cross-country learning on GPP and innovation. The major conclusion was that either it was not searched for or there was no evidence for it in the developed countries, whereas in developing countries it was utilized.

Buying Green, third edition (European Community, 2016) is part of the gray literature. This practical guide introduced several processes and tools for GPP:

- (1) GPP policy (p. 10) on the strategy level in which the authors also elaborated on target setting (p. 11-12);
- (2) GPP monitoring (on the management level) which emphasized coding tenders/contracts to which GPP has been applied and what kind of environmental impact has been realized;

- (3) consulting with the market (on category management level) which was described as advisable;
- (4) drafting environmental technical specifications (process) to use standards or performance-based specifications (tools) and to allow for alternative technical applications;
- (5) drafting material or process specifications (process) and allowing, for example, remanufactured or recycled materials and specifying non-wanted materials or production methods;
- (6) using variants (tool);
- (7) using EU GPP criteria and labels (tools);
- (8) using tools to verify technical compliance;
- (9) defining selection criteria, focusing on personnel or enterprise capacities;
- (10) using award criteria, either in a pre-defined scale (quality points) or in the form of a calculation formula (pricing), like life-cycle costing that includes costs for the procuring unit or incorporating external costs for emissions (tool);
- (11) using contract performance clauses, which can have the same kinds of requirements as those stated in specifications; and
- (12) monitoring contract compliance during the contract time.

Individual tools include life cycle costing (LCC) and energy performance contracts (EPCs). Standard procurement procedures are also discussed (joint procurement, framework agreements and procurement procedures).

The text—at 80 pages—demonstrates that tools and processes require significant explanation, which is unlikely to be published in full in academic journals. However, individual items such as life-cycle costing can be addressed in academic journals. Additionally, the 12 individual points demonstrate the commercial and legal details to be drafted in RFP and contract documents.

For GPP, there are guidelines provided by the European Commission for 20 product and service categories (European Commission, EU GPP criteria). Procurers can also use the requirements of environmental labels, which specify products and their environmental performance in a more detailed level. For those products outside EU GPP criteria (European Commission) and for social criteria, one can use the frameworks provided by the Global Reporting Initiative (GRI) and standards such as ISO 26000 (International Organization for Standardization, 2010). GRI 2016 breaks down the sustainability into 30 environmental dimensions (such as CO₂ emissions), 40 social dimensions (such as freedom of association), and 13 economic dimensions (such as anti-corruption). ISO 26000 addresses the same issues with some variation, but they are classified differently. The environmental aspects can be defined as requirements, whereas the social and economic aspects are more likely to be in codes of conduct and thus in qualification criteria. All GRI dimensions can be viewed internationally, such as in the environment (CO₂-emissions) and as existing locally (nitrogen oxide (NO_x), Sulphur oxide (SO_x), and other air emissions). In the social dimension the international view could be related to

child labor, but locally, it could be related to consumer health and safety and designing the products and services for vulnerable groups.

There are also a number of third-party organizations offering sustainability-related services, collected by the International Trade Center, covering either social, social and environmental, or triple bottom-line services. These third-party organizations may serve multiple industries but they are usually focused on consumer goods or single products like coffee. These services make the qualification easier and more reliable in the view of non-governmental organizations (NGOs).

From the processes and tools perspective, the discussion and guidelines are focused on the sourcing process. GPP specifications can be supported by EU GPP criteria and environmental labels criteria. Monitoring is recognized in many sources. However, supplier development is raised by Tate et al. (2010), as the process is used more often in the private sector with longer supplier relations.

2.2.3. Public procurement of Innovations

The second dimension of community benefits is public procurement of innovations (PPoI). It is interesting for government innovation policy, because of the enterprise impacts, mainly gross national product (GNP) growth. Valovirta et al. (2017, p. 35) suggested a new definition for innovative public procurements: “Innovative public procurement is a procurement of new or significantly improved goods or services, which enhance the efficiency, quality or sustainability and/or impact of public services.” This definition highlights the impact to public services, whereas the innovation policy view emphasizes the enterprise impacts.

Scholarly discussions on PPoI seem to follow different streams of thought depending on what is procured. One stream is involved with construction and technology (both equipment and ICT). The other involves procurement processes and the finding of success factors. A specific point of interest is early contractor (supplier) involvement (ECI)

ECI as a process to facilitate innovation was discussed by some scholars. Lenferink et al. (2017) looked at ECI in the road building environment that allows contractors to participate in earlier stages, which can affect the route decision. Wondimu et al. (2018) offered a good literature review and looked at ECI in Norwegian bridge projects. The authors identified 16 ECI approaches, categorized as (1) specific to construction, such as with Building Information Systems (BISs); (2) legal procedures such as negotiated procedures; (3) contract templates such as PPPs; and (4) commercial concepts such as cost-led procurements. In addition, they identified various means of conducting ECI, such as with informal contacts and meetings as examples. They concluded that ECI is beneficial for innovations when applied early enough and at the right time in project phases, as well as in one-to-one discussions and group meetings. Koivisto (2018) elaborated on innovative procurements under the construct of co-designing an outcome-

based procurement. It was used for designing the operations in a social and healthcare station using a web-based communication tool.

The same phenomenon was also discussed using the term *conversations* (Uyarra et al., 2017) and linking it to regional development and innovation. This categorization was made along two axes: place dynamics (how local the conversation needs to be) and distance dynamics (how generic the conversation might be). The authors recognized the absence of tools for the market watching of existing innovations, i.e. innovations in the diffusion phase. Ongoing conversations among procurement entities and suppliers can generate a trusting environment. Along with concrete procurement, the conversations can lead to new, unsolicited ideas and proposals. The authors recognized the need for subcontracting when a global technology provider needs a local subcontractor to make the local service provision.

Suhonen et al. (2019) investigated contract terms from the view of risk-taking. They suggested more of a cost-plus approach than that of supplier risk-taking. Rainville (2016) classified innovation procurement entities into three categories: (1) large collaborative agencies; (2) supplier-focused pre-commercial procurers; and (3) direct procurers at the municipal level. The author found differences in knowledge-sourcing strategies from suppliers, users, and other governmental units. Direct procurers are municipal agencies; they adopt innovations from the market and purchase more “off-the-shelf” goods and services. Mwesiumo et al. (2019) developed a framework organizing the drivers, enablers, barriers, key success factors, pitfalls, and benefits of PPI. Of all the barriers that can be raised, lack of knowledge and resource constraints require more time. Eikelboom et al. (2018) looked at the decisive role of the individuals. Their sample was from one organization in which the invitation to participate in the study was addressed to 287 individuals. The majority of these people were non-procurement professionals, revealing the great extent of other people involved in procurement processes. The authors concluded that individual engagement is significant for innovations related to sustainable public procurement. Carbonara and Pellegrino (2018) investigated public-private partnerships from an innovation perspective. They summarized the contents of common PPP templates and emphasized (as a tool) bundling several services together instead of procuring unbundled services. Other tools involved contractual features like output-based contracts and repayment mechanisms.

Alhola and Nissinen (2018) analyzed 16 innovation procurement cases of clean technology. The case approach with the “how” question enabled them to recognize processes and tools.

The processes and tools that were revealed included:

- (1) Extensive market dialogue and market research
 - a. In comparison to other references this means knowledge sourcing and early supplier involvement.
- (2) Analysis of end user preferences and/or willingness to pay

- a. This reveals an additional dimension of plain user preference by adding willingness to pay, which is a construct familiar to environmental economics.
- (3) Sustainability and clean technology target setting as a performance-based requirement
- (4) Application of the lifecycle perspective in procurement planning, using that as the lifetime cost calculation involving equipment and energy costs
 - a. This could be enlarged to incorporate even the compensation cost of CO₂ emissions.
- (5) Selection of the procurement mode (e.g. service-product system instead of product)
 - a. In comparison to other references this means bundling services and products. It also highlights the role of second-tier suppliers.
- (6) Further development of services by end-user feedback and development with suppliers

From process and tools perspective there are several types available: general innovation frameworks, innovation sources, PP innovation frameworks and contract oriented frameworks.

General innovation frameworks

General innovation frameworks can be used as tools in developing specifications, either within the public entity or in collaboration with the suppliers. The frameworks could also be used as references in early supplier/constructor involvement.

The OECD's *Oslo Manual* (2005, p. 46) for measuring innovation presents **product**, **process**, **marketing**, and **organizational types of innovation**.

The Ten Types of Innovation (Keeley et al. 2013) framework is for business models and includes the (1) profit model, (2) network, (3) structure, (4) process, (5) product performance, (6) product system, (7) service, (8) channel, (9) brand, and (10) customer engagement. These are further described in terms of innovation tactics (Keeley et al. 2013, p. 144-147).

Innovation sources

The next framework is innovation sources. According to von Hippel (1988), innovations can be found from customers, competitors, or suppliers. Monckza et al. (2010) additionally recognized government research, universities, and other sources. Public units typically have no competitors, so the relevant term can be similar kinds of domestic or foreign organizations.

Public procurement of innovation frameworks

Hommen and Rolfstam (2009) presented a taxonomy with three dimensions for innovation. The first dimension is Modes of Interaction relevant to (1) directly addressing intrinsic needs (of the procuring organization); (2) cooperatively addressing congeneric needs (shared by the buyer and other organizations); and (3) extrinsic needs (actors other than the buyer's organization). The second dimension is Phases of Evolution, comprised of (1) the early phase (user-led innovation); (2) the middle phase; and (3) the late phase. The third dimension exemplifies the modes of interaction: (1) direct, (2) cooperative and (3) catalytic, and they are further elaborated with the first two dimensions.

Another framework is presented by Iossa et al (2018). They elaborate the use of different PP procedures for innovation procurement: pre-commercial procurement, procurement of innovative solutions and innovation partnerships. They also acknowledge market innovations, which could be started with a simple procurement of innovative solutions.

Valovirta et al. (2017) presented the innovation framework used in Sweden (Widmark, 2015). Figure 4 has been redrawn and developed from Widmark (2015). It illustrates recognition of the different developmental stages in the innovation process. In the early stages, public entities use universities, developmental services or traditional suppliers for innovation; in the later stages, suppliers are producing the actual products and services. Research and development can also be seen as led by indirect suppliers who do not deliver the actual innovation object. The new element introduced in this thesis is the acquisition of supply market research which enables joint procurement units offering international off-the-shelf innovations for decentralized procurement units. The acquisition of research and development could also be directed for innovations in the provision of public services with their own production. This approach conforms with the assertions of Monckza (2010).

				Acquisition of supply market research of innovations
		Development-promoting procurement		
	Procurement of new solutions			
Acquisition of research and development services				
				Proven product
			New, approved product	
		Test product		
	Prototype			
Concept				

Figure 4. Innovation procurement (redrawn and developed from Widmark [2015])

Suppliers can be further classified from the innovation point of view as follows (Kivistö et al., 2014):

- direct material suppliers;
- direct service suppliers;
- indirect equipment suppliers;
- indirect service suppliers (development and planning);
- machinery investment suppliers;
- construction investment planners;
- construction investment suppliers (complex product systems);
- second-tier suppliers; and
- a network of suppliers.

In procurement practice, there must also be a simple classification of low cost innovations (under threshold values) and large innovations. Iossa et al (2018) elaborated with the procurement procedures related to over threshold values, whereas with under threshold values the procedures can be less complicated. Procuring low-cost innovations, both new and in the diffusion phase, often require more costly work than that of the procurement volume. This is a problem for cooperative procurement entities working only on commission. For low cost innovations, customers should be prepared to pay for innovation procurement work. A possible solution for those might be to use a dynamic procurement system (DPS) of above threshold value and of direct orders under threshold value. DPS enables continuous supplier access to the procurement, but necessitates a minicompetition each case. For the user department direct orders from a framework agreement can be a more appealing choice. Both cases need administrative work by the procuring unit.

Valovirta et al. (2017) presented another innovation framework from the UK called The Forward Commitment Framework, introduced by Department of Business, Innovations, and Skills (BIS) as illustrated in Figure 5 (redrawn). One interesting part is recognizing problems, unmet needs, and opportunities. This can be developed into two different streams of category management: (1) clearly identified problems and unmet needs, and (2) broadly-expressed opportunities, which could be met by suppliers' suggestions or by internationally-available, off-the-shelf innovations. The other interesting part is market engagement and its scope, having to do with whether the public entity is satisfied with incumbent local suppliers or whether the market review is made internationally, either by its own work or by the use of a commercial research institute or consultants.

1. Identification	2. Market engagement	3. Procurement
Recognize problems, unmet needs, and opportunities	Market sounding	Develop a pro-innovation procurement strategy
Define an outcomes-based requirement	Market sounding review and analysis	Provide feedback to the supply chain and stakeholders
Prepare an FCP project outline/business case	Supply chain feedback	Implement procurement strategy
Approve project/sign off	Market consultation	Negotiate procurement contract
	Market consultation report	

Figure 5. Forward Commitment Framework (adapted from BIS 2011)

Suhonen et al. (2019) introduced a contract-oriented taxonomy for the public procurement of innovations. First, as innovation procurement modes there are ex-ante prizes, originally posited by Cabral et al. (2006) and Brutscher et al. (2009), have three categories: (1) research prizes, (2) research contests, and (3) innovative procurement contests. Second, as contractual tools, the contract types are divided into (1) explicit contracts, further on cost-plus (C+), fixed price (FP), and incentive contracts (IC), discussed by Laffont and Tirole (1993); and (2) implicit contracts, further divided into (2a) pre-contractual methods, (2b) within-contract methods, and (2c) post-contract methods.

Another innovative contract type is that of public-private partnerships. As adapted from Carbonara and Pellegrino (2018),

“The five common applicable PPP schemes are:

- (1) Operation-Maintenance (OM), where the private sector is responsible for all aspects of operation and maintenance.
- (2) Design-Build-Operate (DBO), where the private sector is responsible for the design, construction, operation, and maintenance of a project for a specified period prior to handling it over to the public sector.
- (3) Design-Build-Finance-Operate (DBFO), where the private sector is responsible for the finance, design, construction, operation, and maintenance of a project.
- (4) Build-Operate-Transfer (BOT), where the private sector is responsible for the finance, design, construction, operation, and maintenance of a project for a concession period. The asset is transferred back to the government at the end of concession period.

- (5) Build-Own-Operate (BOO), where the private sector retains the ownerships of the asset in perpetuity. The government only agrees to purchase the services produced for a fixed length of time.”

Another contract type, recently popular for large construction projects, is a project alliance. It was defined by Lahdenperä (2009, p. 13) in this way:

“Project alliance is a project delivery method based on a joint contract between the key actors to a project whereby the parties assume joint responsibility for the design and construction of the project to be implemented through a joint organization, and where the actors share both positive and negative risks related to the project and observe the principles of information accessibility in pursuing close cooperation.”

Lahdenperä further described the processes involved in launching a project alliance. The selection of actors consists of 17 steps. The author also introduced qualification and selection criteria (2009, p. 26-30). The description included the target cost calculation and determination of the payments to project parties (p. 31-57).

Valovirta et al. (2017, p. 109-113) suggested a broader concept for performance-based contracts. Instead of buying machinery or equipment, the invoicing basis is hours of operation. A separate concept is Environmental Performance-Based Contracting (EPBC) proposed by Bratt et al. (2013) and Douglas (2017); it was developed with eyes on diminishing the environmental impact. Other concepts include Whole Life Cost (WLC), looking at the lifecycle cost with equipment, energy costs, maintenance, and energy-efficient concepts (ESCO) in which the investor is paid by energy savings.

There is likely to be more discussion about PPP and the alliance model in the construction engineering silo, as indicated in chapter 2.1. Much of the discussion is related to infra-construction, although PPPs have also been used for buildings, referred to as lifecycle models. It is likely that an extensive literature review in construction, engineering, and ICT will reveal additional innovative approaches.

2.2.4. SME and local involvement

Qiao et al. (2009) investigated preferential procurement programs in the United States. They included several types: (1) typical minority-owned businesses, including those owned by racial minorities, women, and veterans; (2) SMEs; (3) locally owned or resident owned (either at the state or municipality level); (4) those set aside for disabled or sheltered work; (5) those related to buying green (recycled products); (6) drug-free workplaces; and (7) other types of preferences. These preferential programs are based on federal laws and policies which are enforced at the federal, state, county, and municipal levels.

In another study, Abutabenjeh et al. (2018) described the use of local preference programs in South Carolina (SC) in the US public procurement legislation network. There are five different preference programs: two end-product preferences for US-produced or SC-

produced end products and three preferences for resident suppliers or subcontractors. A third study was conducted by Jones (2011) having to do with social responsibility in the East Asian states. He classified preferential programs as those involving (1) SMEs; (2) venture firms; (3) environmental concerns; and (4) a dedication to ensuring work safety. Both developed and developing countries/areas have preferential programs for SMEs. The most advancing preferential program is in South Korea, involving set-asides, payment schedules, and financing against contracts. A special tool is a “multiple award schedule” (MAS) under which a firm is awarded a stand-by contract with product/service features clearly indicated and a competitively-determined unit price. Singapore and Hongkong, however, do not have a preferential program for SMEs; they shall have to compete with commercial terms with other companies.

European public procurement laws, by comparison, only offer preferential treatment for disabled or sheltered workers and businesses. The guidelines emphasize the inclusion of SMEs but there is no preferential program for that. Carmen Sanchez-Carreira et al. (2019) looked at the public procurement of innovation from a regional perspective. This approach is called *spatial aspects*, as discussed by Uyarra et al. (2017) among others.

Loader (2013, 2015) examined barriers to SMEs’ participation in public procurement. The author recognized qualification criteria that were too strict; imprecise tender specifications; and extreme resource requirements. SMEs may also lack appropriate resources for engaging in public biddings. On the other hand, mentoring programs and e-tendering software can encourage the participation of SMEs (McKevitt and Davis, 2015). Glas and Essig (2018) investigated SME success factors in a central government procurement unit. The authors found that dividing the procurement volume into smaller lots to encourage SME participation was not supported as a success factor, whereas open bidding and the number of bidders were supported as success factors. Another study was conducted in Canada, Hungary and Italy with a SME-friendly procurement (Ancarani et al 2019). The three countries chose to promote SME participation by streamlining the procurement process instead of using preferential treatment. Also, a more transparent information platform relevant to tendering opportunities (electronic markets) would enhance participation.

Promoting the procurement from local suppliers, procurement entities can use the framework described in Publication IV (Kivistö and Virolainen, 2017). Two types of local suppliers are recognized: (1) locally owned (independent) companies and (2) (dependent) enterprises having a local (resident) office in the municipality, either with a national origin (2a) or foreign origin (2b). This type of procurement has a core employment effect. It can be enhanced with requirements for apprenticeships and summer jobs.

The core employment effect can be further expanded to include vulnerable groups, placing it in the category of socially responsible procurements. For vulnerable groups, socially sustainable procurements can result in the offering of part-time jobs, work trials, and other types of employment.

Promoting competition is likely to increase the inclusion of SMEs and local suppliers as SMEs account for 99.8% of the number of enterprises in Finland (OSF1). Tools for promoting competition can be found in private purchasing literature under the construction of “*reverse marketing*,” providing a wider array of tools than the public procurement procedure called *market consultation*. This process is similar to that which requires early constructor(supplier) involvement, but that addresses removal of the barriers for SME participation. Applying category management to construction could reveal areas which could address different sizes of enterprises, especially microenterprises.

Market sounding, review, and consultation are good processes and tools for engaging the local and/or SME enterprises with public procurement. Some enterprises might want to work with their own business model, not corresponding to the public need.

2.2.5. Social aspects of public procurement

Although social aspects of public procurement were not mentioned in the papers, these aspects are present in sustainable public procurement.

A comprehensive view of the social dimension is presented in frameworks by the Global Reporting Initiative (GRI) and ISO 26000. Within GRI the social aspects are divided into labor practices, human rights, effect on the community and responsibility of the product. These views shall have to be investigated both in the market and in production facilities. Under the category of human rights are issues like child labor and forced labor, which can be present in the production facilities in Asia or the European Union. To safeguard the social aspects an audit procedure by the procurer or a third party certification is usually needed.

Another aspect mentioned on the literature of public procurement are the employment effects. Publication V highlights the local core employment, but it can be extended to vulnerable groups, like the long-time unemployed (Erridge 2007).

2.2.6. Summarizing processes and tools

To analyze processes, a purchasing process model by the author was used. The model was initially developed to create a requirement analysis for purchasing software; it was also developed to be used for educational and consulting purposes. For this thesis specifically, it was revised to focus on public procurement.

This model is divided into five process levels. The first describes 28 processes on the management level, mostly looking at monitoring and reporting to management. The second has 15 organizational-level strategy processes including sustainability, innovation, and local/SME policies, among others. The third level includes 15 category management processes. In this revised version, category management was separated from

the sourcing process. The fourth level includes 19 sourcing processes. The fifth describes 29 procure-to-pay processes.

In comparison to the study on procurement topics by Patrucco et al. (2017), the number of articles were translated to a process view even though they were classified as either strategy content, goals, processes, tools, or performance. On the procurement management level, the classification framework recognized reporting as one process, but there was no article written. On the procure-to-pay level, order management was mentioned in the framework but no articles were written for that position either. One reason might be that the majority of public procurers are not involved with procure-to-pay processes. Another reason might be that the public procurement research community does not see the area as appealing. Under the classification of e-Purchasing technologies, there were 37 articles expressing the use of ICT in either sourcing or procure-to-pay processes. The articles in the study of Patrucco et al (2017) are allocated to process levels in Table 13.

Table 13. Articles in the Study of Patrucco et al. (2017) Identified by Process Level

Process level	processes	articles
Procurement management	28	122
Strategy	15	125
Category management	15	72
Sourcing	19	61
Procure-to-pay	29	0

Tools (and procedures) were also mentioned by Patrucco et al. (2017), mainly addressing e-purchasing technologies.

Engaging with community benefits necessitates an alternative way of thinking. In that respect, involving CB is a kind of innovation and therefore GPP and the inclusion of SMEs and local businesses can be viewed as innovation frameworks. Some parts of procurement can be concentrated with sourcing (one Request For Proposal (RFP)–one order/contract). The other type involves framework agreements on goods, services and/or construction, when the process is divided into two levels: sourcing and procure-to-pay-processes (one RFP–several orders).

In scientific papers scholars try to present larger constructs (such as “early supplier involvement”), whereas in the practical procurement work the individuals should break that construct into process levels and further into individual processes. Using processes and tools from an individual perspective was presented by Igarashi et al. (2017) and Eikelboom et al. (2018). In this thesis the processes and tools can be classified into the following categories.

Ways-of-thinking frameworks

Ways-of-thinking processes and tools – in the innovation frameworks of the OECD (2005) and Keeley et al. (2013) - comprise the first category. When procurement professionals are developing specifications, these frameworks can open their eyes to different angles of the specification. These can be used either in the internal specification development with the user organization or with the suppliers. Both frameworks are made for enterprises making the innovations, not for procurement purposes. Keeley et al. (2013) suggested that one should employ one aspect at a time with a high quality of aspiration. The framework of Hommen and Rolfstam (2009) was made for public procurement, whether the public entity is buying for its own use or whether there are other public or even private users of the innovation. The authors also pointed out the maturity level of the innovation.

In GPP, the Global Reporting Initiative is a way-of-thinking framework. With SME-local procurements the individual could think of the distribution of procurement volume in terms of different sizes of enterprises (large, medium, small, and micro) in the first- and second-tier groups of suppliers. The great majority of enterprises fall into the category of micro-enterprises, while there are usually no national statistics to support the monitoring of their share in the national economy.

Sourcing processes and tools

Several sources (Edquist 2009, Valovirta et al 2017) emphasize the use of a performance-based requirement definition. The second type of learning is market consultation: recognizing opportunities and revealing possible unnecessary barriers for SMEs. Both of these allow for identifying variants or alternative ways of realizing the requirements, causing in some cases extra work for defining the Request for Proposal [RFP] (Wondimu et al., 2018). Additional sourcing tools are qualification criteria, especially specific to supplier personnel capacity, and awards criteria, giving extra points in the awards process. Legal tools include the public procurement procedures and contract types. The examples from the literature were mostly relating to the construction sector. More legal tools are likely to be revealed by a more thorough literature review of the works published in legal and technology journals.

Other processes and tools

Community benefits can be supported by processes in two ways: (1) identifying what processes have an impact; and (2) understanding how the processes are performed. The five levels of processes are procurement management, strategy, category management, sourcing and procure-to-pay.

In Publication IV, the earlier version of the process level was used as a maturity model. On the *procurement management* level was monitoring (what process), and at the maturity stage, there were different levels relating to how this monitoring could be done. Likewise, SME-local participation can be monitored, as presented in Publication V.

On the *strategy* level there was the green business plan (what process) and at the maturity stage there was discussion of how advanced the business plan was (how). Similarly, there might be a strategy for innovations and SME-local aspects.

The *category management* level was not included in the previous version of the process repository. On this level, GPP would refer to market consultations, which is a broad-level investigation of environmental impacts for the category. In SME-local procurement on the category management level, the procuring entity can plan the distribution of business for different levels of enterprise sizes.

The *procure-to-pay* level was missing in the literature review by Patrucco et al. (2017). Publication IV highlights selecting items or services with a lower environmental impact when using framework agreements. This could be supported by an ordering software with selection features.

In this thesis, processes and tools are given for the individual PP professional working with procurement in a public entity. The other consideration is what the public procurement organizations should be doing by themselves or in collaboration with others. According to Rainville (2016), the procurement units in innovation procurement can be divided into three clusters: (1) direct procurers, (2) collaborative innovation procurers, and (3) pre-commercial, supplier-focused procurers. The collaborative units have expertise for performing innovative procurements and provide the results for the direct procurers. The process could be performed as follows: Taking the British framework for innovation, first identify the problems, unmet needs, and opportunities. Then, draft some large procurement, volume outcomes-based requirements. These could be the object of single-definition challenges for innovation for early or middle-maturity types of innovations. The other category could have a broad definition requirement like, “solutions providing more efficient life cycles for buildings” or “customer-specific rehabilitation aids for small volume target groups” for the late maturity of innovation in the diffusion stage. The second group can incorporate even a small procurement value (under threshold values) innovation which can have a large impact on the public service provision. The second group could be procured by framework agreements or by a dynamic procurement system. As indicated in Publication II there are a great number of small value innovations; these could present a way of opening an innovation procurement procedure to be diffused effectively, with the supplier market promotion in several countries.

The second consideration is that innovation procurement takes more time. Therefore, professionals in collaborative procurement units should evaluate a type of business model, other than which involves percentage commissions for framework agreements. Either the framework users pay a fixed fee for these innovation framework agreements or members at the board level accept a certain budget for innovation procurement. The evaluation is based on the benefits collected by the procured innovations.

3. Research Methodology

The research strategy of this study builds on the research approach, research design, and methodological choices. The research approach describes the researcher's view on the reality and what kinds of scientific constructs are searched. Research design highlights the practical process steps of conducting the research. Methodological choices reveal the search and decision of research methods.

3.1. Research approach

One of the frameworks of epistemology and ontology is that of Burrell and Morgan (1979) who offered four paradigms. They suggested that each paradigm contains assumptions that are either:

- (1) *objectivist*, in which there is an external viewpoint from which it is possible to view the organization, which is comprised of consistently real processes and structures; or
- (2) *subjectivist*, in which an organization is a socially constructed product or a label used by individuals to make sense of their experience.

Each paradigm makes assumptions about the function and purpose of research in investigating the world of business as either:

- (3) *regulatory*, in which the purpose of business research is to describe what goes on in organizations, possibly to suggest minor changes to improve them, but not to make any judgment; or
- (4) *radical*, in which the point of management and business research is to make judgments about the way that organizations ought to be and how this could be achieved.

Based these paradigms, this research is objectivist, using accounting data based records to analyze public procurement. On the other axis, the research looks the organization in the regulatory viewpoint. Public procurement's main objective is to procure goods, services, and construction fit for purpose with favorable economic terms. Usually, the community benefits are minor changes as a secondary objective, but there is a rising pattern of looking at climate change as a radical requirement, especially concerning CO₂-emissions.

Burrell and Morgan's (1979) framework was further developed by Morgan and Smircich (1980) in Table 14.

Table 14. Ontological and Epistemological Approaches (Adapted from Morgan and Smircich 1980)

	Subjectivist Approaches to Social Science				Objectivist Approaches to Social Science	
Core Ontological Assumptions	Reality as a projection of human imagination	Reality as a social construction	Reality as a realm of symbolic discourse	Reality as a contextual field of information	Reality as a concrete process	Reality as a concrete structure
Basic Epistemological Stance	To obtain phenomenological insight, revelation	To understand how social reality is created	To understand patterns of symbolic discourse	To map contexts	To study systems, process, change	To construct positivist science

Based on the work of Morgan and Smircich (1980), this research represents two approaches. The first one, in publications I and V, looks at reality as a concrete structure, and on an epistemological point tries to construct positivist science. Publication I makes a definition of public procurement in accounting terms, while publication V uses the same definition and combines the definition with supplier size and location. The other publications are positioned one step to the right as innovations are more like concrete processes and the epistemological stance is to study systems or processes.

Another type of methodology for case studies was introduced by Järvensivu and Törnroos (2010) in Table 15. It was proven to be successful in business-to-business networks. They introduced moderate constructionism as a new type and compared it with naïve realism, critical realism, and naïve relativism.

Table 15. Comparison of Different Views (Adapted from Järvensivu and Törnroos 2010)

	Naïve realism	Critical realism	Moderate constructionism	Naïve relativism
Ontology	Only one, true reality exists; universal truth claims apply	There is a reality; specific local, contingent truth claims apply	There maybe a reality; specific local, contingent truth claims apply	There is no reality beyond subjects
Epistemology	It is possible to know exactly what this reality is through objective, empirical observations	It is possible to move closer to local truths through empirical observations, bounded by community-based critiques/points of consensus	It is possible to understand local truths through community-based knowledge creation and empirical observations	It is possible to form an understanding of the subjective reality through analysis of the subject's account of knowledge
Methodology	Direct empirical observation	Empirical observations bounded by subjectivity and community-based critiques/points of consensus	Community-based knowledge creation through empirical observations bounded by subjectivity	Analysis of knowledge structures and processes by observing texts
Research process	Deductive; theory testing	Abductive; theory generating and testing	Abductive; theory generating and testing	Inductive; theory generating

They claim that abduction is a suitable research process for moderate constructionism: “Unlike induction, abduction accepts existing theory, which might improve the theoretical strength of case analysis” (Järvensivu and Törnroos 2010, p. 102).

From the ontological point of view there may be one reality or several subjective realities. Concerning the value of public procurement there can alternative perceptions. Some procurement people may see public procurement as the tasks performed by his own department.

From the methodological reasoning point of view this research is mainly inductive, but publications I and III reflect abductive reasoning, while there is a theory to be tested. Publications II, IV, V involve processes and tools that are inductive, although there is always some kind of theory involved, such as the theory of innovations, and a definition of green public procurement also serving as a theory. There are, therefore, abductive elements in every part of the research.

3.2. Research design

The research problem involves exploration of how to promote community benefits in public procurement. The major drivers for that question were two Lappeenranta University of Technology (LUT) research projects. The research design is presented in Figure 6.

The research started with an LUT project carried out from 2012 to 2014 called *Value-Driven Innovative Public Procurement in Social and Healthcare* (Sintonen et al. 2014). Publication II was also included. That started the exploratory research on innovations. Innovations were searched from three countries and a database of 167 innovations was collected in order to capture meaningful categories. The innovation database is focused on social work and healthcare. The database complements the cases described by Valovirta et al. (2017), which were concentrated on other sectors of public procurement.

The second LUT project started soon after the first one. In the research project *Sustainable and Innovative Purchasing*, both enterprises and public entities participated. Based on the researcher’s experience, usually the consulting projects on an organizational level started with assessing the total spend using often comprehensive invoice data. In that project the total spend was calculated on the national level. The total concept ensured that no part of the procurement volume was neglected.

In 2014 the Nordic Council of Ministers funded a consulting project on Green Public Procurement focused on National Framework agreements. The researcher participated in that project as a consultant. Publication IV was further elaborated on in the final report of that project. The need for different levels of processes was already highlighted. The tools were concentrated on sourcing processes and neglected, by and large, the other procurement processes. GPP criteria showed the need for tools.

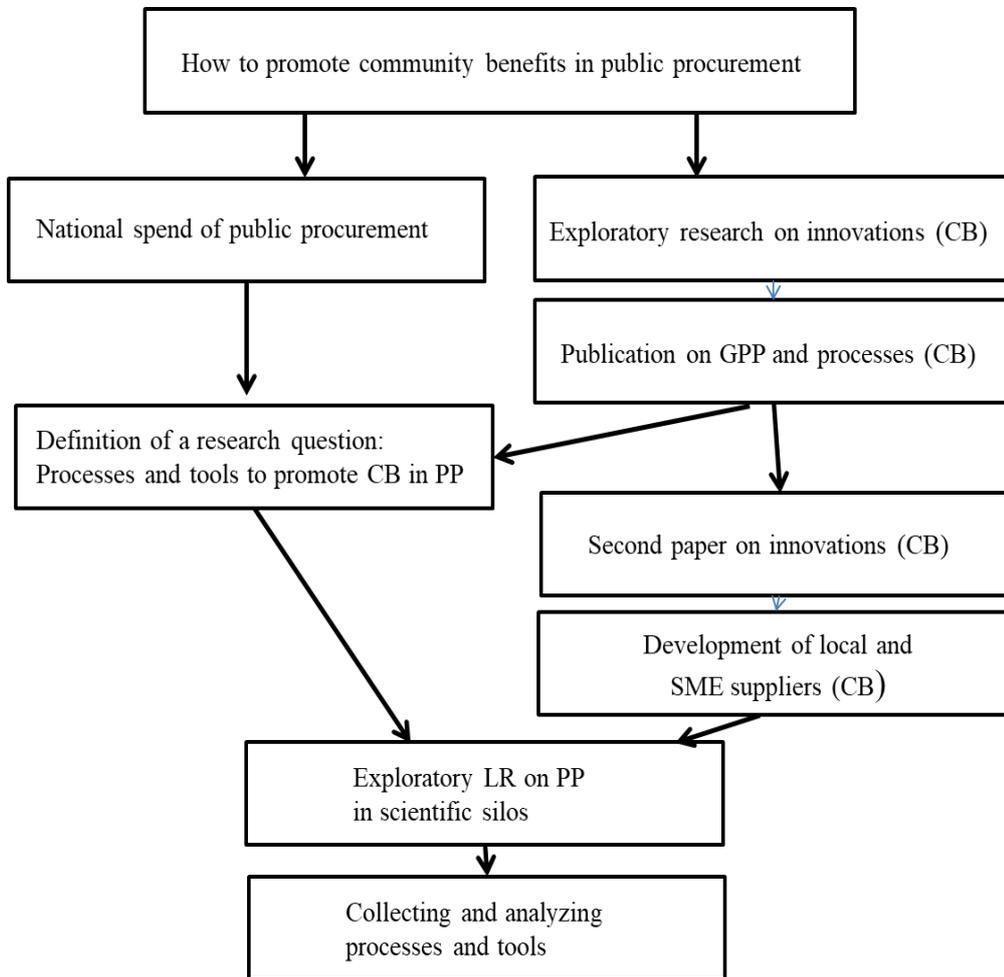


Figure 6. Research design

During this time the researcher participated in an IRSPP workshop in The Hague, exploring public procurement issues under the heading *Community Benefits*. Given the great amount of literature in that area, the research question culminated into that involving *processes and tools to promote community benefits in public procurement*.

The next step of the research involved another publication on innovation, by way of exploring a framework by Keeley et al. (2013). This provided a good view on ways-of-thinking approach. By employing another aspect in the same product/service it rises the level of innovativeness.

The basis for the study on SMEs' and local suppliers' shares of municipal procurement came from the municipality procurement managers. After completing consulting projects in seven municipalities, there was a possibility of drawing scientific conclusions in the form of a conference publication. Also, every case had its own characteristics and offered a learning curve.

As a public procurement consultant in healthcare, the writer of this thesis came across the term *purchaser-provider model*. That raised the question of different scientific silos in public procurement. During the first research project there were social care researchers from the University of Eastern Finland. With them, the theory of social services was explored. From these experiences emerged the need to explore “the other words and constructs” of public procurement. That was via a literature review addressing scientific silos.

In the final stage processes and tools for procurement experts were collected from previous literature and publications. The methodological choices were decided on for each part; these gradually improved after attending the methodological courses.

By the suggestion of the reviewers, social aspects of the community benefits were added to the thesis, as this aspect was latently mentioned in many publications.

3.3. Methodological choices

The methodological choice was a central question during the research. There was a large amount of quantitative data, typical for procurement consulting business, but no direct methodology to fit the analysis. The answers were sought from Bryman and Bell (2015) regarding business research methods; Smith (2015) regarding research methods in accounting; and Karlsson (ed) (2016) regarding operations management. One could anticipate that operations management would have a research method for purchasing as inventory management researchers can use inventory records for hundreds of thousands of warehouse items in a period of several years. Finally, the methodological choice was constructed from studying the work of Yin (2017), using descriptive quantitative data with a qualitative analysis.

3.3.1. Qualitative research

The research question is a “how” question: How do we promote community benefits in public procurement? Later, the “how” is more narrowly defined as processes and tools. The natural choice for answering this of question is to pursue a qualitative approach.

Voss et al (2016) highlight the use of archives, in this thesis invoice data, statistics and secondary data on innovations. “A case study is a history of a past or current phenomenon, drawn from multiple sources of evidence. It can include data from direct observation and systematic interviewing as well as from public or private archives. In fact, any fact relevant to the stream of events describing the phenomenon is a potential datum in a case

study, since context is important.” (Voss et al., 2016, p. 167, originally by Leonard-Barton 1990). Yin (2017) described different methods for answering various research questions (Table 16):

Table 16. Research methods by Yin (2017)

Method	Request Questions
Experiment	How, why
Survey	Who, what, where, how many, how much
Archival analysis	Who, what, where, how many, how much
History	How, why
Case study	How, why

This research has three different kinds of cases. The first type could also be named an *archival analysis* since the cases had large amounts of accounting-based data, starting with invoices and annual reports and moving further into financial statistics derived from annual reports. From this data it was possible to also answer questions like, “How many?” and “How much?” When analyzing local procurements, the invoices were connected to each supplier’s location in a municipality, thus also answering also the question of “Where?” This could be called descriptive statistics in a case study.

With the second case type, secondary data from innovation bodies was used to describe 167 individual innovations from three countries. This also involved one type of evidence. The third type was derived from a consultancy report as a single case and a maturity model was developed out of that.

In contrast with Voss et al. (2016) who pointed to multiple sources of evidence, with the first type only one type of data was used, but it included complete data, not just a small number of case organizations. This data is called secondary data, as the data was collected for another reason. Accounting data was collected to make the annual report of the organization. Bryman and Bell (2015) concluded that secondary data offers the opportunity to employ high-quality datasets that are based on large, reasonably representative samples. As invoice data from a municipality, this refers to all transactions rather than a sample. Yin (2017, p. 60) pointed out that “...case studies can include, and even be limited to, quantitative evidence...” and “...some survey questions (such as those seeking categorical rather than numerical responses) rely on qualitative and not quantitative evidence.” Later on, Yin (2017) recognized variations of case studies as single case, multiple, and multiple with a cross-case.

The use of official statistics by Hindess (1973) shed light on ontological questions relating to official statistics. The author described several problems concerning the classification of data (e.g., suicide vs. natural death) and the classification of rural workers. Bryman and Bell (2015 p. 334) pointed out the categorization problem related to unemployment during labor disputes.

Given the different research methodologies, the five publications can be classified as follows:

- Publication I is a single case study on the spend analysis of PP on a national level.
- Publications II and III are based on the archival analysis of innovations.
- Publication IV is a single case study on processes and tools promoting GPP.
- Publication V is a multiple case study based on archival analysis of local and SME suppliers.
- The introduction is a cross-case study concerning the processes and tools.

3.3.2. Archival sources/secondary data

The archival sources in this thesis are official statistics, annual reports, invoice data, and innovation case descriptions.

All financial information (official statistics, annual reports, and invoice data) are possible objects of classification errors, mainly concerning what is considered to be public procurement. There might be misclassifications of subsidies in the cases in which service vouchers were used. Otherwise, the figures should be ontologically true data, because there are accounting guidelines and the accounts were checked by external auditors. The same data set was also sent to the statistical office of Finland. The other possible classification error has to do with which organizations are public entities or which should follow the Public Procurement Act.

Innovation case descriptions present a number of innovations, either procured or made in-house in the organization. Also, the classification here might have biased, but as the nature is exploratory and the samples are out of convenience, it does not have a vital effect.

3.3.3. Case selection

The cases involved different community benefits. Publications II and III included study innovations, specifically in the social work and healthcare industries because the university had a research project in that area. Publication IV was focused on green public procurement developed upon a consultancy report made in five Nordic countries. For publication V, two phenomena were investigated. The first was a common PP policy on SME inclusion and the second was on procurements from local suppliers.

The cases (from seven municipalities) used in publication V were pulled as a convenience sample, as the data had already been obtained. They included both focal municipalities and the second largest municipalities in the area.

3.3.4. Data gathering

Like Bryman and Bell (2015) concluded, secondary data offers the opportunity to employ high-quality datasets that are based on large, reasonably representative samples.

Publication I used only one case, but required the gathering of available statistics, procurement advertisements, and annual reports from different sources. Publications II and III used the same case collection including 167 innovations from Finland, Sweden, and the UK. The data gathering was made by searching the information on innovation bodies in these countries and accessing the project databases through them. Publication IV was further developed from a consultancy report, involving more than 60 interviews in five Nordic countries. Finally, publication V initially required a data export from the ledger or invoice handling software, including thousands of invoices and additional data on the suppliers.

3.3.5. Data analysis

The early publications of innovations used qualitative analysis, not describing the Gioia type data structure. However, the elements were described in text.

The analysis of the data itself and the calculation results were done using the Gioia method (Gioia et al., 2013). This method is normally used with qualitative archives, but it was used here for numeric calculation results based on invoice data (archival data). The Gioia method is especially well-suited to exploratory research.

3.4. Validity and reliability of the study

Validity and reliability are the classical quality concepts for quantitative research. Beverland and Lindgreen (2010), originally introduced by Yin (1994) defined four different criteria for qualitative research: (1) construct validity i.e. to ensure that correct operational measures have been established for the concepts that are being studied; (2) internal validity i.e. to make sure that a causal relationship — certain conditions lead to other conditions.—has been established. Internal validity is a concern of explanatory or causal case studies but not for exploratory or descriptive cases that do not attempt to make causal statements; (3) external validity i.e. to prove that the domain to which a case study's findings belong can be generalized; and (4) reliability i.e. demonstrating that the findings from a case study can be replicated if the case study procedures are followed.

For qualitative research there are alternative criteria. Kihn and Ihantola (2015) made a classification of qualitative studies in management accounting. One of the common approaches is trustworthiness, which was presented by Lincoln and Guba (1985). It is divided into four dimensions: dependability, conformability, credibility and transferability. Dependability refers to a carefully documented process. Conformability refers to the dimension that data and research findings are easily understood by others. Credibility means that the researcher has sufficient data to make claims, as well as strong logical links between observations and categories. Transferability has to do with whether some kind of similarity can be found in other research contexts.

Golafshani (2003) compared validity and reliability in quantitative and qualitative research., quoting Patton (2001) and Hoepfl (1997). Qualitative research involves a

naturalistic approach in the attempt to understand phenomena in context-specific settings, such as “a real world setting [where] the researcher does not attempt to manipulate the phenomenon of interest” (Patton, 2001, p. 39). Unlike quantitative researchers who seek causal determination, prediction, and generalization of findings, qualitative researchers instead seek illumination, understanding, and extrapolation to similar situations (Hoepfl, 1997). Golafshani also referred to Stenbacka (2001) on reliability. The quality concept in qualitative studies has the purpose of “generating understanding” (Stenbacka, 2001, p. 551). A further aspect is triangulation, in which Golafshani referred to Mathison (1988) Triangulation has arisen as an important methodological issue in naturalistic and qualitative approaches to evaluation in order to control bias and establish valid propositions, this is because traditional scientific techniques are incompatible with this alternate epistemology. (p. 13).

This research has two kinds of methodological choices, both with a naturalistic nature. In Publications II and III, the unit of analysis is innovations, and a large exploratory database was created and analyzed. The database consisted of 167 innovations from Finland, Sweden and the UK. The cases had low causal densities and could be referred simply as “cases” rather than “in-depth cases” (Yin 2013). The external validity is good, because the study already covered three countries and could be further replicated in developed countries. The number of cases also supported reliability from the perspectives of social and healthcare concerns.

Publications I and V were focused on developing valid tools to measure the size of PP and to calculate employment and tax effects at the municipality level. The unit of analysis was monetary volume. In both studies the same definition of public procurement was applied. Both studies contributed to the generating understanding on PP spend and its nature. Internal validity was not considered, because in the study an attempt was made to create rather than test a calculation method. External validity was assessed and determined to be sufficient because the calculation method used System of National Accounts (SNA) definitions, which were complemented by other, secondary data. Therefore, the method of national spend can be replicated in any country using existing data sources. At the municipal level, the same calculation method can be used for other municipalities or regions. Further, reliability is enhanced because the calculation process allows for replication.

The unit of analysis in the introduction involves processes and tools for promoting community benefits. In the publications the naturalistic study revealed some processes and tools. Triangulation is made between the monetary values in Publication I and the innovation database used in Publications II and III. The monetary volume of the under-threshold value is quite small, but a great number of innovations fall into this category. The judgment of the monetary value of a single innovation was made by the researcher. On the other hand, the innovations have not necessarily been procured, but they could. The majority of the tools were collected with the use of an abductive reasoning taking

into account the different datasets. Innovations and other community benefits are a matter of the future and not in common use in public procurement entities.

4. Review of the Results

4.1 Public procurement spend analysis at a national level in Finland (Publication I)

The first objective developed for this thesis was to give an overall picture of public procurement. The authors of the publication mentioned above made a definition of public procurement in accounting terms by following guidelines. First, procurement was explained as a supply of materials, services, or works including financial services from an independent organization. Second, the authors outlined the difference between procurement and internal invoicing; this also defines an independent corporation. It means that unincorporated entities are not independent and thus their invoicing is internal invoicing. Third, the researchers made a distinction between procurement and transfer money. In the central government this is clear, but in the local government there could be a classification error: Service vouchers and personal budgets may fall under subsidies, which should be regarded as procurements.

The estimations of the monetary volume of public procurements were made using System of National Accounts figures, which are concentrated on the general government, leaving out publicly-owned non-financial and financial corporations. As the SNA is focused on generating GNP calculations, eliminations are made concerning the procurement of healthcare services by municipalities from joint municipalities in the Finnish environment.

The authors made a calculation (Figure 8) based on statistics and annual reports and found out that the national level of public procurement was €52 billion, compared to €38 billion indicated by the figures of the procurement indicators (European Commission, 2016a), taking into account the general government sector (Figure 7). This extended volume is then further broken down into type of procurement (Figure 9), type of entities (Figure 10) and legal type (Figure 11).

S13	S11	S12	S14	S15
General Government Sector	Nonfinancial Corporations Sector	Financial Corporations Sector	Households Sector	Nonprofit Institutions Serving House-holds Sector
Central government	Public corporations	Public corporations		
State government				
Local governments	Private corporations	Private corporations	Private	Private
Public sector				

Figure 7 Public sector's relationship to other institutional sectors of the economy (International Monetary Fund, 2014).

The calculation process was conducted in a bottom-up method, as there was not reliable statistics available in sectors S11 and S12.

Central general government	Annual report	Choose accounts
		Remove internal invoicing
Sub-central general government	Statistics	Choose accounts
		Remove internal invoicing
Corporations owned by central government	Statistics	Choose accounts
	Annual reports	
Corporations owned by sub-central government	Statistics	Choose accounts
	Sample of annual reports	Add possible horizontal invoicing
Other organizations obliged to follow public procurement rules	Branch-wise statistics	Choose accounts
	Sample of annual reports	Choose accounts
Occasional public procurement	Procurement notices	

Figure 8 Process of calculating the size of public procurement.

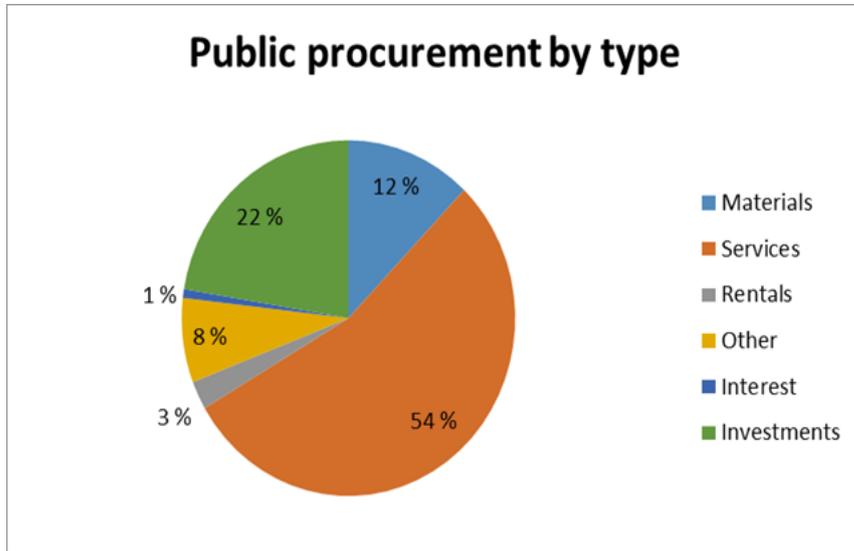


Figure 9. Public procurement by type

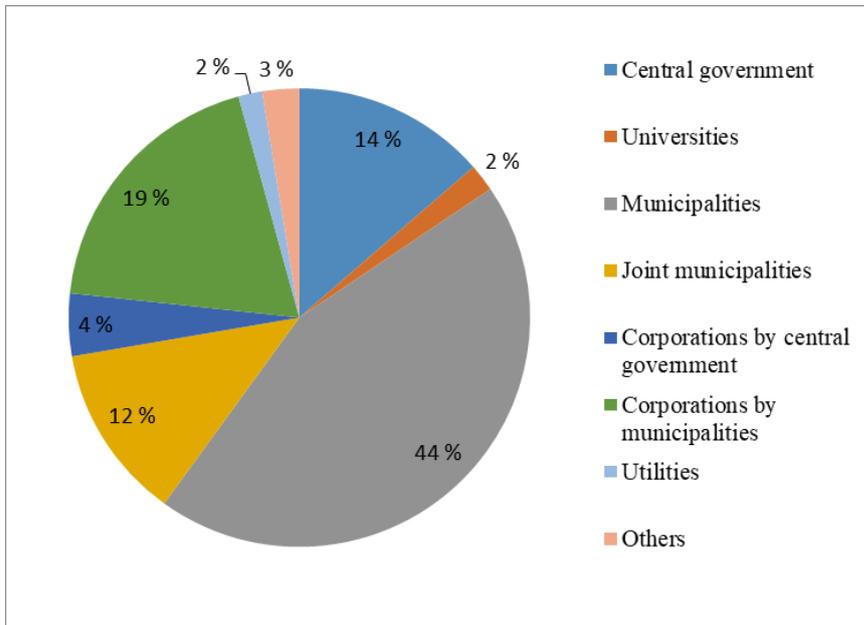


Figure 10 Procurement by entity type

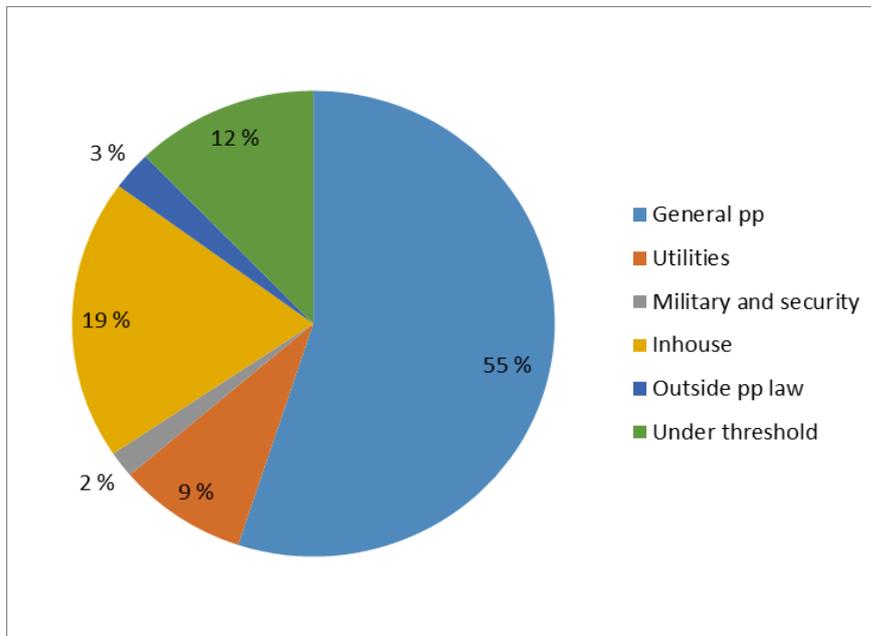


Figure 11 Public procurement by legal framework

The main conclusion of the publication is that the spend analysis shows significantly higher figures of public procurement than the PP indicators used by the Commission (European Commission, 2016a). Out of managerial point of view, the procurement volume is not the same volume as the procurement department is responsible for. Second, a large proportion of public procurement is made from in-house organizations, which could be the direction of further research.

The implication of the processes and tools for Community Benefits address the actions of the total volume of public procurement. The legal framework offers different kinds of toolsets for each type of legal category.

4.2 Innovative procurement processes and their use in the social and healthcare sector (Publication II)

The first approach to the Community Benefits was innovation, especially in the social and healthcare sectors.

This empirical research was based on 167 exploratory innovations in the social and healthcare sectors of Finland, Sweden, and the UK. The data source was the secondary data of development projects or observations of good practices accessed from innovation bodies from the three countries. The objective was to find out which kinds of innovations

there are in order to develop processes to procure innovations. The cases by type are presented in Table 17.

Cases by TYPE	All
Development of individual services	3
Development of several services	2
Development of services, technology, and premises	2
Coordinating services	21
Services	43
Supporting services	3
Enabling technology	61
Materials	19
Premises	2
Other	11
Together	167

Table 17. Innovation cases by category type

The other angle represented the inductive approach to define a process for procuring innovative products. The most innovative part occurs before the sourcing process.

The process is divided into 15 process phases, which include:

- Defining the scope of the purchasing object

In defining the scope we can use make-or-buy analysis for the ongoing services. The question is typically whether outsourcing is more economical or whether it offers more quality for the same price. The outcome of the analysis can also be insourcing the services.

A sub-question has to do with whether make-or-buy analysis may be used for the development of operation and change management. Do we buy them as a part of ongoing services or do we do so separately?

The second aspect of the scope is a strategic decision of ownership of the premises. Within purchasing definition this falls under the definition of make-or-buy decision, but in administrative sciences this referred to ownership strategy.

The third aspect is evaluation of congeneric or extrinsic needs. (Hommen and Rolfstam, 2009). Can the purchasing object have other users than the buyer organization? In case of the social services there can be qualified suppliers for wholly customer paid services.

The fourth aspect is life-cycle cost. This is considered in public-private partnerships or variations of it. The second application is life-cycle cost of people to be cared for – in

case of an early cure there is the possibility of avoiding longer or more expensive care periods.

The fifth aspect is that of technology as an opportunity (technology push) or public technology procurement (need pull). In this aspect the public entity is procuring a product or service which is to be developed within a reasonable time. This can require one supplier or a network of suppliers.

(2) Defining the customer types

In case of a congeneric and extrinsic scope the customer types have to be defined.

(3) Defining the customers within the customer types

Within the customer types are different groups, each having as their own values. In the social and healthcare fields there are end customers, their relatives, the management of the public entity, personnel of the public entity and the politicians. These customer groups can also be referred to stakeholders.

(4) Defining customer values

The first subset of value is that of general customer service values: in this paper social and healthcare values are examined. Andreasson and Winge, (2010) described eight of them: understanding what is happening, being accessible, co-determining, having knowledgeable personnel, avoiding pain, comforting, having a good approach and engaging continuity.

The second subset has to do with measurable service or product specific values, especially in the social and healthcare fields. Examples of these are Resident Assessment Instrument (RAI) for elderly people.

The third subset is widely accepted values such as environmental values or social values. These have roots in politics e.g. environmental politics and social politics.

The fourth subset is savings, especially in procurement terminology. In purchasing economic considerations are measured by cost reductions, which can be caused by lower unit prices or reductions in demand. Indirect economic value is measured by the salary or wages of the employee and daily payments from the Finnish social security agency.

The fifth subset is economic values other than savings. Innovative procurement can be catalytic in sourcing for products and services, which can be bought by extrinsic customers. It can also exist beyond the scope of the purchasing object.

The sixth subset is political values, which is beyond that of widely accepted values. These can include party politics, local politics, or individual politics.

(5) Conducting reverse marketing for innovations

Reverse marketing for innovation is a term referring to an active statement for searching innovations and promoting them to suppliers. It can involve specific, user driven innovations, value-based innovations, or technology-push innovations. In order to function properly, the suppliers' suggestion has to be handled in a reasonable time.

(6) Conducting supply market research / search for innovations

According to von Hippel (1988) innovations can be offered by customers, competitors or suppliers. Monckza et al (2010) additionally recognized government research organizations, universities and other sources. Let us look at competitors and suppliers.

Public units typically have no competitors, so the relevant term can be similar domestic or foreign organizations. Suppliers can be further classified from the innovation point of view as follows:

- direct material suppliers
- direct service suppliers
- indirect equipment suppliers
- indirect service suppliers (development and planning)
- machinery investment suppliers
- construction investment planners
- construction investment suppliers (complex product systems)
- second-tier suppliers
- suppliers within a network

(7) Setting up the competition

After we know values and suppliers, we must decide from which supplier group the innovations may be sought.

Secondly, we must decide the scope of the RFP, whether we are sourcing the lifecycle of the customer, or just coordinating services, as well as whether there are catalytic possibilities.

Thirdly is the change or development process within or out of scope.

Defining whole or partial orders will serve the goals of multiple SME-suppliers versus the economics of scale from large companies.

Fifthly we must separate large volume bulk products from innovative framework agreements with small monetary value.

(8) Determining purchasing requirements

According to O'Brian (2012), this means:

- regulatory requirements
- assurance of supply
- quality
 - specification based on the previous 4 phases (among other things)
- service
 - general service requirements
- cost / commercial considerations
 - savings goals
 - other economic values
 - commercial terms and conditions
 - incentives for innovation benefits
- innovation
 - capabilities for innovating
 - arrangements for sharing and collaborating

(9) Determining the quantity for RFP

For an RFP, the quantity of requested products and services must be collected.

(10) Determining supplier requirements

Supplier requirements (qualification criteria) from public procurement law are compulsory. In addition to those there can be RFP-specific qualification metrics, e.g. credibility of the company and a list of references.

(11) Determining award criteria

The award criteria can incorporate quality aspects, innovation and other things. With the current market court practice the evaluation metrics must be defined in advance, so this inhibits the innovation potential.

(12) Establishing the selection procedure

For innovative procurement we can use standard procedures, if only the object is innovative. If special procedures are needed, we can use precommercial procurement, negotiation procedure and competitive dialogue.

(13) Providing notice

Legal notice shall be sent to OJEU for the procurement of over threshold-value products, services and construction.

(14) Issuing the request for proposal

In terms of innovative procurement we can use the standard procedure. The innovative part comes in questions and answers and when using negotiation or competitive dialogue.

(15) Evaluating the proposals

Proposal evaluation is processed in three phases. First, the supplier must be qualified, and second, the proposal must correspond the RFP requirements. Third phase the proposals must be evaluated with the understanding of the award criteria. This phase is for innovative procurement of the difficult one, because the award criteria have to be decided in advance.

The publication highlights three points. First, there are many off-the-shelf innovations on the market, but nobody is searching them. Second, public organizations seldom have an innovation organization. Third, customers' values and experiences are not known to public organizations.

The article identifies the frameworks for recognizing different categories of customer values, sources of innovation, and the maturity of innovations. It also offers an initial suggestion for a process to procure innovations.

4.3 Processes for innovative public procurement (Publication III)

This publication offers an analysis of the same database of innovations as in Publication II by using 10 service innovations from Keeley et al. (2013). The cases concerning equipment and materials and those without a case description were excluded, leaving 107 to be analyzed. Each case could be placed into one of several categories of innovation. The results of the analysis are presented in Figure 12. Based on the analysis, it traditional innovation aspects (product/service performance, core process) were found to predominate. With other aspects the innovation level could be enhanced.

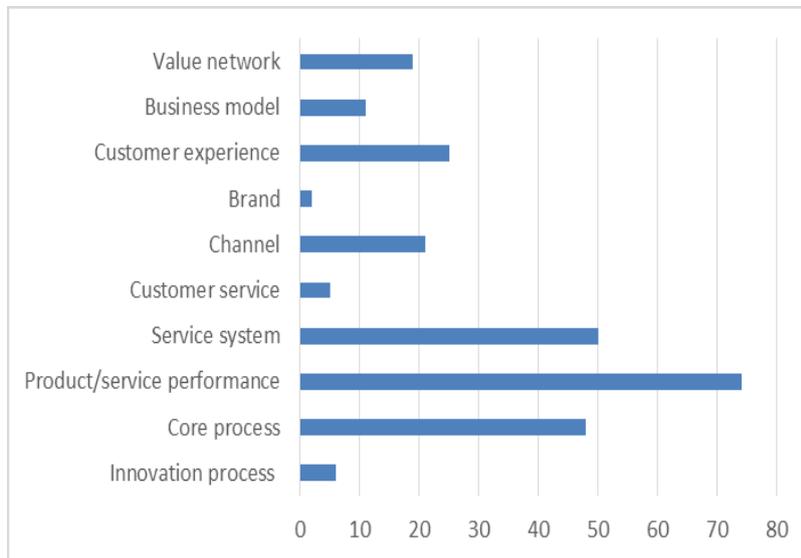


Figure 12. Number of cases according to the innovation framework of Keeley et al. (2013)

After analyzing the cases and categorizing them in the framework of service innovation (Keeley et al., 2013) we could suggest that a radical innovation could have following qualities. With radical innovations in the social and healthcare fields public entities have large reward potential.

- (1) The innovation is usually focused on one disease, and the same organization handles it from beginning to end with better product/service performance.
- (2) The service could use multiple channels to connect with the customer
- (3) The service could be connected to portal services offering additional information on the diseases,
- (4) The service portal could offer a community of people with the same problem
- (5) The service could support user empowerment
- (6) The service delivery could be provided by electronic means as much as possible
- (7) The portal could combine these tools for a service system or value network
- (8) The service organization could have ongoing discussions about what the customers want
- (9) The service production process could be transferrable to multiple locations

Finally, the Internet of Things model offers significant potential for electronic means of innovation in healthcare.

The innovation sourcing projects related to the technological maturity of the procurement objects can be categorized into six different types:

- (1) Off-the-shelf innovations (materials, enabling technology).
As Rolfstam et al. (2011) and Kivistö et al. (2014) demonstrated, there should be a way to create access to these innovations, which may be new in other surroundings. In a four-year framework agreement or dynamic purchasing system there is time for early acceptors as well as those accepting later.
- (2) Service innovations to be used in several entities.
These represent lower ambition levels than pre-commercial procurement (PCP), but are likewise diffused to user organizations.
- (3) Pre-commercial procurement (PCP) projects
Examples include such as diabetes care or procurement for disabled housing services.
- (4) Radical PCP-projects
These are more challenging, but the rewards are likely to be higher.
- (5) National service network projects
These include those, in which the joint procurement unit organizes and sources a service nationally. There are multiple functions within public entities in which centralized or centrally coordinated services would be better and/or more cost-efficient.
- (6) Innovation competitions
These are based on broad ideas of what the customers are seeking. This can be divided either into a one-stage model or a two-stage model and it also allows public organizations to use open sourcing or crowdsourcing. In the two-stage model there is the possibility that the innovation organization is a small enterprise or an individual who cannot perform the actual production or supply duties.

In this discussion about public procurement for innovation the role of innovations in economic development is emphasized. There is a need to categorize those economic impacts, whether in terms of productivity in public organizations or growth of (national) supplier organizations, or both. When there are no national growth companies, the leaders of procurement process might look for the best suppliers internationally.

A second theme for future work was raised by Kalvet and Lember (2010), who introduce different kinds of contractual terms. These correspond to the Keeley categorization business models. There are risk concerns as well as those having to do with revenue, intellectual property rights, and incentive aspects. A third topic for future studies is organizational characteristics, which can enable or stop the diffusion of the innovations.

4.4 Monitoring Green Public Procurement (Publication IV)

The Nordic Council of Ministers (NCM) assigned a research group to investigate green state framework agreements. The aims of the project were to describe GPP practice in

terms of state framework agreements in Nordic countries; propose country-specific ways to improve the situation, and draw a general model of efficient ways to improve the situation.

The interviewees were to be from state governing bodies, the state procurement unit, user organizations of framework agreements, advisory bodies, suppliers, and national enterprise organizations. The governing bodies included the supervising body for the procurement unit, as well as legal and environmental bodies. A total of 65 interviewees were included. In addition to interviews, samples of good and bad tender documents were collected.

After individual country reports were compiled, it was recognized that the Finnish way of having a green marking for framework agreements is considered one of the best practices. On the other hand, this marking is derived from legal methods of implementing green values instead of environmental impacts. The method corresponds with the methodology created by Bouwer et al. (2005). Norway has a third-party system in which eco-labelled products can be registered.

Based on the interviews, it was evident that there are environmental aspects the suppliers can provide but that are not used by procurement units. One of the examples is the reporting of CO₂ emissions. The other comment from suppliers was that the procurement unit did not verify the information given in the tender documents.

Some suppliers claimed that the procurement units had very little green criteria. In one of the bad tender documents two successive competitions of short-term car leases were analyzed. In the former competition, the supplier could obtain award credits of 4% from the share of vehicles that satisfied the criteria of having CO₂ emissions of less than 140 g/km. In the latter competition, the vehicles were classified into size groups, which had the maximum requirements for CO₂ emissions. In this case, the supplier had the perception that the procurement unit had no green criteria. The same phenomenon was found by Michelsen and de Boer (2009).

The country reports for Denmark, Finland, Iceland, and Norway showed a variety of objectives, a need to strike a balance between cost and green functionality, and the availability from local suppliers and green functionality. In one of the good cases, two successive furniture tender documents were analyzed. In the earlier competition, the tender was divided into normal and eco-furniture due to lack of competition. Phasing the situation, the procurement unit stated that in the subsequent competition there would only be green requirements. The latter competition had four acceptable suppliers, all of which obtained framework agreements. This case revealed not only a supplier development aspect in procurement processes but also a way of commercially procuring maximum green requirements. The tender documents named more than 20 substances which should not be in the products. The requirements are derived from EU GPP criteria. This example showed that the classification devised by Bouwer et al. (2005) is not sufficient. Some of

the procurement units had CSR reporting, and green public procurement was reported as an issue within the CSR-report.

In the interviews with procurement units, it was also stated that for some procurement categories it was difficult to determine criteria because they had only marginal green aspects. These categories were mainly non-material intensive services. The same was concluded by Bouwer et al. (2006). On the other hand, the government policy necessitated that green aspects are were to be taken into account in all procurements. From interviews with suppliers, it was also noted that there was room for development in terms of how requirements were defined.

In Table 19, we present a preliminary green public procurement maturity model. This is an overall model for a procurement organization. According to Bouwer et al. (2005), one of the main building blocks is the green procurement process. This includes the commissioning, tactical procuring, and ordering functions. In the commissioning, there is the possibility of considering greener functionality or, in other words, adopting a cross-category approach. The process of tactical procuring is divided according to the specification of van Weele (2005), and green requirements are a part of the specifications. Selecting a supplier in the GPP process implies that there are supplier evaluation criteria as compulsory requirements or as awards criteria. A supplier audit can also be part of the process. Contracting includes the actual contract and green contract terms. In the ordering function, the procurers should be able to make green product choices among all products.

Many of the green effects come from specifications, which is the other building block given by Bouwer et al. (2005). Both EU GPP criteria and environmental labels are based on scientific research and life cycle assessment (Fet et al., 2011). These processes involve considerable costs and therefore the procurement units are advised to follow these criteria. We selected these instead of the classification by Bouwer et al., because EU GPP criteria are based on suggestions by the same source. In some cases, they also provide specifications for suppliers' processes, thereby causing marginal impact on supplier selection.

The two remaining building blocks given by Bouwer et al. (2005) are greener functionality and use of green technology. Greener functionality is expressed as a focus on the impact and cross category approach. One of the examples of this is replacing travelling with videoconferencing. The use of green technology is a necessity for improving green impacts but also a part of innovation policy supported by the European Commission. Table 1 illustrates the framework of the maturity model for green public procurement.

The paper includes recommendations on how and in which processes environmental matters should be considered. The authors suggest using a maturity model for Green Public procurement (Table 18).

	Passive	Basic	Medium	Advanced	Strategic
Green business plan /Commissioning	no	some green development	max green commercially	focus on impact, cross category approach	long term development plan
Specification (EU GPP or env label exist)	no	some core criteria	core criteria	comprehensive criteria	beyond comprehensive
Specification (no EU GPP or env label)	no	no	requirements to main impacts	requirements to main impacts	requirements to main impacts
Supplier selection and contracting	no	suppliers env plan		supplier audit	
Buying green products	no	no data for choosing green products		green product choices	
Monitoring	no	ad hoc	green agreement marking	supplier reporting	supplier reporting of emissions, CO ₂
Innovation/Use of green technology	no	ad hoc		use of green innovations	precommercial trials for green

Table 18 Green Public Procurement maturity model

The main implication to CB is coined in this maturity model, which shows how to improve GPP by employing more challenging environmental requirements. In addition, frameworks such as the Global Reporting Initiative (GRI) and ISO 14000 (International Standardization Organization, 2009) were identified as well as ready-to-use documents relevant to EU GPP criteria (European Commission). Also, environmental label documents could be used.

4.5. Analyzing local and SME participation in public procurement – evidence from seven Finnish municipalities (Publication V)

For this publication, local and SME procurements in seven municipalities in Finland were investigated. The empirical data were from invoices concerning all procurements. From the supplier data, the industry, the amount of turnover, and whether the supplier had a business location in the municipality, in the neighboring municipalities, in the region, or elsewhere was identified. The share of local procurements and employment effects were developed from that.

The invoice data were connected to suppliers and their addresses to determine the location of the supplier. The location information of the major suppliers was checked using company webpages to determine whether they were located in the municipality.

Usually, the invoicing address was that of the company's headquarters. Companies' postal numbers were also reclassified to a municipality. The judgement used to classify an enterprise as local was based on the type of business. Construction, catering, and cleaning were classified as local, whereas local financial and insurance services were classified as headquarters.

Suppliers were classified into public, third sector, and large, medium, and small enterprises according to EU rules. The turnover of the companies was retrieved from a credit information company.

The calculation process was performed according to the steps shown Figure 13.

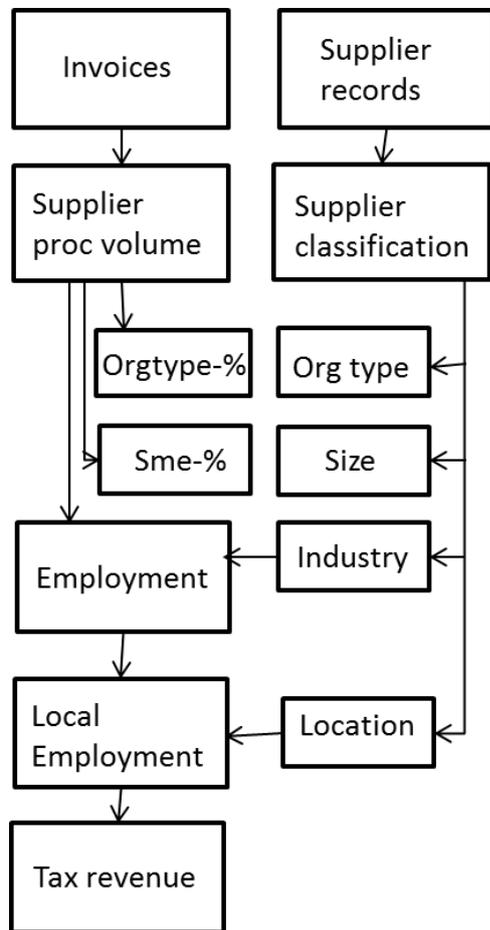


Figure 13 Calculation process for local procurement, employment and tax revenue

The analysis revealed a large share of public organizations in the supplier base (Figure 14). In overall figures it seems that the SMEs' shares of municipal procurements were equal to their shares of GNP.

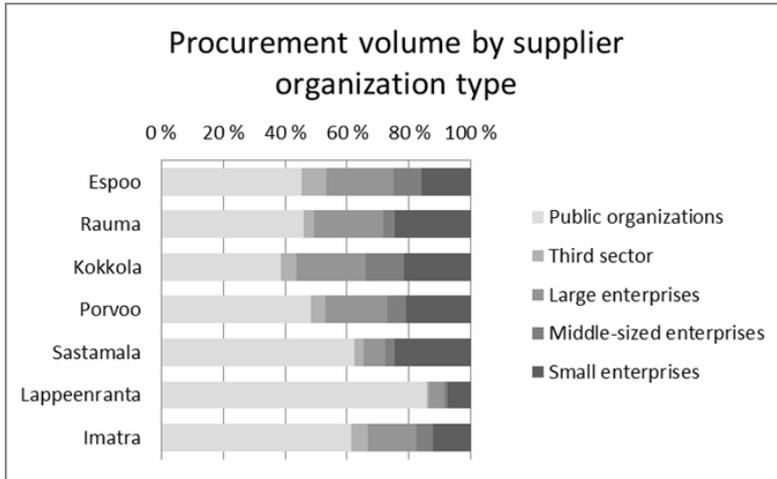


Figure 14. Procurement volume by supplier organization type

The employment effects were heavily concentrated on social and healthcare fields as shown in Figure 15. The suppliers contain both public and private suppliers.

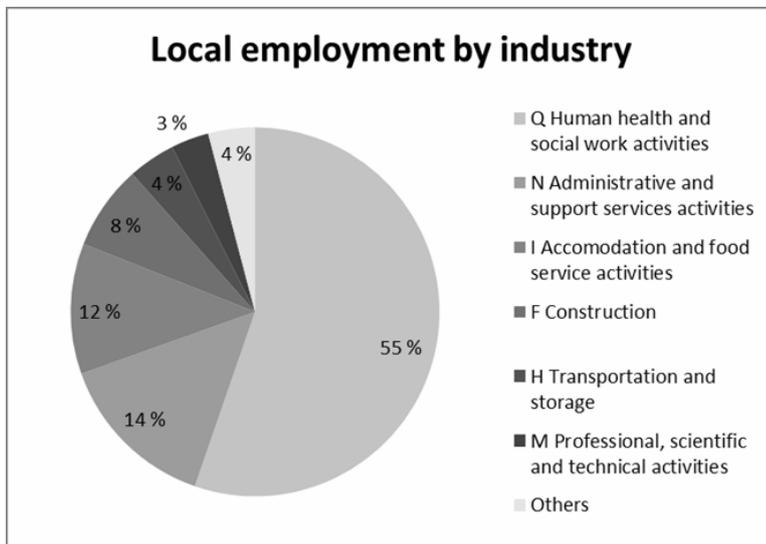


Figure 15 Local employment by industry in the municipality of Sastamala.

In the case of the municipality of Sastamala can be noted that the district hospital is located in the municipality and that the catering and cleaning operations are performed by the publicly owned enterprise.

The implication to Community Benefits is the local share of procurement and its effect on employment. In the case of construction, the impact can be larger if the second-tier suppliers are calculated.

The frameworks identified are those of locally owned local enterprises and nationwide or international enterprises located in the municipality. The results represent the current situation. If the municipalities would employ a local SME-friendly procurement strategy the share of SMEs would be larger.

5. Discussion and Conclusions

5.1. Theoretical contribution

5.1.1. Public procurement in accounting terms

The arguments of publication I first reflect consideration of the spend analysis view of one country by use of a bottom-up model and a calculation procedure. The monetary value was previously calculated by Audet (2002), Bergman (2008), and Konkurrensverket (2015). Audet (2002) pointed out that typical SNA-based calculations omit corporations owned by public entities. Other calculations do not include exceptions from directives, procurements between public entities, and payments that are transferred into PP.

Clear boundaries are defined in publication I for evaluation of the monetary value. Prier and McCue (2009) noted that “public procurement is said to suffer from definitional ambiguity and porous field boundaries, making the application of theory problematic in comparison to mature fields that operate within strict parameters.” More recently it was noted that “reliable statistics on the size of PP in economies around the world are still not available” (World Bank, 2016, p.5).

It was revealed that there is a large amount public procurement coming from in-house or government-to-government providers, usually not governed by the procurement organization. The results of publication I could serve as a conceptual framework for further research.

Arguments are also offered to show a missing area economic environment in public procurement research which could be listed under environment category according to the classification presented by Patrucco et al. (2017).

5.1.2. Multiple scientific silos

The exploratory literature research (Chapter 2.1) exposed the narrow scope of public procurement research in SCM and economically oriented journals. It also noted, based on the definition, that public procurement is made under constructs other than “procurement,” “contracting,” or “commissioning.” A large procurement volume is found in several types of procurement made under “governance models,” usually by an organization that is not focused on procurement.

5.1.3. Using reliable secondary data

This thesis reveals the neglected area of using secondary data. The research methodology handbooks do not recognize this type of quantitative data. The top journals identify datasets in the reference list only when the dataset is ready to use. Procurement volume statistics are retrieved directly from official statistics, but using them requires settings as to which year is represented by the data.

In public procurement researchers use tender data which covers (in the Finnish environment) only 66% of all public procurements. When analyzing invoices the data capture can be higher.

5.1.4. Public procurement of innovations

Publication II is exploratory in nature, but it still gives indications as to the theoretical contribution of this work.

First, from the case basis it can be concluded that there are many innovations in a diffusion phase available, but few are searching for them. An additional problem lies in acknowledgment that these innovations fall under threshold values representing small monetary volume and thus not interesting for commercial players. Dynamic purchasing systems or direct orders for innovative products would help the situation.

Second, national innovation bodies and those seeking financing from the innovation bodies want to make their own innovations. The dual role of innovations is recognized also by Valovirta et al. (2017).

Third, in social and health care organizations there seldom is a developmental department. As described in the work of Yeow and Edler (2012), the Assistant Nursing Director was the developmental organization which was reinforced with a testing team in the later stages of the development. In public entities, innovations are developed or sourced for better public service or lower costs, but in contrast to private companies they do not generate revenue and thus legitimate a larger cost for a Research and Development organization.

Fourth, the theme raised in this publication was related to the customers and their values. Among the studies of public entities there is little focus on customer satisfaction or on details of different customer types. In the work of Yeow and Edler (2012) it was recognized that in the initial phase they did not know the real needs, which in turn had to be revised in the testing phase.

Regarding publication III

The first theoretical contribution has to do with the characteristics of a radical health and social care innovation. Based on the framework of Keeley et al. (2013), a radical innovation could have following qualities. It is usually focused on one disease, and the same organization handles it from beginning to end with better product/service performance. It also uses electronic means as much as possible, but provides also multiple channels to connect with the customer. It supports user empowerment and offers information and a community on the disease. It combines the previous tools for a service

system or value network transferrable to multiple locations. Last, but not least it has ongoing discussions about what customers want.

The second theoretical impact has to do with the categorization of innovation objects:

The innovation sourcing projects related to the technological maturity of the procurement objects can be categorized into six different types. The first type are off-the-shelf innovations (materials, enabling technology). As Rolfstam et al. (2011) and Kivistö et al. (2014) demonstrate, there should be a way of creating access to these innovations, which may be new in other surroundings. In Finnish circumstances one could use a four-year framework agreement for innovations for a particular use or with a performance specification. The other procedure is a dynamic purchasing system especially for procurement volumes over threshold values. Both of these enable time for both early acceptors and late acceptors. The second type is developed service innovations to be used by several entities. These represent lower ambition levels than pre-commercial procurement (PCP), but are likewise diffused to user organizations.

Pre-commercial procurement (PCP) projects make the third type. Subsequently the fourth type is radical PCP projects such as those involving public transport planning software (Kalvet and Lember, 2010). These projects are more challenging, but the rewards are likely to be higher. The fifth category is national service network projects in which the joint procurement unit organizes and sources a service nationally. There are multiple functions within public entities in which centralized or centrally coordinated services would be better or more cost-efficient. Finally, the sixth innovation type is innovation competitions based on broad ideas of what the customers are seeking.

5.1.5. Green public procurement

A contribution to the current theory is made in publication IV by recognizing different procurement process levels of GPP. In the work of Patrucco et al. (2017), reporting and procure-to-pay processes were scarcely or not at all considered. Missing reporting was also mentioned by Testa et al. (2016). The maturity model additionally shows a path to improve GPP from legal compliance to a more advanced level of evaluating environmental measures, involving several process levels. Tools (namely GPP criteria) along with processes are also implicitly recognized in the publication.

5.1.6. Local and SME procurement

It seems that the existence of SME policies in the literature is motivated by innovations, company growth, or the local economy. Many of the authors of previous research seem to motivate SME policies with innovation arguments without criticism. From an SME policy viewpoint SMEs can take their equal share of the public procurement either in competition or in procurement practices under threshold values as shown in the European Common Market studies by NERA (2005), studies conducted in Finland (TEM, 2014), studies conducted in Sweden by Stake (2014), and publication V of this thesis. Measures should be considered that do not exclude SMEs from obtaining their share of the turnover.

As a scientific contribution, a research method was developed using invoice data. This extends the data captured to suppliers under the threshold values and to procurements outside the directives; it also calculates employment effects and local tax effects. This is a step forward in further investigating local economy effects as suggested by Cabras (2011) and in a more recent publication by Abutabenjeh et al. (2018). It also gives a more detailed description of the supply network characteristics than what is found in the existing research and raises the question of in-house suppliers.

5.1.7. Processes and tools

Different kinds of processes and tools for community benefits are described in chapter 4.7. Even though there were a number of articles on processes (Patrucco et al., 2017), they did not provide tools for the individual. The best tools were provided by authors, who were or had been practitioners.

In this thesis a procurement procedure for low-value innovations is noted, usually as existing in the diffusion phase. This is currently neglected by the procurement and research communities.

5.2. Managerial implications

This thesis offers a better understanding of public procurement, as the personnel in public entities have different educational backgrounds. They develop procurement using different scientific silos and scientific constructs: lawyers on legal basis, administrative people based on administrative theories including new public management, engineering emphasizing on how get things done, just to name a few.

The spend analysis reveals the total procurement volume. CBs are normally sought from external suppliers and usually by the general government organization. In-house suppliers represent a great procurement volume and thus a great potential for CB. Procurement departments usually serve the general government entities, but the municipality-owned companies tend to be independent in their procurement decisions. They also represent a large procurement volume and thus a potential for CB.

The GPP maturity model gives a framework for enhancing the environmental effect of public procurement. The monitoring system should be developed from the standpoint of legal compliance to tangible environmental effects, as with measuring CO₂ emissions for example. GPP should also be incorporated into several levels of procurement processes.

Local procurement monitoring reveals the potential of public procurement to the local community with regard to employment potential, especially in construction, social sectors, and healthcare where the impacts to employment are great. SME monitoring can reveal unnecessary centralization in large companies. The problem can be tackled by having a category management view of the area and judging what parts can be performed

by SMEs. In the sourcing process, the RFP material could be designed to be friendlier to SMEs by having a low threshold turnover or requiring a small amount of references in a longer time.

The repository of innovation frameworks can help practitioners identify constructs and develop applications by looking at procurement objects in view of the frameworks.

5.3. Limitations

All research has been conducted under the legislative framework of the European Union. Although the objectives of public procurement are likely to be similar to those in other legislative frameworks, the outcomes could be different. Also, as noted in publication I, the publication is a second version and data collection was initially made in 2013 using statistics and annual reports. Since that year, the SNA has been revised and can now give better data concerning public procurement. Later on, there may be classification errors in central government enterprises in that respect, as well as whether they should apply PP regulations.

The economic and management silos have been explored in this thesis. Other scientific silos still need to be studied and evaluated.

5.4. Further research directions

Further research can be directed to the large proportion of in-house and other government-to-government procurements.

As the spend analysis shows, there is a need to pursue other types of boundary setting or classification studies concerning public procurement. A practical example could be a transactional analysis of public procurement showing how many and what types of business transactions are made on a national level. That could reveal the amount of clerical work associated with the sourcing and procure-to-pay levels.

The exploratory literature review showed the directions for more comprehensive and specified reviews. Examples could be a comprehensive review of legal journals from Europe, the US, and other places concerning public procurement regulations and relevant sub-topics. Another entry in legal journals could be a deeper analysis of RFP and contract contents, such as the different chapters explained in *Buying Green, third edition* (European Commission 2016). Another literature review could be on public procurement in administrative sciences from a broader scope than PPP (Wang et al., 2018). A fourth view could be directed at investigating all types of construction, beyond PPP (Ke et al., 2009), technology procurement, and ICT procurement.

SME policy seems to be part of a political agenda because SMEs represent 99.8% of all enterprises (in Finland) (OSF1) and their managers are voters. There should be further research on whether procurement from SMEs is beneficial due to economic reasons other

than just competition. Further on there could be research to answer, “What is a healthy competitive environment?” in relation to in-house production, large enterprises, and SMEs.

Innovation frameworks present some of the constructs and taxonomies in social sciences. There are also legal innovations such as PPP and alliance models as examples. Other types of innovations may be revealed.

References

- Abutabenjeh, S., Gordon, S., Mengistu, B., 2018. The impacts of in-state procurement preference policies on the economy of South Carolina. *Journal of Public Procurement*, 18, 3, pp. 240–256.
- Act on Openness of Government Activities (621/1999)
https://www.finlex.fi/en/laki/kaannokset/1999/en19990621_20150907.pdf
 [accessed 12.8.2020]
- Alhola, K., Nissinen, A. 2018. Integrating cleantech into innovative public procurement process—evidence and success factors. *Journal of Public Procurement*, 18, 4, 336–354.
- Al-Tabbaa, A., 2016. The ex-ante and ex post application of the Teckal criteria for in-house awards. *European Procurement & Public-Private Partnership Law Review*, 11, 3, 166–178.
- Alvarez, S., Rubio, A., 2015. Carbon footprint in green public procurement: A case study in the services sector. *Journal of Cleaner Production*, 93, pp. 159–166.
- Amann, M., Roehrich, J.K., Essig, M., Harland, C., 2014. Driving sustainable supply chain in the public sector. *Supply Chain Management, An International Journal*, 19, 3, 351–366.
- Ancarani, A., Di Mauro, C., Hartley, T., Tátrai, T., 2019. A Comparative Analysis of SME Friendly Public Procurement: Results from Canada, Hungary and Italy. *International Journal of Public Administration*, 42, 43, 1106–1121
- Andreasson S, Winge M., 2010. Innovations for sustainable social and health care, Vinnova report 2010:
- Andersson R.D., Pelletier, P., 2016. The government procurement chapter of the Trans-Pacific partnership agreement: An assessment of its potential impact. *European Procurement & Public-Private Partnership Law Review*, 11, 4, 270–291.
- Andrecka, M., 2015a. Innovation partnership in the new public procurement regime—A shift of focus from procedural to contractual issues? *Public Procurement Law Review*, 2015, 2, 48–62.
- Andrecka, M., 2015b. Framework agreements: Transparency in the call-off award process. *European Procurement & Public Private Partnership Law Review*, 10, 4, 231–242.
- Apte, A., Arruda, C., Clark, A., Landale, K., 2019. Implementing category management of services—a new methodology. *Journal of Public Procurement*, 19, 2, 165–183.
- Arden, P., 2013. Legal regulation of multi-provider framework agreements and the potential for bid rigging: A perspective from the UK local government construction sector. *Public Procurement Law Review*, 2013, 5, 165–182.
- Arksey, H., Baxter, K., 2012. Exploring the temporal aspects of direct payments. *British Journal of Social Work*, 42, 147–164.
- Arlbjørn, J.S., Freytag, P.V., 2012. Public procurement vs private purchasing: Is there any foundation for comparing and learning across the sectors? *International Journal of Public Sector Management* 25, 3, 203–220.

- Arrowsmith, S., 2010. Horizontal policies in public procurement: A taxonomy. *Journal of Public Procurement*, 10, 2, 149–186.
- Arrowsmith, S., 2017. The implications of Brexit for public procurement law and policy in the United Kingdom. *Public Procurement Law Review*, 2017, 1, 1–33.
- Audet, D., 2002. Government procurement 2002. A synthesis report. *OECD Journal on Budgeting*, 2 3, 149–194.
- Bartle, J.R., Korosec R.L., 2003. A review of state procurement and contracting. *Journal of Public Procurement*, 3, 2, 192–214.
- Basheka, B.C., 2008. Procurement planning and accountability of local government procurement systems in developing countries: Evidence from Uganda. *Journal of Public Procurement*, 8, 3, 379–406.
- Bergman, M., 2008. Offentlig upphandling och offentliga inköp – omfattning och sammansättning (in Swedish). Research report for the Swedish Competition Agency. http://www.konkurrensverket.se/globalassets/publikationer/uppdraagsforskning/orsk_rap_offentliga_inkop.pdf [Retrieved February, 2, 2015].
- Beverland, M., Lindgreen, A 2010. What makes a good case study? A positivist review of qualitative case research published in *Industrial Marketing Management*, 1971–2006, *Industrial Marketing Management* 39, 56–63.
- Bickerstaff, R., 2014. E-procurement under the new EU procurement directives. *Public Procurement Law Review*, 2014, 3, 134–147.
- BIS, 2011. Delivering best value through innovation. Forward Commitment Procurement Practical Pathways to Buying Innovative Solutions. Department for Business, Innovation & Skills.
- Borson, F., 2017. Reforms under the World Bank procurement and the policy implications in developing countries. *European Procurement & Public Private Partnership Law Review*, 12, 2, 146–154.
- Bouwer, M., de Jong, K., Jonk, M., Berman, T., Bersani, R., Lusser, H., Nissinen, A., Parikka, K., and Szuppinger, P., 2005. Green public procurement in Europe 2005—Status overview. *Virage Milieu & Management* 2011. AJ Haarlem, The Netherlands. Available from: <http://europa.eu.int/comm/environment/gpp/media.htm#state>.
- Bouwer, M., Jonk, M., Berman, T., Bersani, R., Lusser, H., Nappa, V., Nissinen, A., Parikka, K., Szuppinger, P., Viganò, C., 2006. Green public procurement in Europe 2006— conclusions and recommendations. In: K. Spaarne (Ed.). *Virage Milieu & Management*. AJ Haarlem, The Netherlands. Available from: http://ec.europa.eu/environment/gpp/pdf/take_5.pdf
- Brammli-Greenberg, S., Weitzberg, R., Perman, V., Gamzu, R. 2016. Why and how did Israel adopt activity-based hospital payment? The Procedure Related Group incremental reform. *Health Policy*, 120, 1171–1176.
- Bratt, C., Hallstedt, S, Robèrt, K-H. , Broman, G., Oldmar, J., 2013. Assessment of criteria development for public procurement from a strategic sustainability perspective. *Journal of Cleaner Production*, 52, 309–316.

- Brem, A., Voigt, K.-I., 2009. Integration of market pull and technology push in the corporate front end and innovation management—Insights from the German software industry, *Technovation* 29, 351–367.
- Brodec, J., Janeček, V., 2015. How does the substantial modification of a public contract affect its legal regime? *Public Procurement Law Review*, 2016, 3, 90–105.
- Brutscher, P.-B. Cave, J., Grant, J., 2009, “Innovation procurement,” RAND National Defense Research Institute, RAND, Santa Monica, CA, available at: www.rand.org/content/dam/rand/pubs/documented_briefings/2009/RAND_DB580.pdf
- Bryman, A., Bell, E 2015: *Business Research Methods*, fourth ed. Oxford, Oxford University Press.
- Burrell and Morgan, 1979. *Sociological Paradigms and Organisational Analysis*. Heinemann, London.
- Cabral, L., Cozzi, G., Denicolo, V., Spagnolo, G., Zanza, M., 2006, “Procuring innovations,” in Dimitri, N., Piga, G. and Spagnolo, G. (Eds.) *Handbook of Procurement*, Cambridge University Press, Cambridge, pp. 483–529.
- Cabras, I., 2011. Mapping the Spatial Patterns of Public Procurement. *International Journal of Public Sector Management*, 24 (3): 187–205.
- Cambridge, P., Carpenter, J., Forrester-Jones, R., Tate, A., Knapp, M., Beecham, J., Hallam, A., 2005. The state of care management in learning disability and mental health services 12 years into community care. *British Journal of Social Work*, 35, 1039–1062.
- Carbonara, N., Pellegrino, R., 2018. Fostering innovation in public procurement through Public Private Partnerships. *Journal of Public Procurement* 18, 3, 257–280.
- Carmen Sánchez-Carreira, M. del, Peñate-Valentín, M.C., Varela-Vázquez, P., 2019. Public procurement of innovation and regional development in peripheral areas. *Innovation: The European Journal of Social Science Research*, 32:1, 119–14.
- Carter, C.R., Jennings, M.M., 2002. Logistics social responsibility: An integrative framework. *Journal of Business Logistics*, 23, 1, 145–180.
- Carter, C.R., Rogers, D.S., 2008. A framework of sustainable supply chain management: Moving toward new theory. *International Journal of Physical Distribution & Logistics Management*, 38, 5, 360–387.
- Cernat, L., Kutlina-Dimitrova, Z., 2015. International public procurement: From scant facts to hard data. Chief Economist Note, EC Trade, Issue 1. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2682582 [Retrieved January, 1, 2017].
- Cerutti, A.K., Contu, S., Ardente, F., Donno, D., Beccaro, G.L., 2016. Carbon footprint in green public procurement: Policy evaluation from a case study in the food sector. *Food Policy*, 58, 82–93.
- Cheon, M.J., Groven, V., Sabherwal, R., 1993. The evolution of empirical research in IS: A study in IS maturity. *Information & Management*, 24(3): 107–119.

- Chester, H., Hughes, J., Challis, D., 2010. Patterns of commissioning, contracting and care management in social care services for older people in England. *British Journal of Social Work*, 40, 2523–2537.
- Cogburn, J.D., 2003. Exploring differences in the American states' procurement practices. *Journal of Public Procurement*, 3 (1), 3–28.
- Cogburn, J.D., Rahm, D., 2005. Environmentally preferable purchasing: Who is doing what in the United States? *Journal of Public Procurement*, 5, 1, 23–53.
- Considine, M., Lewis, J.M., 2003. Bureaucracy, network or enterprise? Comparing models of governance in Australia, Britain, the Netherlands and New Zealand. *Public Administration Review*, 63 (2): 131–140.
- Cox, A., Chicksand, D., Ireland, P., 2005. Overcoming demand management problems: The scope for improving reactive and proactive supply management in the UK health service. *Journal of Public Procurement*, 5, 1, 1–22.
- Curto, S., Ghislandi, S., van de Vooren, K., Duranti, S., Garattini, L., 2014. Regional tenders on biosimilars in Italy: An empirical analysis of awarded prices. *Health Policy*, 116, 1–2, 182–187.
- Dagiliute, R., Anikanova, K., 2011. Green public procurement in Lithuania: Volumes and possibilities for environmental impact reduction. *Environmental Engineering, Research and Management*, 4 (58), 42–47.
- De Quesada, C. E., 2014. Competition and transparency in public procurement markets. *Public Procurement Law Review*, 2014, 5, 229–244.
- Douglas, A., 2017. Product output based specifications. Best Practice Report. SPP regions, ICLEI.
- Dubois, P. H., Ezzeddin, P., Swan, K. D., 2016. Suspension and debarment on the international stage: Experiences in the World Bank's sanctions system. *Public Procurement Law Review*, 2016, 3, 61–70.
- Edler, J., Georghiou, L., 2007. Public procurement and innovation—Resurrecting the demand side. *Research Policy*, 36, 949–963.
- Edquist, C., 2009. Public Procurement for Innovation (PPI) – A pilot study, Centre for Innovation, Research and Competence in the Learning Economy (CIRCLE), Paper no. 13/2009.
- Eikelboom, M.E., Gelderman, C., Semeijn, J., 2018. Sustainable innovation in public procurement: The decisive role of the individual. *Journal of Public Procurement*, 18, 3, 190–201.
- Erridge, A. 2007. Public Procurement, Public Value and The Northern Ireland Unemployment Pilot Project. *Public administration (London)*, 85, 4, 1023-1043
- European Commission Working Group. 2006. Pre-commercial procurement of innovation: A missing link in the European innovation cycle. Working group report.
- European Commission, 2008. Public procurement for a better environment.
- European Commission, 2011. *Buying Green: A Handbook on Green Public Procurement*, second ed., European Commission.
- European Commission, 2014. DIRECTIVE 2014/24/EU.
- European Commission, 2016a. Public Procurement Indicators 2015, Retrieved from <http://ec.europa.eu/DocsRoom/documents/20679>.

- European Commission, 2016b. *Buying Green*, third edition.
- European Commission, EU climate action and the European Green Deal https://ec.europa.eu/clima/policies/eu-climate-action_en [retrieved 14.8.2020]
- European Commission, EU GPP criteria https://ec.europa.eu/environment/gpp/eu_gpp_criteria_en.htm [retrieved 2.1.2020].
- Evans, S., Hills, S., Orme, J., 2012. Doing more for less? Developing sustainable systems of social care in the context of climate change and public spending cuts. *British Journal of Social Work*, 42, 744–764.
- Eyo, A., 2017. Evidence on use of dynamic purchasing systems in the United Kingdom. *Public Procurement Law Review*, 2017, 6, 237–248.
- Farneti, F., Padovani, E., Young, D.W., 2010. Governance of outsourcing and contractual relationships, in Osborne (ed.): *The New Public Governance?* London and New York: Routledge.
- Fet, A., Michelsen, O., de Boer, L. 2011. Green public procurement in practice—The case of Norway. *Society and Economy* 33 (1), 183-198.
- Flynn, A., Davis, P., McKeivitt, D., McEvoy, E., 2013. Mapping public procurement in Ireland. *Public Procurement Law Review*, 2013, 2, 74–95.
- Flynn, A., Davis, P., 2014. Theory in public procurement research. *Journal of Public Procurement*, Vol 4, Issue 2, 139–80.
- Flynn, A., Davis, P., 2015. “The rhetoric and reality of SME-friendly procurement.” *Public Money & Management*, 35 (2): 111–118.
- Flynn, A., McKeivitt, D., Davis, P., 2015. The impact of size on small and medium-sized enterprise public sector tendering. *International Small Business Journal*, 33 (4): 443–461.
- Gao, F., 2013. Building up SME programmes in government procurement in China: Legal structure, recent developments and the way forward towards the WTO–GPA. *Public Procurement Law Review*, 2013, 6, 211–224.
- Garcia-Andrade, X., 2015. Past and present of the Spanish public contract modification regime. *European Procurement & Public–Private Partnership Law Review*, 10, 3, 164–170.
- Gioia, D., Corley, K., Hamilton, A., 2013. Seeking qualitative rigor in inductive research: Notes on the Gioia methodology. *Organizational Research Methods*, 16 (1), 15–31.
- Giunipero L.C., Hooker, R.E., Denslow, D., 2012. Purchasing and supply management sustainability: Drivers and barriers. *Journal of Purchasing & Supply Management* 18, 258–269.
- Glas, A.H., Essig, M., 2018. Factors that influence the success of small and medium-sized suppliers in public procurement: Evidence from a centralized agency in Germany. *Supply Chain Management: An International Journal*, 23, 1, 65–78.
- Global Reporting Initiative: G4 Sustainability Reporting Guidelines, Reporting Principles and Standard Disclosures. www.globalreporting.org.

- Golafshani, N., 2003. Understanding Reliability and Validity in Qualitative Research. *The Qualitative Report*, 8, 4, 597-606. Retrieved from <https://nsuworks.nova.edu/tqr/vol8/iss4/6> [retrieved 9.4.2020]
- Gomes, P.C., 2014. The innovative innovation partnerships under the 2014 Public Procurement Directive. *Public Procurement Law Review*, 2014, 4, 211–218.
- Gorski, J., 2016. The World Bank’s new procurement regulations. *European Procurement & Public–Private Partnership Law Review*, 11, 4, 301–310.
- Gu, D., Sautter, J., Huang, C., Zeng, Y., 2011. Health inputs and cumulative health deficits among the older Chinese. *Social Science & Medicine*, 72(5), 806–814.
- Halonen, K.–M., 2015. Shielding against damages for ineffectiveness: The limitations of liability available for contracting authorities—a Finnish approach. *Public Procurement Law Review*, 2015, 4, 111–121.
- Halonen, K.–M., 2017. Termination of a public contract—lifting the veil on art. 73 of 2014/24 Directive. *Public Procurement Law Review*, 2017, 4, 187–199.
- Hamer, C. R., 2014. Regular purchases and aggregated procurement: The changes in the new Public Procurement Directive regarding framework agreements, dynamic purchasing systems and central purchasing bodies. *Public Procurement Law Review*, 2014, 4, 201–210.
- Harland, C., Qatami, L., Warrington, J., 2007. Concept of evidence–based public procurement, Proceedings of 16th Annual IPSERA Conference, Bath UK, April 1–4.
- Hartlev, K., Liljenbøl, M.W., 2013. Changes to existing contracts under the EU public procurement rules and the drafting of review clauses to avoid the need for a new tender. *Public Procurement Law Review*, 2013, 2, 51–73.
- Heijboer, G., Telgen, J., 2002. Choosing the open or the restricted procedure: A big deal or a big deal? *Journal of Public Procurement*, 2, 2, 187–215.
- Hellowell, M., 2013. PFI Redux? Assessing a new model for financing hospitals. *Health Policy*, 113, 1–2, 77–85.
- Helsinki City, Open invoice data [<https://hri.fi/data/fi/dataset//helsingin-kaupungin-ostot>]
- Hindess, B., 1973. *The Use of Official Statistics in Sociology: A Critique of Positivism and Ethnomethodology*, London, Palgrave MacMillan.
- Hippel, E. von, 1988. *The Sources of Innovation*, Oxford, Oxford University Press.
- Hoejmose, S.U., Adrien–Kirby, A.J., 2012. Socially and environmentally responsible procurement: A literature review and future research agenda of a managerial issue in the 21st century. *Journal of Purchasing and Supply Management*, 18, 4, 232–242.
- Hoepfl, M. C. 1997. Choosing qualitative research: A primer for technology education researchers. *Journal of Technology Education*, 9(1), 47-63.
- Hoepner, A.G.F., Kant, B., Scholtens, B., Yu, P.–S., 2012. Environmental and ecological economics in the 21st century: An age adjusted citation analysis of the influential articles, journals, authors and institutions. *Ecological Economics*, May 2012, Vol.77.
- Hommen, L., Rolfstam, M., 2009. Public Procurement and Innovation – Towards a taxonomy. *Journal of Public Procurement*, 9, 1, 17–56.

- Igarashi, M., Boer, L. de, Pfuhl, G., 2017. Analyzing buyer behavior when selecting green criteria in public procurement. *Journal of Public Procurement*, 17, 2, 141–186.
- International Monetary Fund (2014), *Government Finance Statistics Manual 2014*, IMF, Washington, DC, D.C.
- International Standardization Organisation, 2009. Environmental Management: The ISO 14000 family of International Standards, ISO Central Secretariat; Geneva.
- International Standardization Organisation, 2010, ISO 26000 standard, <https://www.iso.org/iso-26000-social-responsibility.html>.
- International Trade Center, <https://sustainabilitymap.org> [accessed 6.1.2020].
- Iossa, E., Biagi, F., Valbonesi, P., 2018. Pre-commercial procurement, procurement of innovative solutions and innovation partnerships in the EU: rationale and strategy. *Economics of Innovation and New Technology*, 27, 8, 730-749
- Ippolito, A.E., 2014. Government to government contracts in EU defence procurement. *Public Procurement Law Review*, 2014, 6, 249–265.
- Järvensivu, T., Törnroos, J.-Å., 2010. Case study research with moderate constructionism: Conceptualization and practical illustration. *Industrial Marketing Management*, 39, 100–108.
- Jones, D.S., 2011. Recent reforms to promote social responsibility procurement in East Asian States: A comparative analysis. *Journal of Public Procurement*, 11, 1, 61–94.
- Kalvet, T., Lember, V., 2010. Risk management in public procurement for innovation: The case of Nordic–Baltic Sea cities. *Innovation – The European Journal of Social Science Research* 23, 3, 241–262.
- Karjalainen, K., Kemppainen, K., 2008. The involvement of small- and medium-sized enterprises in public procurement: Impact of resource perceptions, electronic systems and enterprise size. *Journal of Purchasing & Supply Management*, 14: 230–240.
- Karlsson, C. ed., 2016. *Research methods for Operations Management*, second ed., Routledge, Oxon, UK.
- Ke, Y., Wang, S., Chan, A.P.C., Cheung, E., 2009. Research trends of public-private partnership in construction journals. *Journal of Construction Engineering and Management*, 135 (10), 1076–1086.
- Keeley, L., Pikkal, R., Quinn, B., Walters, H., 2013. *Ten Types of Innovation*, Hoboken, NJ, John Wiley & Sons.
- Kidalov, M., & Snider, K., 2011. US and European Public Procurement Policies for Small and Medium-Sized Enterprises (SME): A Comparative Perspective. *Business and Politics*, 13 (4). Article 2.
- Kidalov, M., Snider, K., 2013. Once more, with feeling: Federal small business contracting policy in the Obama administration. *Public Procurement Law Review*, 2013, 1, 15–40.
- Kihn, L.-A., Ihantola, E.-M., 2015. Approaches to validation and evaluation in qualitative studies of management accounting. *Qualitative Research in Accounting & Management* 12, 3, 230-255

- Kirkman–Liff, B.L., Huijsman, R., van der Grinten, T., Brink, G., 1997. Hospital adaptation to risk-bearing: Managerial implications of changes in purchaser-provider contracting. *Health Policy*, 39, 207–223.
- Kivistö, T., Grudinschi, D., Hallikas, J., Sintonen, S., 2014. Innovative procurement processes and their use in social and healthcare sector, International Public Procurement Conference, Dublin 2014.
- Kivistö, T., Virolainen, V.M., 2019. Public procurement spend analysis at a national level in Finland. *Journal of Public Procurement*, 19, 2, 108–112.
- Klasa, K., Greer, S., van Ginneken, E., 2018. Strategic purchasing in practice: Comparing ten European countries. *Health Policy* <https://doi.org/10.1016/j.healthpol.2018.01.014>.
- Koala, K., Steinfeld, J., 2018. Theory building in public procurement. *Journal of Public Procurement*, 18, 4, 282–305.
- Koivisto, J., 2018. Co-designing an outcome-based public procurement: Early involvements, participations and orderings. *Journal of Public Procurement* 18, 4, 323–335.
- Konkurrensverket, 2015. “Siffror och fakta om offentlig upphandling (in Swedish),” Report 2015:9, Konkurrensverket och Upphandlingsmyndigheten, Stockholm, available at: http://www.konkurrensverket.se/globalassets/publikationer/rapporter/rapport_2015-9.pdf (accessed 5 January 2017).
- Kornecki, 2011. Small and medium-sized enterprises on the public procurement market in Poland. *Equilibrium*, 6 (2): 23–45.
- Kunzlik, P., 2013. From suspect practice to market-based instrument: Policy alignment and the evolution of EU law’s approach to “green” public procurement. *Public Procurement Law Review*, 2013, 3, 97–115.
- La Chimia, A., Valaguzza, S., 2017. A new approach to implementing the 2014 public procurement directives in Italy: ANAC’s soft law regulatory powers amidst uncertainty and need for clarity. *Public Procurement Law Review*, 2017, 4, 165–186.
- Laffont, J., Tirole, J., 1993. *A Theory of Incentives in Regulation and Procurement*, MIT Press, Cambridge.
- Lahdenperä, P., 2009. Project alliance: The cost competitive single target cost. VTT Research Notes 2472, <http://www.vtt.fi> [accessed 12.12.2019].
- Lange, S., Telgen, J., Schotanus, F., 2014. Systematic review of 16 years of scientific literature on public procurement. International Public Procurement Conference, Dublin 2014.
- Larson, P.D., 2009. Public vs. Private Sector Perspectives on Supply Chain Management. *Journal of Public Procurement*, 9, 2, 222–247.
- Lenferink, S., Arts, J., Tillema, T., van Valkenburg, M., Nijsten, R., 2017. Early contractor involvement in Dutch infrastructure development: Initial experiences with parallel procedures for planning and procurement. *Journal of Public Procurement* 12, 1, 1–42.

- Leonard-Barton, D., 1990, A dual methodology for case studies: Synergistic use of longitudinal single site with replicated multiple sites. *Organisation Science*, 16, 1, 248–266.
- Lincoln, Y.S. and Guba, E.G. 1985, *Naturalistic Inquiry*, Sage, Beverly Hills, CA
- Lindeiner, F. von, 2016. The new procurement rules of the European Central Bank. *Public Procurement Law Review*, 2016, 5, 213–223.
- Loader, K., 2011. Are public sector procurement models and practices hindering small and medium suppliers? *Public Money & Management*, 31 (4): 287–294.
- Loader, K., 2013. Is public procurement a successful small business support policy? A review of the evidence. *Environment and Planning C: Government and Policy*, 31, 39–55.
- Loader, K., 2015. SME suppliers and the challenge of public procurement: Evidence revealed by a UK government online feedback facility. *Journal of Purchasing & Supply Management*, 21: 103–112.
- Loader K, Norton, S., 2015. SME access to public procurement: An analysis of the experiences of SMEs supplying the publicly funded UK heritage sector. *Journal of Purchasing & Supply Management*, 21: 241–250.
- Lynch, J., Harland, C., Walker, H., 2019: Leveraging social procurement to deliver public value through community benefits clauses, in Lindegren, A., Koenig–Lewis, N., Brewer, J.D., Moore, M.H., Meynhardt T. (eds): *Public Value, Deepening, Enriching, and Broadening the Theory and Practise*, 112–139, Oxon, Routledge.
- Mamavi, O., Nagati, H., Wehrle, F., Pache, G., 2014. Out of sight, out of mind? Supplier spatial proximity in French public procurement. *International Journal of Public Sector Management*, 27 (6): 486–500.
- Mathison, S. 1988. Why triangulate? *Educational Researcher*, 17(2), 13-17
- McCrudden, C., 2004. Using public procurement to achieve social outcomes. *Natural Resources Forum*, 28, 257–267.
- McCue, C.P., Gianakis, G.A., 2001. Public purchasing: Who’s minding the store? *Journal of Public Procurement*, 1, 1, 71–95.
- McKevitt, D., Davis, P., 2013. Microenterprises: How they interact with public procurement processes. *International Journal of Public Sector Management*, 26 (6): 469–480.
- McKevitt, D., Davis, P., 2015. How to interact, when and with whom? SMEs and public procurement. *Public Money & Management*, 35:1, 79–86.
- Monczka, R.M., Carter, P.L., Scannel, T.V, Carter, J.R., 2010. *Implementing Supplier Innovation: Case Study Findings*, Tempe, AZ, CAPS Research.
- Morgan, G., Smircich, L., 1980. The case for qualitative research. *Academy of Management Review*, 5, 4, 491–500.
- [Murray, J.G.](#) (2007), "Strategic procurement in uk local government: The role of elected members", *Journal of Public Procurement*, 7, 2, 194-212.
- Mwesiumo, D., Olsen, K.M., Svenning, G.A., Glavee–Geo, R., 2019. Implementing public procurement of innovations in an organization: Lessons from Norway. *Journal of Public Procurement* 19, 3, 252–274.

- Myerson, R., 2017. Political economics in the journal of political economy: Six landmark papers. *Journal of Political Economy*, 125(6), 1752–1756.
- NERA, 2005. A Study of the Benefits of Public Sector Procurement. [Online]. Available <http://www.nera.com/publications/archive/2005/a-study-of-the-benefits-of-public-procurement-from-small-business.html> [Retrieved April 12, 2016].
- Nicholas, C., Fruhmann, M., 2014. Small and medium-sized enterprises policies in public procurement: Time for a rethink? *Journal of Public Procurement*, 14 (3): 328–360.
- Nielsen, H. K., 2017. Labour clauses in public contracts: ILO Convention no. 94 in the European Union after RegioPost. *Public Procurement Law Review*, 2017, 5, 201–219.
- Nijaki, L., Worrel, G., 2012. Procurement for Sustainable Local Economic Development. *International Journal of Public Sector Management*, 25 (2): 133–153.
- Nijboer, K., Senden, S., Telgen, J. 2017. Cross-country learning in public procurement: An exploratory study. *Journal of Public Procurement* 17, 4, 449–482.
- Nijssen, E., Hillebrand, B., Vermeulen, P., Kemp, R., 2006. Exploring product and service innovation similarities and differences. *International Journal of Research in Marketing*, 23, 241–251.
- Novak R.M., Sthultz, T.T., Reed, T.S., Wood, C.C., Kirstein, J.A., Whittle, J.A., 2004. Evolutionary acquisition: An analysis of defense procurement and recommendations for expanded use. *Journal of Public Procurement* 4, 2, 238–267.
- O’Brian J., 2012. *Category Management in Purchasing*, London, Kogan Page, 2nd edition
- OECD 2005, *Oslo Manual, Guidelines For Collecting and Interpreting Innovation Data*, third ed., Paris, OECD Publishing.
- OECD 2015. *Size of public procurement, in Government at a Glance 2015*, Paris, OECD Publishing.
- Oliveira, M., 2017. Techniques and instruments for aggregated procurement in the new EU directives: Framework agreements and dynamic purchasing systems. *European Procurement & Public-Private Partnership Law Review*, 12, 2, 177–182.
- Olivera, R., 2015. Modification of public contracts. *European Procurement & Public-Private Partnership Law Review*, 10, 1, 35–49.
- Oruezabala, G., Rico, J.C., 2012. The impact of sustainable public procurement on supplier management—The case of French public hospitals. *Industrial Marketing Management* 41, pp. 573–580.
- Panasiuk, A., Jarocki, L., 2017. The court of justice of the European Union and its influence on European and national public procurement regulations: The case of Poland. *European Procurement & Public-Private Partnership Law Review*, 12, 2, 192–200.

- Patrucco, A.S., Luzzini, D., Ronchi, S., 2016. Evaluating the effectiveness of public procurement performance management systems in local governments. *Local Government Studies*, 42:5, 739–761.
- Patrucco, A.S., Luzzini, D., Ronchi, S., 2017. Research perspectives on public procurement: Content analysis of 14 years of publications in the *Journal of Public Procurement*. *Journal of Public Procurement*, Vol 17, Issue 2, 229–269.
- Patton, M. Q. 2002. *Qualitative evaluation and research methods* (3rd ed.). Thousand Oaks, CA: Sage Publications, Inc
- Pedersen, K., Olsson, E., 2013. Case comment: Azienda—The creation of an exemption from public procurement law. *Public Procurement Law Review*, 2013, 6, 225–235.
- Pegnato, J.A., 2003. Assessing federal procurement reform: Has the procurement pendulum stopped swinging? *Journal of Public Procurement*; 2003; 3, 2.
- Penno, E., Gauld, R., 2017. The role, costs and value for money of external consultancies in the health sector: A study of New Zealand’s District Health Boards. *Health Policy*, 121, 4, 458–464.
- PricewaterhouseCoopers, 2009. *Collection of statistical information on Green Public Procurement in the EU*.
- PriceWaterhouseCoopers, 2014. *SMEs’ Access to Public Procurement Markets and Aggregation of Demand in the EU (A Study Commissioned by the European Commission, DG Internal Market and Services)*. [Online]. Available at http://ec.europa.eu/internal_market/public_procurement/docs/modernising_rules/smes-access-and-aggregation-of-demand_en.pdf. [Retrieved March 14, 2016]
- Prier, E., McCue, C., 2009. The implications of a muddled definition of public procurement. *Journal of Public Procurement*, 9 3/4, 326–370.
- Priestley, M., Jolly, D., Pearson, C., Ridell, S., Barnes, C., Mercer, G., 2007. Direct payments and the disabled people in the UK: Supply, demand and devolution. *British Journal of Social Work*, 37, 1189–1204.
- Putten, M. van, 2012. *Leading public innovation procurement*, 5th International Public Procurement Conference, Portland.
- Qiao, Y., Thai, K.V., Cummings, G., 2009. State and local procurement preferences: A survey. *Journal of Public Procurement* 9, 3 & 4, 371–410.
- Rackiewicz, Z., 2016. Public procurement within the framework of the transatlantic trade and investment partnership. *European Procurement & Public–Private Partnership Law Review*, 11, 4, 263–269.
- Rainville, A., 2016. From whence the knowledge came: Heterogeneity of innovation procurement across Europe. *Journal of Public Procurement* 16, 4, 463–504.
- Randall, T.A., Brothers, H.S., Holt, D.T., 2004. Evaluation Of Competitive Sourcing Performance Work Statement Metrics, *Journal of Public Procurement*, 4, 2, 210–237
- Reich, A., Shabat, O., 2014. The remedy of damages in public procurement in Israel and the EU: A proposal for reform. *Public Procurement Law Review*, 2014, 2, 50–77.

- Renda, A., Pelkmans, J., Egenhofer, C., Schrefler, L., Luchetta, G., Selçuki, C., Ballesteros, J., Zirnhelt, A.–C., 2012. The uptake of green public procurement in the EU27, Center for European Policy Studies and College of Europe, Brussels Available <http://ec.europa.eu/environment/gpp/pdf/CEPS-CoE-GPP%20MAIN%20REPORT.pdf> (accessed 3.10.2016).
- Rendon, R.G., 2008. Procurement process maturity: Key to performance measurement. *Journal of Public Procurement*, 8, 2, 200–214.
- Rolfstam, M., Phillips, W., Bakker, E., 2011. Public procurement of innovations, diffusion and endogenous institutions. *International Journal of Public Sector Management*, 24, 5, 452–468.
- Schiele, H., 2010. Early supplier integration: The dual role of purchasing in new product development. *R&D Management*, 40, 2, 138–153.
- Schoenmakers, S., 2016. The EU debarment rules: Legal and economic rationale. *Public Procurement Law Review*, 2016, 3, 91–104.
- Schumpeter, J.A., 1939. *Business cycles: A Theoretical, Historical and Statistical Analysis of the Capitalist Process*. McGraw-Hill, New York.
- Scopus, 2017. Scopus Source List. Retrieved from <https://www.elsevier.com/solutions/scopus/resource-library>.
- Sebastian, R.J., Davison, B., 2011. The root causes of contract administration problems. *Journal of Public Procurement*, 11, 2, 171–189.
- Sellick, C., 2006. Opportunities and risks: Models of good practice in commissioning foster-care. *British Journal of Social Work*, 36, 1345–1359.
- Sharma, V., 2016. An update on procurement reforms at the African Development Bank. *Public Procurement Law Review*, 2016, 4, 151–163.
- Siciliani, L., Chalkley, M., Gravelle, H., 2017. Policies towards hospital and GP competition in Five European Countries. *Health Policy*, 121, 103–110.
- Sintonen, S., Grudinski, D., Hallikas, J., Kivistö, T., Hämäläinen, J., Frimodig, A., Kaikko, K., Kettunen, M., 2014. *Value-driven innovative public procurement in social and healthcare*. LUT Scientific and Expertise Publications, 25.
- Škugor, E., 2017. EU procurement reform–The case of Croatia. *Public Procurement Law Review*, 2017, 2, 115–133.
- Smirnova, O., Yusuf, J.–E., Leland, S., 2016. Managing for performance: Measurement and monitoring of contracts in the transit industry. *Journal of Public Procurement*, 16, 2, 208–242.
- Smith, C., Terman, J., 2016. Overcoming the barriers to green procurement in the county: Interest groups and administrative professionalism. *Journal of Public Procurement*, 16, 3, 259–285.
- Smith, M., 2015. *Research Methods in Accounting*, third ed., SAGE Publications, London.
- Spina, G., Caniato, F., Luzzini, D., Ronchi, S., 2013. Past, present and future trends of purchasing and supply management: An extensive literature review. *Industrial Marketing Management*, 42, 1202–1212.

- Stake, J., 2014. "SME Participation and Success in Public Procurement." Paper presented at the 6th International Public Procurement Conference, Dublin, Ireland.
- Steenhuis, S., Groeneweg, N., Koolman, X., Portrait, F., 2017. Good, better, best? A comprehensive comparison of healthcare providers' performance: An application to physiotherapy practices in primary care. *Health Policy*, 121, 12, 1225–1232.
- Stenbacka, C. 2001. Qualitative research requires quality concepts of its own. *Management Decision*, 39, 7, 551-555
- Suhonen, N., Tammi, T., Saastamoinen, J., Pesu, J. Turtiainen, M., Okkonen, L., 2019. Incentives and risk-sharing in public procurement of innovations: Towards contracting strategy framework. *Journal of Public Procurement* 19, 2, 129–145.
- Tammi, T., Saastamoinen, J., Reijonen, H., 2014. Market orientation and SMEs' activity in public sector procurement participation. *Journal of Public Procurement*, 14 3: 304–327.
- Tarantini, M., Loprieno, A.D., Porta, P.L., 2011. A life cycle approach to Green Public Procurement of building materials and elements: A case study on windows. *Energy*, 36, 2473–2482.
- Tate, W.L., Ellram, L.M., Dooley, K.J., 2012. Environmental purchasing and supplier management EPSM: Theory and practice. *Journal of Purchasing & Supply Management*, 18, 173–188.
- TEM (2014). Pk-yritysten osallistuminen, näkemykset ja kokemukset julkissa hankinnoissa (Ministry of Employment and Economy: SME access, perceptions and experiences in public procurement). [Online]. Available at https://www.tem.fi/files/42772/TEMjul_54_2014_web_15012015.pdf [Retrieved March 31, 2016].
- Testa, F., Grappio, P., Gusmerotti, N.M., Iraldo, F., Frey, M., 2016. Examining green public procurement using content analysis: Existing difficulties for procurers and useful recommendations. *Environment, Development and Sustainability*, 18:197–219.
- Thai, K.V., 2007. Introduction to Public Procurement, National Institute of Governmental Purchasing, Herndon, VA, United States.
- Thai, K.V., Salia, P.J., Mwakibinga, F.A. (eds) 2019. *Advancing Public Procurement, Theories and Practices*, PrAcademics Press, Highland Beach, FL, US
- Trepte, P., 2016. All change at the World Bank? The new procurement framework. *Public Procurement Law Review*, 2016, 4, 121–150.
- Treumer, S., 2014. Contract changes and the duty to retender under the new EU public procurement directive. *Public Procurement Law Review*, 2014, 3, 148–155.
- Trybus, M., 2013. The hidden remedies directive: Review and remedies under the EU Defence and Security Procurement Directive. *Public Procurement Law Review*, 2013, 4, 135–155.
- Tsai, W.-T., 2015. "Green public procurement and green-mark products strategies for mitigating greenhouse gas emissions—experience from Taiwan," *Mitigation and*

- Adaptation Strategies for Global Change, Springer Science+Business Media, Dordrecht 2015.
- UNDP 2010. Public Procurement Capacity Development Guide. New York. United Nations Development Programme.
- Uyarra, E., Flanagan, K., Magro, E., Zabala-Iturriagoitia, J.M., 2017. Anchoring the innovation impacts of public procurement to place: The role of conversations. *Environment and Planning C: Politics and Space*, 35, 5, 828–848.
- Valovirta, V., Alhola, K., Leväsluoto, J., Nissinen, A., Oksanen, J., Pelkonen, A., Turtonen, A., 2017. Public procurement of innovation—definition, opportunities and measurement, Helsinki, Prime Minister’s Office in Finnish.
- van Weele, A., 2005. *Purchasing & Supply Chain Management, Analysis, Strategy, Planning and Practice*. London. Thomson Learning.
- Voss, C., Johnson, M., Godsell, J., 2016. Case research, in Karlsson ed: *Research methods for operations management*, second ed., Routledge, 165–197.
- Wang, P., 2017. Brexit and the WTO agreement on government procurement “GPA.” *Public Procurement Law Review*, 2017, 1, 34–61.
- Wang, H., Xiong, W., Wu, G., Zhu, D., 2018. Public–private partnership in public administration discipline: A literature review. *Public Management Review*, 20, 2, 293–316.
- Wang, S., Bunn, M.D. 2004. Government/Business Relationships: Insights Into Contract Implementation. *Journal of Public Procurement* 4, 1, 84–115
- Waterman, J., McCue, C., 2012. Lean Thinking within public sector purchasing department: The case of the U.K public service. *Journal of Public Procurement*, 12, 4, 505–527.
- Widmark, N., 2015. Public sector innovation and innovation procurement. <http://www.transform-europe.eu/wp-content/uploads/2015/09/VINNOVA-Swedish-Innovation-Agency.pdf>.
- Wiggen, J., 2014. Directive 2014/24/EU: The new provision on co-operation in the public sector. *Public Procurement Law Review*, 2014, 3, 83–93.
- Williams, A., 2014., Local preferencing for local suppliers: Examining the use of locality in public procurement. *Public Money & Management*, 34 3: 165–172.
- Wondimu, P.A., Hosseini, A., Lohne, J., Laedre, O., 2018. Early contractor involvement approaches in public project procurement. *Journal of Public Procurement*, 18, 4, 355–378.
- World Bank Group, 2016. *Benchmarking Public Procurement 2017*. Available at <http://bpp.worldbank.org/> [retrieved December 2016].
- Wynstra, F., 2010. What did we do, who did it and did it matter? A review of fifteen volumes of the (European) *Journal of Purchasing and Supply Management*. *Journal of Purchasing and Supply Management*, 16 (4): 279–292.
- Yeow, J., Edler, J., 2012. Innovation procurement as projects. *Journal of Public Procurement*, 12, 4, 472–504.
- Yin, R. K. 1994. *Case study research: Design and methods*, 2nd edition Thousand Oaks, CA: Sage.

- Yin, R.K., 2013. Validity and generalization in future case study evaluations. *Evaluation* 19, 3, 321–332
- Yin, R.K., 2017. *Case Study Research and Applications: Design and Methods*, sixth ed., Sage Publications.
- Yukins, C.R., 2017. Brexit and procurement: A US perspective on the way ahead. *Public Procurement Law Review*, 2017, 1, 71–75.
- Zheng, J., Knight, L., Harland, C., Humby, S., James, K., 2007. An analysis of research into the future of purchasing and supply management. *Journal of Purchasing and Supply Management*, 13(1): 69–83.
- Zorzini, M., Hendry, L.C., Huq, F.A., Stevenson, M., 2013. Socially responsible sourcing: Reviewing the literature and its use of theory. *International Journal of Operations & Production Management*, 35, 1, 60–109.

Datasets:

OSF 1: Official Statistics of Finland (OSF): Structural business and financial statement statistics [e-publication].
ISSN=2342–6233. Helsinki: Statistics Finland [referred: 2.1.2020].

OSF 2: Official Statistics of Finland (OSF): Local government finances [e-publication].
ISSN=2343–4163. Helsinki: Statistics Finland [referred: 2.1.2020].
Access method: http://www.stat.fi/til/kta/index_en.htm

Publication I

Kivistö, T. & Virolainen, V.M.

Public procurement spend analysis at a national level in Finland

Reprinted with permission from
Journal of Public Procurement
Vol. 19 No. 2, pp. 108-128, 2019
© 2019, Emerald Publishing

PUBLIC PROCUREMENT SPEND ANALYSIS AT A NATIONAL LEVEL IN FINLAND

Timo Kivistö, Veli Matti Virolainen*

ABSTRACT International organizations, public organizations' national control entities, and managers are interested in monetary spend. Public procurement literature and the system of national accounts lack proper definitions of public procurement in accounting terms or are framed by legal procedures. The authors draft clear monetary definitions for procurement boundaries and develop an alternative, more refined bottom-up method of calculating public procurement spend. The calculation for Finland is based on reliable secondary data and shows considerably higher procurement spend than traditional SNA statistics or procurement notices. The calculation can be replicated in other countries using the 2008 SNA coding for organizations. The paper highlights the need to address in-house procurement in future research.

INTRODUCTION

Knowledge of the amount of public procurement (PP) is important for several stakeholders. For example, international organizations (e.g. United Nations [UN], International Monetary Fund [IMF], World Bank [WB]) are concerned about efficient use of public money as part of developing countries' funds are subsidies from other countries.

**Timo Kivistö, MSc (Eng), is a consultant specializing in public procurement. He is also a doctoral student at Lappeenranta University of Technology, School of Business and Management. His research interest is public procurement. Veli Matti Virolainen, Dr.Sc. (Tech), is a professor of supply management at Lappeenranta University of Technology, School of Business and Management. His research interests are supply strategy, value networks, and public procurement.*

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

Theoretically, the monetary value of PP, that is, PP size or spend, is either loosely defined or not defined at all (Prier & McCue, 2009). Instead, researchers rely on figures provided by international organizations (Patrucco et al., 2016) or national statistics on governments in general or certain governmental departments (Pegnato, 2003; Cogburn, 2003). In a review of the literature on public procurement (Patrucco et al., 2017), the topic was not even mentioned. Usually, PP estimates are in the introduction part of the articles. Therefore, a spend analysis of all public entities on a national level is required.

PP is relevant to several international organizations that provide national-level guidance or information. For instance, the UN's legal body, UNICITRAL, developed a Model Law for Public Procurement (UNICITRAL, 2011) and the World Bank examines processes, performs evaluations, and creates benchmarks related to PP (World Bank, 2017). Financial information is collected in individual countries by statistical bureaus, central banks, and ministries of finance. The System of National Accounts (European Commission et al 2009) is a set of guidelines for collecting information supported by the UN, IMF, Organisation for Economic Co-operation and Development (OECD), EU, and World Bank. The IMF's Government Financial Statistics (GFS) (International Monetary Fund 2014) is a slightly different framework with a similar purpose. The OECD also provides financial statistics concerning PP, and the European Commission uses SNA-based reporting as a PP indicator. Collectively, these data represent the total monetary volume in each country according to the definitions in each organization's respective manual.

Other types of data collection involve a legal framework. The European Commission cooperates with the OECD to produce the OECD SIGMA series of reports. However, the OECD (2010) recognized monetary value beyond the EU's legal regulations. Further, the World Trade Organization (WTO) collects statistics concerning procurement under the Agreement on Government Procurement (GPA) (World Trade Organization, 2013), and the United States General Accounting Office used WTO statistics when determining the importance of the GPA for the US economy (United States Government Accountability Office, 2015). Nonetheless, the World Bank Group (2016, p 5) finds that "reliable statistics on the size of PP in economies around the world are still not available."

This article provides clear definitions of PP to help identify monetary flow that can and cannot be considered procurement. In particular, it considers European legislation regarding PP, lists the organizations that must follow PP laws, and identifies monetary flows that are beyond legal PP frames but are still regarded as PP. It then

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

presents a calculation model based on SNA definitions and supported by other secondary data sources to provide a valid measure of PP size, especially for managerial purposes. Theoretically, the article provides clear definitions of PP and reveals a neglected area in PP research: the use of in-house or government-to-government suppliers.

The paper is organized as follows. The literature review discusses national spend as a topic in PP literature. The methodology section explains the data sources and calculation methods. The definition section determines the boundaries of PP. The calculation section presents both the calculation procedure and results from multiple angles. The discussion section analyzes the results, and the conclusion section discusses the implications of this study and highlights possible future research.

LITERATURE REVIEW

The theoretical foundation of the research is supply chain management (SCM) theory. Spend analysis, which is a tool or process in strategic sourcing, is also applied. Harland et al. (1999) present four levels of supply chain: level one is supply within the firm boundaries, level two is supply in a dyadic relationship, level three is supply in an inter-organizational chain and level four is supply in inter-organizational network. These all levels are present in public procurement. This article is looking at supply chains at level 2: supply in a dyadic relationship.

There have been few systematic literature reviews related to PP. However, at least two comprehensive literature reviews were published recently in the *Journal of Public Procurement*. The first is by Flynn and Davis (2014) and it focuses on PP theory, and the second is by Patrucco et al. (2017) and it focuses on research perspectives.

Flynn and Davis (2014) call for scientific rigor in PP research. In the paper, they reveal that 29% of articles are grounded on one of four types of theoretical framework: an economic, sociology, management, or psychology theory. They also refer to Prier and McCue (2009), who hold that “public procurement is said to suffer from definitional ambiguity and porous field boundaries, making the application of theory problematic in comparison to mature fields that operate within strict parameters.”

Patrucco et al. (2017) recognize that there are different types of institutions: governmental, local/municipal and not specifically governmental. However, this classification omits corporations owned

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

by public entities. Further on, Patrucco et al. (2017) overviews the research topics. After analysis through the lens of this paper, two papers on spend analysis and 37 papers on procurement regulation, in which national spend might be mentioned, were identified.

Spend analysis is rarely discussed in academic papers. Knight et al.'s (2017) is one of the few, describing spend analysis as a first step in strategic sourcing. Their analysis involves one procurement category of part of a public entity. Limberakis (2012) used a tool perspective to obtain a 360-degree view of company spend data. Hawkings et al. (2014) uses spend analysis as a purchase category in a public entity. The United States Accountability Office (2005) provides guidelines for performing a spend analysis in a public entity. These pioneering sources demonstrate that spend analysis is usually performed at an entity level or is broken down to a procurement category level, and it usually aims to determine categories for the strategic sourcing process. Notably, research at the national level is missing.

OECD (2015) statistics show that PP by governments ranges from 5% (Mexico) to 22% of their gross domestic product (GDP) (Netherlands). This percentage is affected by the share of procurement in public expenditure (e.g., 21% in Mexico and 45% in the Netherlands). The average percentage of PP is 13% of the GDP in OECD countries. However, Léon de Mariz et al. (2014) found the share to range between 5% (Mauritius) and 35% of the GDP in sub-Saharan African countries, with an average of about 15%. Further, the share of procurement in public expenses ranged from 25.5% (Mauritius) to 75% (Liberia), with an average of more than 50%.

OECD figures describe the percentage of PP of GNP by the general government. Additionally, the International Monetary Fund (2014) recognizes public corporations as belonging to the public sector (see Figure 1). Penttilä et al.'s (2015) legal analysis of municipally owned corporations showed a 74% increase from 2007 to 2013, the majority of which are different types of real estate corporations. In total, 20% represent utilities (water and electricity), according to EU legislation (Penttilä et al., 2015).

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

S13	S11	S12	S14	S15
General Government Sector	Nonfinancial Corporations Sector	Financial Corporations Sector	Households Sector	Nonprofit Institutions Serving House-holds Sector
Central government	Public corporations	Public corporations		
State government				
Local governments	Private corporations	Private corporations	Private	Private
Public sector				

Figure 1. Public sector's relationship to other institutional sectors of the economy (International Monetary Fund, 2014).

Research generally estimates PP to comprise 10–20% of the gross national product, calculated using the SNA (Thai & Grimm, 2000; Nicol, 2003). However, only a few studies have attempted to calculate the amount of PP. Audet (2002) explains the two types of PP estimation: SNA-based estimates and the bottom-up method (e.g., surveys based on procurement notices conducted by the WTO and Official Journal of the European Commission). SNA-based methods are widely used because they allow country-wise comparisons. Nonetheless, Audet (2002) cautions against the use of these estimates as they often omit corporations owned by public entities. Bergman (2008) attempts to calculate the monetary value of PP using four different methods: first by examining various sectors of national accounts, secondly by examining OJEC notices, thirdly by conducting branch-wise calculations, and fourthly by conducting a survey. He recognizes differences in public expenditure and procurement under EU directives, and he calculates the amount procured by corporations owned by public entities. Cernat et al. (2015) uses data derived from the SNA for calculating PP value, as does Konkurrensverket (2015), who focuses on the legal framework of procurement. However, they do not include exceptions from directives, procurement between public entities, and payments that are transferred into PP. de la Iglesia (2014) suggests an estimation method based on procurement notices, but it is legally framed and subject to omission and misclassification.

An unclear definition of PP is offered in the procurement strategy of the central government (Ministry of Finance 2009), as described in Figure 2.

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

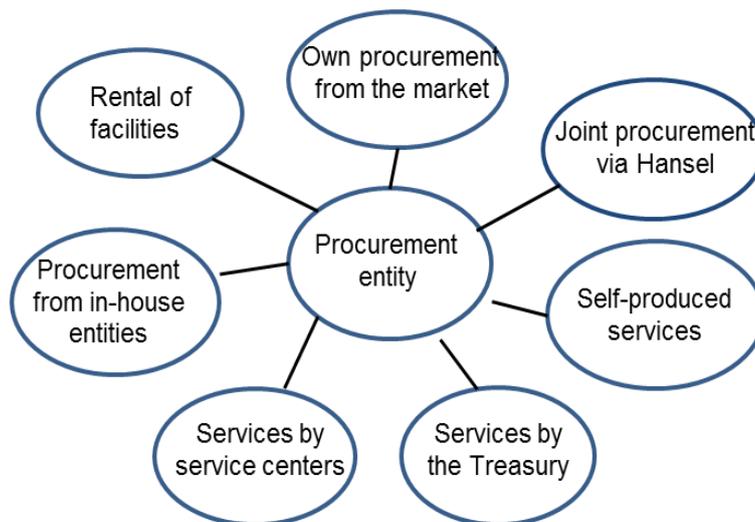


Figure 2. Procurement channels for entities in the Finnish central government (Hansel is the Finnish central government procurement unit)

Figure 2 shows a mixture of services offered by the central government and procurements from external sources. Calculation of internal invoicing should be separate from calculation of procurement by external suppliers.

Another approach for defining PP boundaries is based on records of public expenses, as observed in the Finnish central government's annual report (see Figure 3).

The costs of the central government are 20% of its total expenses. The majority of expenses are transfer payments, terms subsidies, and grants, some of which could be considered procurement, especially performance-based grants. For example, Prier and McCue (2009) suggest including grants for public purposes and cooperative agreements could be part of PP. An issue specific to Finland is monetary compensation for rehabilitation used and paid by the citizens and further compensated by the Social Security Fund.

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

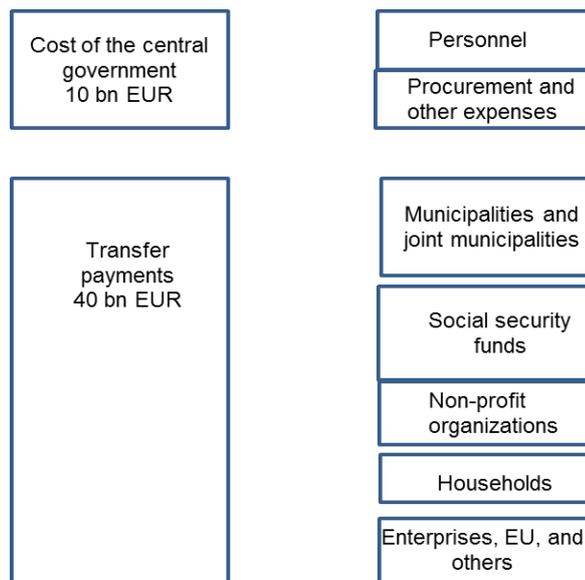


Figure 3. The composition of the Finnish central government's annual report.

The literature on PP is dominated by international organizations (UN, IMF, World Bank, OECD, European Commission) that collaborate with each other to define a common way of collecting data and using public procurement. The current data collection framework is the SNA (European Commission et al 2009). As it is a common mission for all countries, the SNA gradually improves, but it remains restricted, either as a whole or in national implementations. There is not one scientific journal that focuses on the size of public procurement (Patrucco et al., 2017). However, there are a small number of articles in which this issue is mentioned in the introduction with some evidence from individual countries (Pegnato, 2003; Cogburn, 2003; Thai & Grimm, 2000; Schapper et al., 2006). The size of PP is discussed in depth by Audet (2002) and Bergman (2008). The papers can discuss the size PP purely by monetary value or combined with the legal framework. For example, Audet (2002) discusses whether the public procurement is tradable, Konkurrentverket (2015) asks whether entities have to apply the public procurement directive, and the OECD (2010) addresses threshold values.

The gap in the literature is due to the fact that “reliable statistics on the size of PP in economies around the world are still not available”

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

(World Bank, 2016, p.5). In addition, Prier and McCue (2009) note that “public procurement is said to suffer from definitional ambiguity and porous field boundaries, making the application of theory problematic in comparison to mature fields that operate within strict parameters”. The porous boundaries of the field are seen also in the procurement strategy of the Finnish Central Government (Ministry of Finance, 2009).

RESEARCH METHODOLOGY

Data Sources

This research used quantitative secondary data, including financial statistics, annual reports, and procurement notices. According to Ellram and Tate (2016), financial data is reliable since it is usually audited. Procurement notices are poorer sources of data as data are often missing and monetary value is indicated for the whole contract period rather than the annual volume. In this article procurement notices are used for organizations making public procurement randomly.

Data were collected from financial statistics published in audited annual reports by single municipalities or several municipalities. Subsidies that involved service vouchers may have led to inaccuracies. Other classification inaccuracies were not likely to occur because aggregate data was used. Other statistics provided by association may not have been as reliable as national statistics; however, their share was less significant than that of statistics published by municipalities.

Secondary sources were audited annual reports of the Finnish central government and publicly owned organizations. For some organizations, total expenses were used to estimate the share of procurement by similar types of organizations.

The major concern regarding reliability is the estimation of municipally owned corporations. Figures were extrapolated from municipal statistics by calculating the ratio of consolidated expenses to focal municipality expenses as well as investments (or capital formation). This implies that the shares of procurement in companies and the municipality itself are identical. The calculation also omits procurement between municipally owned organizations, which can be as high as 30% of the volume of procurement. Thus, secondary calculations were performed using corporate statistics published by publicly owned corporations.

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

As procurement notices do not necessitate calculation of monetary volume and represent the value of the contract period rather than the fiscal year, they are less reliable sources of data. However, the share of notices in the total volume of data is insignificant.

Research approach

This research used a mixed methods approach. An alternative and more refined method of calculating public procurement spend that was typical of qualitative research was developed, and data were quantitatively analyzed to ensure accuracy, as in the natural sciences. The theoretical grounding of the study involves SCM theories and spend analysis conducted at a national level.

Validity and reliability

This study focused on developing a valid tool to measure the size of PP. In order to achieve validity, lower-level statistics were used rather than aggregate SNA data. As demonstrated in this article, the definition of PP and scope of institutions covered by PP regulations differ for SNA and actual regulations. Internal validity was not considered because the study attempted to create rather than test a calculation method. External validity was assessed and determined to be sufficient because the calculation method used SNA definitions complemented by other secondary data. Therefore, the method can be replicated in any country using existing data sources. Ecological validity, particularly for identifying different categories of PP, was good as public entities have to govern every category of PP. Further, reliability is enhanced because the calculation process allows replication.

DEFINITIONS OF KEY TERMS

Independent Organizations

Coase (1937, p. 19) differentiated between market and internal production: "Outside the firm, price movements direct production, which is co-ordinated through a series of exchange transactions on the market. Within a firm, these market transactions are eliminated and in place of the complicated market structure with exchange transactions is substituted the entrepreneur-co-ordinator, who directs production." Thus, the definition of procurement implies transactions from the

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

market; production within the firm is not procurement. In Harland et al (1999) framework, this paper looks at supply in dyadic relationships. The SNA (2008, p. 61) states that “an institutional unit is an economic entity that is capable, in its own right, of owning assets, incurring liabilities and engaging in economic activities and in transactions with other entities.” Further, it is possible to form a complete set of accounts for the unit. Unincorporated units are classified as quasi-corporations, but this classification does not matter when considering national accounts. When expense flow involves external (rather than internal) invoicing within the government, it is considered procurement. In this study, invoicing by unincorporated units was regarded as internal invoicing as data sources were unable to recognize unincorporated units.

As shown in Figure 4, only self-procurement, procurement from in-house entities, and joint procurement using Hansel’s framework were considered to be procurement. Rental of facilities and services by service centers and the treasury were considered other entities within the central government. Self-produced services belonged to neither group.

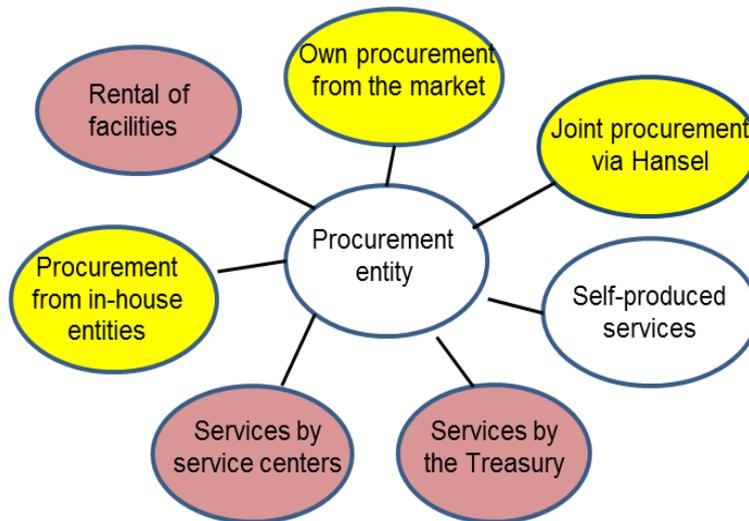


Figure 4. Sourcing channels: procurement (yellow), internal invoicing (red), and self-production (blank).

Accurately Identifying Procurement

Williamson (1985) uses transactions to define procurement, considering transactions outside the firm to be procurement transactions. van Weele (2010) classifies procurement according to a

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

variety of materials (including capital expenditure) and services. Axelsson and Wynstra (2002) examine purchasing of services, of which financial services are a major group. While Prier and McCue (2009) and Murray (2009) adopt a process-oriented view of PP, they also use a variety of PP definitions, recognizing goods, services, and construction as categories of procurement. Murray (2009) also includes third-party acquisition and in-house providers because they involve make-or-buy decisions. Prier and McCue (2009) refer to the American Bar Association's (ABA's) Model Code for Public Procurement, which defines PP as "buying, purchasing, renting, leasing or otherwise acquiring any supplies, services or construction" (American Bar Association, 2000, p. 7). In addition, 'The ABA Code shall not apply to...contract between the state and its political subdivisions or other governments' (ABA, 2000, p. 2). Watermeyer (2004, p. 3) defines PP as "a process which creates, manages, and fulfils contracts to the provision of supplies, services or engineering and construction works, the hiring of anything, disposals acquisition or granting of any rights and concession." According to this definition, financial services are considered procurement, often as a part of construction or services, as are principal loan amounts. However, there are two ways of organizing financing: the central government issues bonds for the international financial market, which therefore cannot be regarded as procurement, or municipal governments rely on banks and other financial institutions for loans, which should be regarded as procurement.

The second aspect of identifying procurement is whether payments and invoices are procurement or transfer payments. This is specifically related to governmental monetary flows. While this classification is straightforward for goods, services, and work, both central and local governments have separate accounts for subsidies and grants, which are transfer payments.

The SNA (European Commission et al 2009) defines government financial operations as follows:

The first group consists of actual or imputed expenditures on the free provision to the community of collective services such as public administration, defence, law enforcement, public health, etc. that are organized collectively by government and financed out of general taxation or other income.

The second group consists of expenditures on the provision of goods or services free, or at prices that are not economically significant, to individual households. These expenditures are deliberately incurred and

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

financed out of taxation or other income by government in the pursuit of its social or political objectives, even though individuals could be charged according to their usage.

The third group consists of transfers paid to other institutional units, mostly households, in order to redistribute income or wealth. (p. 78).

In Finland, central government operations cost 10 billion EUR, but transfer payments total 40 billion EUR (Figure 3). Municipalities have a separate category for subsidies under 6% of the total expenses. Transfer payments from the central government are assigned to households (e.g., unemployment benefits, compensation for pharmaceuticals and healthcare services), corporations (e.g., R&D, compensation for farming), and municipalities (e.g., state subsidies for education, social welfare, and healthcare). Moreover, municipalities provide subsidies to households and third-sector organizations (e.g., associations).

Organizations Engaging in PP

Further task is to define 'public' organizations engaging in PP. The definitions of the public sector used by SNA and GFS are identical (International Monetary Fund, 2014). The first group is general government, which can be further divided into central, state, and local government and social security (sector code S13). The second group includes public non-financial corporations (part of S11) and public financial corporations (parts of S12). Non-profit organizations serving households (S15) are not regarded as public organizations.

The EU's PP legislation defines the public sector differently. Directive 2014/24, Section I, Article 2, Paragraph 1 (European Commission 2014a) provides the following definition: "contracting authorities' means the State, regional or local authorities, bodies governed by public law, associations formed by one or several of such authorities or one or several of such bodies governed by public law". A 'body governed by public law' refers to any body that is (a) established for the specific purpose of meeting the needs of the general population without industrial or commercial interests; (b) in possession of a legal personality; and (c) financed, for the most part, by the state, regional or local authorities or by other bodies governed by public law, subject to management supervision by those bodies, or having an administrative, managerial or supervisory board of which more than half of the members are appointed by the state, regional or local authorities. For the latter, two categories can be distinguished:

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

bodies that constantly or occasionally have to comply with PP legislation.

Directive 2014/25 (European Commission 2014b) on procurement by entities operating in the water, energy, transport, and postal services sectors (Title I, Chapter I, Article 3–14) (usually termed “utilities” or “sector directive”) defines, which organizations are contracting authorities. These entities can be privately owned. Directive 2009/81/EU (European Commission 2009) is concerned with procurement for military and safety purposes, and the contracting authorities are the same as for Directive 2014/24.

Importantly, in Finland, the categorical difference between SNA and directives is that national churches collect taxes, while the aforementioned bodies are governed by public law.

Identifying Procurement Accounts

The National Accounts Statistics rely on European System of Accounts (ESA) 1995 (European Commission 1996) data and revised data from the ESA 2010 (European Commission 2013). The changes from the ESA 1995 to ESA 2010 do not affect the definition of PP. The IMF Government Financial Statistics Manual (International Monetary Fund 2014) is consistent with the account definitions in the SNA, although the figures may differ because of variances in calculation.

PP indicators (2011, p. 1) are defined as “the figures are derived from ESA 95 data for National Accounts for general government and utilities. They are the sum of the aggregates P2 (intermediate consumption), P51 (Gross fixed capital formation) and D6311_63121_D63131PAY (social transfers in kind related to expenditure on products supplied to households via market producers, payable).”

The first type of PP accounts is intermediate consumption, meaning procurement of goods and services. Table 1 shows the differences between definitions of PP. According to the revised ESA 2010 data, intermediate consumption (listed as 3.89) “consists of goods and services consumed as inputs by a process of production, excluding fixed assets whose consumption is recorded as consumption of fixed capital. The goods and services are either transformed or used up by the production process.” The GFS definition is conceptually identical but differs in practice due to differences in the treatment of specific transactions (International Monetary Fund, 2014).

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

Table 1. *Intermediate Consumption According to Definitions of Procurement*

	PP indica- procure- tors ment		
P2 Intermediate consumption (ESA)			
3.89. (b) goods and services of the same institutional unit	yes	no	internal invoicing
3.89 (_e) subscriptions to non-profit business associations	yes	no	subsidies
3.89 (j) FISIM purchased by resident producers (financial intermediation services indirectly measured)	yes	no	
3.89 (k) non-market output of the central bank	yes	no	

The second type of PP accounts is gross fixed capital formation, meaning different kind of investments. The ESA (2013) defines gross fixed capital formation (3.124) as consisting of “resident producers’ acquisitions, less disposals, of fixed assets during a given period plus certain additions to the value of non-produced assets realised by the productive activity of producer or institutional units. Fixed assets are produced assets used in production for more than one year” (p. 51). Again, the GFS definition is conceptually the same but differs in practice due to differences in the treatment of specific transactions (IMF, 2014). In terms of procurement, GFS is more accurate when own-account capital formation is excluded. The use of intermediate consumption in capital formation is calculated in (P2), see table 1.

Table 2 shows the differences between definitions.

Table 2. *Gross Fixed Capital Formation Versus Procurement Definitions*

	PP indica- procure- tors ment		
P51g Gross fixed capital formation			
3.127. (7) R&D	yes	yes	only procured
3.127. (8) Mineral exploration and evaluation	yes	yes	only procured
3.127. (9) Computer software and databases	yes	yes	only procured
3.127. (10) Entertainment, literary and artistic originals	yes	yes	only procured
D121 Employers social contributions	no	yes	only for enterprises

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

The third type of PP accounts are social transfers for expenditure on products supplied to households via market producers that are payable either by non-market producers (D631) or by market producers (D632). In Finnish society, these refer to customer services provided by non-market- or market producers and price compensations provided by the Finnish Social Security Fund. The price compensations are not defined as procurement.

Interest (D.41) is defined by the ESA (European Commission 2013, p 98) as “property income receivable by the owners of a financial asset for putting it at the disposal of another institutional unit.” Table 3 shows the financial assets to which interest applies.

Table 3. *Other ESA 2010 Classifications Versus Procurement Definitions*

	PP indica- procure		
	tors	ment	
D41 Interest from loans	no	yes	
D45 Rent on land and subsoil resources	no	yes	
D631-2 Social transfers in kind	yes	yes	customer services from others, price compensation not

PP indicators defined this way correspond to a figure of 37,113 million EUR in FY2013.

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

CALCULATION

Calculation Process

The calculation process is described in Figure 5. It recognizes different levels of public organizations as well as other bodies obliged to follow PP rules constantly or occasionally.

Central general government	Annual report	Choose accounts
		Remove internal invoicing
Sub-central general government	Statistics	Choose accounts
		Remove internal invoicing
Corporations owned by central government	Statistics	Choose accounts
	Annual reports	
Corporations owned by sub-central government	Statistics	Choose accounts
	Sample of annual reports	Add possible horizontal invoicing
Other organizations obliged to follow public procurement rules	Branch-wise statistics	Choose accounts
	Sample of annual reports	Choose accounts
Occasional public procurement	Procurement notices	

Figure 5. Process of calculating the size of public procurement.

The Bottom-up Approach of Analyzing Financial Statistics and Annual Reports

Data sources for central government procurement include the central government's annual report, separate calculations of finances that are not included in the annual report, and the annual reports of state-owned corporations that conduct procurement under procurement directives. For the state government, there is (1) a profit-

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

and-loss account for on-budget entities and three separate categories of finances: (2) unincorporated state enterprises, (3) extra-budgetary funds, and (4) entities governed by the Parliament of Finland, including the Social Security Fund and the Bank of Finland. The volume of procurement is analyzed using annual reports from (1), (2), and (4) as well as budget figures for operating expenses, with an estimated procurement percentage for (3).

Universities (5) are distinct from on-budget entities. Thus, procurement volume was analyzed based on university statistics, and one university's annual report served as a sample for estimating the percentage of procurement volume compared to total expenses. Independent central government corporations (6) are controlled by the ownership steering unit of the Prime Minister's Office. Such companies are divided into those (1a) with an investor interest only, (1b) with a strategic interest, (2) and with a special mission and strategic interest. We chose 20 companies from groups 1b and 2 that must follow PP regulations. Their volume of procurement volume was analyzed based on annual reports. Additionally, they were classified according to ESA 2010 S13 as government units, utility companies, and others. Data from municipalities (7) and joint municipal boards (8) were obtained from Statistics Finland. While they include unincorporated corporations, which may be involved in water, electricity and transport activities related to utilities, these statistics do not contain data regarding municipally owned corporations.

In order to design the research method, an exploratory case study of the city of Lappeenranta was undertaken to identify the different types of municipal corporations, including fixed capital-intensive activities such as citizen dwellings, premises for companies, and utilities such as energy works and ports. Some companies were owned by several entities that offered services for their owners, such as occupational healthcare, catering, cleaning, IT support, and financial services. The municipalities comprised percentages of the joint municipalities to which they belonged. Foundations as a legal institutional form, included housing for older adults and recreational area ownership, but they were not incorporated into consolidated financial accounts. To calculate the ratio of procurement, we decided to use separate ratios for profit-and-loss accounts and fixed capital formation. Consolidated financial accounts did not provide detailed information regarding costs.

To analyze the volume of procurement for corporations owned by municipalities (9), we used a sample of 26 municipalities representing 45% of the total population. The sample contained 8 of the 9 largest municipalities, every other municipality from the next 12 largest

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

municipalities, and 12 differently sized municipalities. The smallest municipalities, which represented 10% of the population, were excluded from the sample. Financial data by municipality was obtained from Statistics Finland. After calculating the sum of consolidated financial accounts from the sample municipalities, we calculated separate ratios for profit-and-loss accounts and for fixed capital formation, with ratios of 1.32 and 2.03, respectively. These figures were consistent with external procurement by municipalities. In-house procurement between subsidiaries was not included.

Corporations owned by joint municipalities (10) were analyzed using a sample of four types of joint municipalities and a sample of ten different entities. The corporations were concerned with ownership of premises, and the consolidated financial accounts showed a marginal increase in the procurement value as well as a substantial increase (5%) in fixed capital formation.

The Evangelical Lutheran Church's (11) self-assessed economic statistics were obtained, as they collect taxes and thus must follow the procurement law in Finland. However, there was no information for the Orthodox Church, which represented 1.1% of the population.

Data concerning these traditional procurement entities had to be supplemented with procurement data from bodies governed by public law. Centralized statistics were obtained for unemployment funds (12) and pension funds servicing public entities (13). Other bodies that were recognized as public procurers (14) were analyzed using the notices database. They represented privately owned service housing, farmers, private roads, water cooperatives, and telecom cooperatives or corporations.

Table 4. *Other Bodies Governed by Law*

Other bodies governed by law	M€	Expen- ses	Mate- rials	Servi- ces	Rental	Other	Inte- rest	Invest- ments
Finlands Slot Machine Association			11,4	0,3		175,6		42,4
The Finnish Innovation Fund Sitra				21,3				
Pension funds (KEVA, MELA)				264,8				2,2
Unemployment funds		80,2		40,1				
EU in Finland		93,2		37,28				

The included utilities (15) were (a) electricity distribution companies, (b) gas distribution companies, and (c) water distribution and transport facilities. Several procuring utilities were owned by the central government or a municipality. The primary organizations providing transport facilities were:(d) State Railways, (e) Finavia, and

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

(f) municipal ports. Data was obtained from the Energy Authority (for a and b), Statistics Finland (for c), annual reports (for d and e), and the Port Association (for f). Another recognized utility was Posten Åland. However, the post on the mainland is outside the utilities directive.

Calculation Using Statistics and Annual Reports

The monetary value of PP entities in Finland and the sources from which these values have been derived are listed in Table 5. Monetary value can be investigated in relation to procurement legislation. However, some monetary value is outside the procurement directive (i.e., rental of premises and interest on loans) (OECD, 2010). In addition, procurement from in-house entities and G2G transactions are also outside the legislation. For example, municipalities procure health care services from joint municipalities, on-budget central government entities rent their premises from Senate Properties, and joint municipalities procure laundry services from their in-house corporations. Further, procurement that falls below threshold values must be considered (OECD, 2010).

Many countries within the EU either have national threshold values or determine the highest values for direct purchases. To estimate this rate in Finland, invoice data from one medium-sized municipality was used. Thus, the estimate was based on the annual volume of procurement from suppliers. If the procurement volume was lower than the Finnish national threshold value of 30,000 EUR, it was classified as falling below the threshold. In the case study of an organization, 7% of the procurement volume fell below the threshold. Unsurprisingly, this estimate is small as it is legal for different departments to use the same supplier. For construction projects, the threshold value is calculated based on the project value, which is typically divided by the number of specialized suppliers. In the case study, 24% of the procurement value fell below 200,000 EUR. Procurement entities organize the competition for each construction project separately, and the same supplier can win several projects. However, this situation affects only the percentages that are above and below the threshold values and not total volume. Table 6 lists the monetary value of PP in Finland that falls within the purview of procurement law.

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

Table 5. *Monetary Value of Public Procurement in Finland 2013*

Public procurement entity	value	M€	%	NAC	
				class	Note
On-budget entities	5 698			S13	Central government annual report
Other off-budget entities	530			S13-soc	Annual reports KELA, BOF
Extra budgetary funds	98			S13	Budget proposal 2013, % estimated
Senate properties (central government enterprise)	509			S13	Annual report Senate prop
Forest Administration (central government enterprise)	268				Annual Report Forest Administration
Universities	1 006			S13	statistic of total expenses, procurement estimated
Central government corporations / S13	751			S13	
Central government corporations /others	340				
Central government corporations / Utilities	1 213				
Regional government of Åland	91			S13	Annual report
Municipalities	23 203			S13	statistics / S13 except utilit
Municipal corporations S13	1 585			S13	
Municipal corporations - others	4 327				estimate
Municipal corporations - energy + water	3 911				
Municipal corporations - traffic	84				Port statistics
Joint municipalities	6 442			S13	statistics / S13 except utilit
Joint municipalities corporations	43				Sample of annual reports
Parishes	463			S15	parish statistics (evl, ort or
Other bodies governed by law	595			S13	
Other public procurement	200				subsidies over 50% distribution statistics, overlapping eliminated, percentage of private
Electricity distribution	2 109	0,33			as above
Gas	288	0,50			Corporate statistics, E
Water	2 354	0			Posten Åland
Other utilities	30				
Total	52 227				

The monetary value of PP under the purview of procurement law is further divided into general procurement, utilities, and military and security directives. Data concerning the volume of military and security procurement were obtained from financial reports published by the Ministry of Defence and the Frontier Guard because the EU definition of military and security procurement contained only core equipment for those purposes, resulting in underestimation compared to countries outside EU.

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

Table 6. *Monetary Value of Public Procurement by Legal Environment*

Public procurement entity	General PP	Utili-ties	Military and security	Inhouse	Outside PP law	Under threshold
On-budget entities	4 196		951		0	552
Other off-budget entities	423			68	0	39
Extra budgetary funds	91				0	7
Senate properties (central government enterprise)	392				51	67
Forest Administration (central government enterprise)	245				0	23
Universities	664			240	0	102
Central government corporations / S13	616				25	110
Central government corporations /others	184				0	156
Central government corporations / Utilities		825			0	388
Regional government of Åland	80				2	9
Municipalities	11 116			9 662	201	2 224
Municipal corporations S13	1 474				0	111
Municipal corporations - others	2 961				1 000	365
Municipal corporations - energy + water		2 659		x	0	1 251
Municipal corporations - traffic		57			0	27
Joint municipalities	5 406	322		x	124	590
Joint municipalities corporations	33				0	10
Parishes	430				0	32
Other bodies governed by law	344			210	0	42
Other public procurement	93	93			0	14
Electricity distribution		473			0	223
Gas		98			Interest	46
Water		0			0	0
Other utilities		21			0	10
	28 748	4 548	951	10 180	1 403	6 397

In-house or G2G procurement was likely to increase because the Finnish municipality act necessitates the incorporation of all municipal activities that have external customers. The share of procurement from other public entities, mostly in-house entities, is large (Figure 6, adapted from Kivistö & Virolainen, 2017).

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

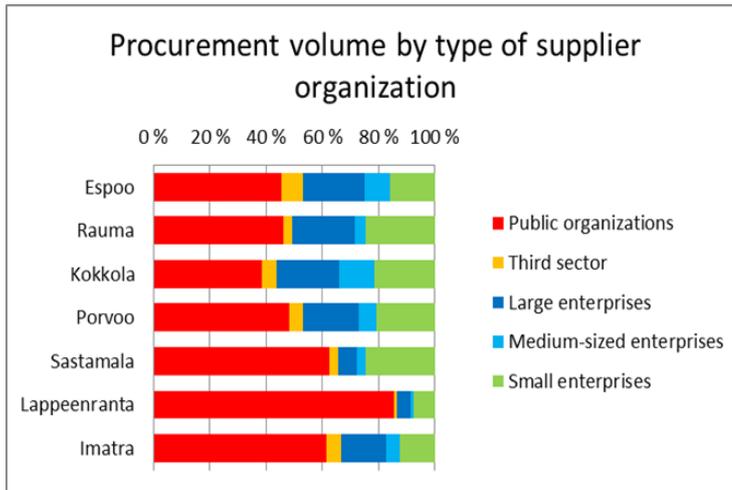


Figure 6. Volume of procurement in Finnish municipalities by type of supplier organization (adapted from Kivistö & Virolainen, 2017).

Table 7. In-House and External Procurement in the City of Lappeenranta

Organization	Subsidiaries		In-house procurement	External procurement
	(wholly owned/partly owned)	(wholly owned/partly owned)		
Lpr Housing Services Ltd	4 / 0		8 349 000	10 011 808
Lpr Energy Ltd	3 / 1		33 855 757	40 369 179
Lpr Business Ltd	11 / 0		2 637 000	17 449 804
Saimaa Support Services etc.	0 / 2		2 802 000	10 174 107
South Carelian Waste Ltd	0 / 1		769 000	10 093 757
Saimaa Univ of Applied Scienc	0 / 1		379 000	5 942 477
Partly owned organizations	0 / 5		2 128 000	4 863 229
Joint municipalities	0 / 4		2 051 000	13 334 726
Lappeenranta (consolidated without the city)			52 970 757	112 239 087

The monetary value of municipally owned corporations may be higher than estimated due to transactions between different subsidiaries. To illustrate this, the procurement volumes for the city of Lappeenranta are shown in Table 7 (adapted from Kivistö & Virolainen, 2017). In-house procurement comprises one-third of the total procurement volume of subsidiaries (excluding Lappeenranta itself), implying that it contributes 3.3 billion EUR to the national volume of procurement.

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

PP can be further divided according to materials (goods, supplies), services, rentals, others, interest, and investments, primarily in various kinds of work and equipment. The different types of PP in Finland are presented in Figure 7.

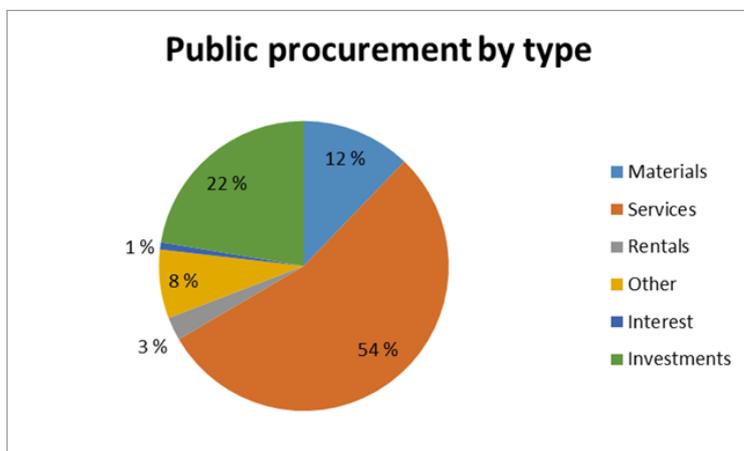


Figure 7. Public procurement in Finland by type

PP Analyzed Using the Notices Database

Procurement value derived from the national procurement notice database (HILMA) involves both EU tenders and national notices. Table 8 shows data from the HILMA database, from which only procurement notices were obtained. If we consider missing values, notices comprise 83% of general procurement and 73% of utilities, suggesting that the majority is included in notices. This may also reflect the percentages of procurement that are below threshold values. Further, the values mentioned in HILMA correspond to the value of the tender and not the annual volume.

Table 8. Procurement Value According to Notices Versus Actual Procurement

	General PP	Value data	Utili- ties	Value data	Military and security	Value data
HILMA (EU-notice)	5982	36 %	631	18 %	86	100 %
HILMA (national-notice)	6877	99 %				
HILMA (direct purchase)	497	98 %				
Total value	28 748		4 548		951	
Notices / total value	46 %		14 %		9 %	

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

DISCUSSION

PP indicators used by the European Commission are based on national accounts statistics. This article found that these indicators are significantly smaller (37.4 billion EUR) than those obtained from annual reports using the bottom-up approach (52 billion EUR). This difference can be attributed to the inclusion of publicly owned corporations in the latter method (10 billion EUR). Since the ESA 2010 did not provide different sector codes for publicly owned organizations, the indicators stayed at the present level.

The monetary value of PP identified in this study is higher than in the SNA as trade between municipalities and hospital districts (joint municipalities) is eliminated in the SNA. However, this study includes procurement by the general government from publicly owned corporations. Additional horizontal trade between publicly owned companies can be as high as 3.3 billion EUR.

This study also showed that a significant portion of the monetary value of PP was outside the purview of directives, of which the highest volume was procured in-house and by other G2G services (10 billion EUR). Konkurrensverket (2015) recognizes the same issue, mentioning that 38% of procurement comes from other public organizations. By definition, rental of premises and interest on loans were exempt from directives (1.4 billion EUR). Interest for loans is not usually mentioned in procurement definitions, but other types of leasing arrangements and hiring were included. The notices database contains optional value data for individual notices. It provides the value of the competition for the life cycle of the notice rather than the value of the annual volume. Consequently, notices databases cannot give accurate information. While data are needed to estimate the value of other forms of procurement, it is difficult to classify entities that are considered to engage in other procurement because of poor data quality. Other procurement was estimated to be 200 million EUR. Additionally, small-value procurements are not governed by directives. In most countries, an equivalent threshold—termed “national threshold value” or “maximum value for direct purchasing”—is used.

Although this paper examined PP by public organizations, private organizations, primarily those in the utilities sector, also need to observe PP laws. Private sector procurement totals 1 billion EUR. However, the calculation incorrectly omits PP paid by citizens, including the majority of social care facilities, where public organizations procure care services and citizens pay for housing and

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

meals. As an example, 24-hour care for elderly individuals is estimated to require 6.7 million care days (Sotkanet, 2015). Municipalities pay 700 million EUR for this service, and citizens contribute 300 million in rent and meals. As shown in Figure 9, price compensations for eg. pharmaceuticals and healthcare are outside the definition of procurement.

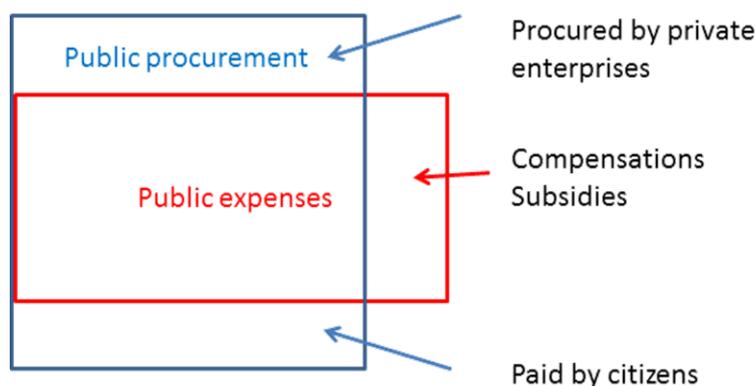


Figure 9. Public procurement and public expenses.

To date, PP research has neglected the major issue of procurement from in-house providers. However, research on public sector governance may have addressed that question. Procurement legislation restricts in-house entities' sales to the market. However, government entities do not have to follow procurement procedures if the supplier falls into the category of in-house procurement.

CONCLUSION

To date, no precise approach has been used to determine the financial amount of purchases in public organizations worldwide. This paper provides a totally new, precise solution to this problem. Calculations were based on data from Finland.

The present study used less common methods to analyze statistics and annual report data: quantitative data was analyzed using qualitative methods to provide an accurate assessment of PP volume. The calculation method is valid and is therefore replicable in other countries.

The bottom-up method based on annual reports gives better estimates of PP volume (52.2 billion EUR) than the SNA (37.4 billion EUR) or the notices database (14 billion EUR). This difference can be

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

attributed to the inclusion of corporations owned by public organizations in the bottom-up method. The new guidelines based on SNA 2008 recognize publicly owned corporations, but national-level statistics are not yet available or are only aggregated.

A limitation of this study is that it focuses only on Finland. Also, there are possible limitations regarding the accuracy of the procurement volume calculated for municipally owned corporations.

The present study revealed areas neglected by PP research. There are four recognizable parts of PP: 1) procurement under directives and national laws, 2) in-house entities and other G2G procurements, 3) procurement excluded from directives, and 4) small procurements. This research has implications for the appropriate management and governance of in-house procurement.

Further research should address in-house and G2G procurement because of their significant monetary value (10 billion EUR).

ACKNOWLEDGEMENTS

I would like to thank Jan Telgen, Michael Essig, Alessandro Ancarani, Christine Harland, and the participants of IPSERA 2015 conference for their invaluable contributions to this research.

REFERENCES

American Bar Association (2000). The 2000 Model Procurement Code for State and Local Governments. https://www.americanbar.org/content/dam/aba/administrative/public_contract_law/2000_aba_model_procurement.authcheckdam.pdf [Retrieved June, 9, 2017]

Audet, D. (2002). "Government Procurement 2002. A Synthesis Report." *OECD Journal on Budgeting*, 2 (3), 149-194.

Axelsson, B. & Wynstra, F. (2002). *Buying Business Services*. Chichester: John Wiley & Sons.

Bergman, M. (2008). *Offentlig upphandling och offentliga inköp – omfattning och sammansättning* (in Swedish). Research report for the Swedish Competition Agency. http://www.konkurrensverket.se/globalassets/publikationer/uppdrag_forskning/forsk_rap_offentliga_inkop.pdf [Retrieved February, 2, 2015]

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

Cernat, L. & Kutlina-Dimitrova, Z. (2015). "International Public Procurement: From Scant Facts to Hard Data." *Chief Economist Note*, EC Trade, Issue 1. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2682582 [Retrieved January, 1, 2017]

Coase, R. H. (1937). "The Nature of the Firm." *4 Economica*, 4 (16), 386-405. DOI: 10.2307/2626876

Cogburn, J. D. (2003). "Exploring Differences in the American States' Procurement Practices." *Journal of Public Procurement*, 3 (1), 3-28.

de la Iglesia, J. L. M. (2014). "Alternative Estimation of Public Procurement Advertised in the Official Journal as % of GDP Official Indicator Using Open Government Data." *Computers in Industry*, 65, 905-912.

Ellram, L. & Tate, W. (2016). "The Use of Secondary Data in Purchasing and Supply Management (P/SM) Research." *Journal of Purchasing and Supply Management*, 22, 250-254.

European Commission (1996): *Eurostat: European System of Accounts* - ESA 1995. <http://ec.europa.eu/eurostat/documents/3859598/5826305/CA-15-96-001-EN.pdf/aec2852-bed2-46d2-9534-5859d3c911d5> [Retrieved January, 14, 2014]

European Commission (2009), Directive 2009/81. <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1474273392624&uri=CELEX:02009L0081-20160101> [Retrieved December 15, 2014]

European Commission (2013) *Eurostat: European System of Accounts-ESA2010*. <http://ec.europa.eu/eurostat/documents/3859598/5925693/KS-02-13-269-EN.PDF/44cd9d01-bc64-40e5-bd40-d17df0c69334> [Retrieved December 14, 2014]

European Commission (2014a): Directive 2014/24. <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02014L0024-20160101> [Retrieved December 15, 2014]

European Commission (2014b): Directive 2014/25. <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02014L0025-20160101> [Retrieved December 15, 2014]

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

European Commission, International Monetary Fund, OECD, United Nations, & World Bank. (2009). *System of National Accounts 2008*. New York.

Flynn, A. & Davis, P (2014). "Theory in Public Procurement Research." *Journal of Public Procurement*, 14 (21), 139-180.

Harland, C. M. & Lamming, R., Cousins, P (1999). "Developing the Concept of Supply Strategy." *International Journal of Operations & Production Management*, 14 (6), 650-674

Hawkings, T., Nissen, M., & Rendon, R. (2014). "Leveraging Strategic Sourcing and Knowledge Management to Improve the Acquisition of Knowledge-Based Services." *Journal of Public Procurement*, 14 (2), 215-251.

International Monetary Fund. (2014). *Government Finance Statistics Manual 2014*. Washington, D.C.: IMF.

Kivistö, T. & Virolainen, V. M. (2017). "Analyzing Local and SME Participation in Public Procurement: Evidence from Seven Municipalities." In K. V. Thai (Ed.), *Global Public Procurement Theories and Practices* (pp. 83-97). Springer International, Cham, Switzerland

Knight, A. K., Blessner, P., Olson, B. A., & Blackburn, T. D. (2017). "Strategic Sourcing and Corporate Social Responsibility: Aligning a Healthcare Organization's Strategic Objectives." *Journal of Purchasing & Supply Management*, 23, 94-104.

Konkurrensverket. (2015). *Siffror och fakta om offentlig upphandling* (in Swedish), Report 2015:9. Konkurrensverket och Upphandlingsmyndigheten; Stockholm.
http://www.konkurrensverket.se/globalassets/publikationer/rapporter/rapport_2015-9.pdf [Retrieved January, 5, 2017]

Léon de Mariz, C., Ménard, C., & Abeillé, B. (2014). *Public Procurement Reforms in Africa*. Oxford: Oxford University Press.

Ministry of Finance (2009). Procurement strategy of the Finnish central government. *Valtion hankintastrategia 35/2009* (in Finnish). Available at http://vm.fi/documents/10623/307565/Valtion+hankintastrategia+35_2009/cc679a8b-fe34-4c05-9ece-8bac1a1f210c. [Retrieved June 24, 2015]

Murray, G. (2009). "Towards a Common Understanding of the Differences Between Purchasing, Procurement and Commissioning in

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

the UK Public Sector.” *Journal of Purchasing & Supply Management*, 15, 198-202.

OECD. (2010). “Public Procurement in EU Member States: The Regulation of Contract Below the EU Thresholds and In Areas Not Covered by the Detailed Rules of the EU Directives.” *SIGMA Papers*, 45, OECD Publishing: Paris. <http://dx.doi.org/10.1787/20786581>

OECD. (2015). “Size of Public Procurement.” *Government at a Glance 2015*. OECD Publishing: Paris. http://dx.doi.org/10.1787/gov_glance-2015-42-en

Patrucco, A. S., Luzzini, D., & Ronchi, S. (2016). “Evaluating the Effectiveness of Public Procurement Performance Management Systems in Local Governments.” *Local Government Studies*, 42 (5), 739-761.

Patrucco, A. S., Luzzini, D., & Ronchi, S. (2017). “Research Perspectives on Public Procurement: Content Analysis of 14 Years of Publications in the Journal of Public Procurement.” *Journal of Public Procurement*, 17 (2), 229-269.

Pegnato J. A. (2003). “Assessing Federal Procurement Reform: Has the Procurement Pendulum Stopped Swinging?” *Journal of Public Procurement*, 3 (2), 145-175.

Penttilä, S., Ruohonen, J., Uoti, A., & Vahtera, V. (2015). *Kuntayhtiöt lainsäädännön ristiiallokossa* (in Finnish). Vammala: Kunnallissalan kehittämissäätiö.

Prier E. & McCue C. (2009). “The Implications of a Muddled Definition of Public Procurement.” *Journal of Public Procurement*, 9 (3/4), 326-370.

Public procurement indicators 2011. (2012). *Public Procurement Indicators*. (no author) Available at http://www.eipa.eu/files/topics/public_procurement/public_procurement_indicators_2011_en.pdf. [Retrieved June 4, 2015]

Public procurement indicators 2015. (2016). *Public Procurement Indicators*. (no author) Available at <http://ec.europa.eu/DocsRoom/documents/20679>. [Retrieved December 12, 2016]

Scapper, P. R., Malta J. N., & Gilbert D. L. (2006). “An Analytical Framework for the Management and Reform of Public Procurement.” *Journal of Public Procurement*, 6 (1/3), 1-26.

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

Thai, K. V., & Grimm, R. (2000). "Government Procurement: Past and Current Developments." *Journal of Public Budgeting, Accounting & Financial Management*, 12 (2), 231-247.

UNICITRAL. (2011). UNICITRAL Model Law for Public Procurement 2011. http://www.uncitral.org/uncitral/en/uncitral_texts/procurement_infrastucture/2011Model.html [Retrieved December 12, 2016]

United States Government Accountability Office. (2005). "Best Practices: Using Spend Analysis to Help Agencies Take a More Strategic Approach to Procurement." *Journal of Public Procurement*, 5 (2), 244-273.

United States Government Accountability Office. (2015). *International Trade: The United States and European Union Are the Two Largest Markets Covered by Key Procurement-Related Agreements*. Washington, D.C.: GAO. Available at <http://www.gao.gov/products/GAO-15-717>. [Retrieved January 26, 2017]

van Weele, A. (2010). *Purchasing & Supply Chain Management* (5th ed.). Thomson Learning, London.

Watermeyer, R. (2004). *Project Synthesis Report: Unpacking Transparency in Government Procurement—Rethinking WTO Government Procurement Agreement*. CUTS International. <http://www.cuts-international.org/pdf/synthesis-report.pdf>

Williamson, O.E. (1985). *The Economic Institutions of Capitalism*. New York: The Free Press.

World Bank Group. (2016). *Benchmarking Public Procurement 2017*. Available at <http://bpp.worldbank.org/>. [Retrieved December 30, 2016]

World Trade Organization. (2013). *Statistics for 2008 Reported Under Article XIX:5 of the Agreement, Report by the European Union*. Available at https://www.wto.org/english/tratop_e/gproc_e/gpstat_e.htm. [Retrieved January 31, 2017]

DATA AND STATISTICS

[dataset] HILMA-notices 2013, <http://www.fsd.uta.fi/fi/>

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

[dataset] Statistics Finland: Educational Finances (OSF) ISSN=1799-0947. 2012, Appendix 1: Current expenditure on regular education system by type of expenditure 1995–2012 [quoted: 23.1.2015].

Saantitapa:

http://tilastokeskus.fi/til/kotal/2012/kotal_2012_2014-05-08_tau_001_fi.html

[dataset] Sotkanet: Service housing with 24-hour assistance for older people, care days in services provided by non-profit organizations or business enterprises.

<https://www.sotkanet.fi/sotkanet/en/taulukko/?indicator=s3b3AgA=®ion=s07MBAA=&year=sy4rAwA=&gender=t&abs=f&color=f>

[dataset] Statistics Finland: Operating economy, municipalities 2013

http://pxnet2.stat.fi/PXWeb/pxweb/fi/Kuntien_talous_ja_toiminta/Kuntien_talous_ja_toiminta_Kuntien%20ja%20kuntayhtymien%20raportoimat%20tiedot%201975-2014_Kunnat_ktt011_ktt111/?tablelist=true&rxid=0cc7f15a-1506-4b71-8f24-f4c8998721f4

[dataset] Statistics Finland: Operating economy by municipality 2013

http://pxnet2.stat.fi/PXWeb/pxweb/fi/Kuntien_talous_ja_toiminta/Kuntien_talous_ja_toiminta_Kuntien%20ja%20kuntayhtymien%20raportoimat%20tiedot%201975-2014_Kunnat_ktt011_ktt111/?tablelist=true&rxid=0cc7f15a-1506-4b71-8f24-f4c8998721f4

[dataset] Statistics Finland: Investments by municipality 2013

http://pxnet2.stat.fi/PXWeb/pxweb/fi/Kuntien_talous_ja_toiminta/Kuntien_talous_ja_toiminta_Kuntien%20ja%20kuntayhtymien%20raportoimat%20tiedot%201975-2014_Kunnat_ktt017/?tablelist=true&rxid=0cc7f15a-1506-4b71-8f24-f4c8998721f4

[dataset] Statistics Finland: Operating economy by joint municipal authorities 2013

http://pxnet2.stat.fi/PXWeb/pxweb/fi/Kuntien_talous_ja_toiminta/Kuntien_talous_ja_toiminta_Kuntien%20ja%20kuntayhtymien%20raportoimat%20tiedot%201975-2014_Kuntayhtymat_kytt021_kytt211/?tablelist=true&rxid=0cc7f15a-1506-4b71-8f24-f4c8998721f4

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

[dataset] Statistics Finland: Investments by joint municipal authorities 2013
http://pxnet2.stat.fi/PXWeb/pxweb/fi/Kuntien_talous_ja_toiminta/Kuntien_talous_ja_toiminta_Kuntien%20ja%20kuntayhtymien%20raportoimat%20tiedot%201975-2014_Kuntayhtymat_kytt027/?tablelist=true&rxid=0cc7f15a-1506-4b71-8f24-f4c8998721f4

[dataset] Kirkkohallitus: Seurakuntien talous 2013
<http://sakasti.evl.fi/sakasti.nsf/sp?open&cid=Content3E9E46>

Satamaliitto: Satamat tuloslaskelma 2013.

[dataset] Energiamarkkinavirasto: Sähköverkonhaltijoiden, muiden sähköliiketoiminnan harjoittajien, maakaasuverkon haltijoiden, maakaasun myyjien eriytetyt tilinpäätökset 2012
<https://www.energiavirasto.fi/sahko-ja-maakaasuyritysten-eriytetyt-tilinpaatostiedot-vuodelta-20121>

[dataset] Työttömyyskassojen yhteisjärjestö: Työttömyyskassat, Jäsenyys ja talous 2012
https://www.tyj.fi/...php/1/...talous_2012/018a415b328ede3e9396e32a0b5ee9ca

'This article is © Emerald Publishing and permission has been granted for this version to appear here (LUTpub.lut.fi). Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.'

Publication II

Kivistö, T., Grudinski, D., Hallikas, J. & Sintonen, S.

Innovative procurement processes and their use in social and healthcare sector

Working paper

International Public Procurement Conference

Dublin 2014

© authors, 2014

Innovative procurement processes and their use in social and healthcare sector

Timo Kivistö^{ab},

Daniela Grudinschi^c, Jukka Hallikas^d, Sanna Sintonen^e

Timo Kivisto Consulting Ltd^a

Ylistörmä 5 E

FIN-02210 Espoo

timo.kivisto@kivistoconsulting.fi

Lappeenranta University of Technology, Department of Business Administration^{b, c, d, e}

PO BOX 20

FIN-53851 Lappeenranta

Abstract

Innovative public procurement can be innovative objects where the purchasing object itself is innovative. Those can be procured by general or innovative procurement procedure. The other dimension is where the method of public procurement is innovative. We examine in this paper innovative procurement processes including organizing innovative procurement, procurement strategies and sourcing process.. The processes are identified from literature research and practical cases both from the public sector and private sector, including procurement of existing products or services and those to be developed. They can be innovations made within the organization, which could be procured from outside service providers as a service or as consultancy where the service is performed by the organization itself. The innovative processes are assessed towards a large innovation case base in social and healthcare sector from Finland, Sweden and UK. An analysis will show which kind of procurement processes are needed for the case base and which innovative procurement processes still could be used in public procurement. Due to public pressures to increase the effectiveness and end-customer value creation in public organizations and services, it is essential to pay attention on developing new innovations and innovativeness in the public procurement. However, there is only limited number of research conducted on innovation practices and types in the public procurement.

Previous research

Innovation in purchasing and supply management

Innovative purchases and innovation in the purchasing management has achieved a lot of both managerial and academic attention in the recent years. Especially, the public sector interest towards more differentiation and demand based approaches in comparison to competition through price has provided attention in the policy making and practical management of purchases (Edler and Georghiou 2007). It has been recognized that in various purchasing categories innovativeness may provide better performance outcome for the public organizations than reduced purchasing price. In this section we briefly outline the forms of innovativeness in the purchasing and supply management.

There are various types of innovations that can be used to identify the purchasing objectives in the innovation process. Innovation in the supply chain involves changes in product, process, or service that either reduce cost or improve efficiency, thereby increasing customer satisfaction (Roy, et al, 2004). Innovations can be classified into incremental and discontinuous ones. According to Phillips et al. (2006), close supplier relationships are supposed to favor incremental innovation, while new and temporary relationships should favor discontinuous innovation. It is also possible to classify innovations based on their role value chain into product and process innovations. Product innovations which may be physical products or services have a direct connection to the customer. Process innovations, on the other hand, are often dedicated to improve the effectiveness of the supportive actions in the supply chain. This distinction is not always very clear since many services may be seen as both products and processes. Innovation is not just important in the supply chains of physical products but also processes and services have an essential role in the innovation management.

In order to identify the nature of innovation in the purchasing and supply, we have made an investigation on existing research conducted in this field. The main findings of the review have been presented in the Table 1. The purpose of the review has been to identify the sources of innovativeness in the purchasing.

Table 1. The sources of innovation in purchasing and supply.

Sources of Innovativeness in purchasing and supply	Sources
Supply chain and purchase process development	McGinnis and Vallopra, 1999; Croom, 2001
E-commerce and ICT applications in supply chain	Croom, S., 2001, Min and Galle, 1999, Monczka et al. 2010
Early supplier involvement and supplier innovativeness in product and service development	Wynstra et al 1999, Zsidisin and Smith, 2005, Schiele 2006, Schiele 2010, Monczka et al. 2010
Creating an innovation seeking demand and a market	Edler and Luke Georghiou, 2007
Sustainability in product development	Green and Morton, 1998
Integration of supply management in the innovation strategy and R&D roadmap	Schiele 2010, Monczka et al. 2010
Tradeoff business analysis between price and innovation	Monczka et al. 2010
Innovation workshops with key suppliers	Monczka et al. 2010

In the first category, supply chain and purchase process development has been recognized as an important source of innovation. Here, the purchase process re-engineering and automation of supply chain processes may have an essential impact on structure and effectiveness on purchasing (Croom, 2001). According to McGinnis and Vallopra (1999). Production and operations process development/improvement is a significant contributor to competitive advantage and purchasing is more likely to play a major role in process development/improvement when the importance of process as a source of competitive advantage is considered to be high. Leaner and faster processes may result in cost savings and increased customer satisfaction due to lesser manual work, faster delivery speed, and reduced failure rate.

Strongly related to the process development, the E-commerce and ICT applications in supply chain plays an important source of innovativeness in purchasing (Croom, S., 2001, Min and Galle, 1999, Monczka et al. 2010). Incremental innovation focus merely on the reduction of administrative costs by automating the manual processes (Croom, 2001). More sophisticated approaches cover the the ability to use the Internet to seek new suppliers (Croom 2001) usage of e-system approached to acquiring supplier innovation ideas (Monczka et al. 2010). It has been recognized that suppliers can serve as important source of innovation by bringing new ideas, concepts and reducing the development time of services and products significantly (Min and Galle, 1999).

Perhaps the most popular research stream in the purchasing innovation management is related to Early supplier involvement and supplier innovativeness in product and service development. This ESI approach addresses the collaborate with suppliers in developing or implementing certain Innovations (Wynstra et al 1999). In other words, it seeks to get innovations out from the suppliers by developing clear collaborative processes for the early involvement of suppliers. Advantages of such an early involvement include *reduces product development cycle time, improvements in the product quality, enhancements in the utilization of supplier expertise, improvements in the management of costs, and decreasing the supply risks* (Zsidisin and Smith, 2005). a new task for purchasing arises, as firms need to understand which suppliers actually do have high potential contributing to the innovativeness of the firm and which do not (Schiele 2006).

There are also important categories on purchasing innovation, which may be for purchasing organizations looking for innovations. Edler and Georghiou (2007) have addressed the use of public demand as an engine for innovation public demand, and more into the focus of innovation policy making. They argue that traditional supply-side innovation policies are insufficient to meet the challenges posed in promoting competitiveness. Thus there is a need for creating an innovation seeking demand and a market. Edler and Georghiou (2007) identified several application areas: e-Health, Pharmaceuticals, Energy, Environment, Transport and Logistics, Security, and Digital Content as possible sectors for innovation. The recent trend of sustainability in product development should also be taken into account when considering the ability to use market mechanisms to persuade suppliers to innovate or increase environmental performance (Green and Morton, 1998).

The recent research by Monczka et al. (2010) identifies additional areas of innovation in purchasing and supply management. They address the importance of the Integration of supply management in the innovation strategy and R&D roadmap. According to Schiele (2013) technology roadmaps can be used to bridge NPD strategies and sourcing strategies by including the supply network design as a step in roadmap formulation and including purchasing

professionals in its formulation. Monczka et al. (2010) also identifies the significance of making tradeoff business analysis between price and innovation, and organizing innovation workshops with key suppliers.

The current research has focused mainly on the how suppliers' enhance the innovation of purchasing organization and how suppliers are connected early in the development processes of the firm. However, more research is needed also on the factors of innovativeness of purchasing organization itself and classification of purchasing-related innovation types.

Theoretical background

The definition of innovation by OECD

Based on the innovation management literature, there are several types of innovation types that can be used for different purposes (Tidd et al, 2005). The OECD Oslo Manual for measuring innovation defines four types of innovation: product innovation, process innovation, marketing innovation and organizational innovation.

A product innovation means a good or service that is new or significantly improved. This includes significant improvements in technical specifications, components and materials, software in the product, user friendliness or other functional characteristics.

A process innovation means a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software.

A marketing innovation means a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing.

An organizational innovation means a new organizational method in business practices, workplace organization or external relations.

The definition of innovation in purchasing context

An innovation is an invention commercialized on the market by entrepreneurs (Schumpeter 1939). In purchasing context this means that the purchasing object is an innovation, and it is new to the purchasing organization.

In case on marketing innovation we can recognize pricing, and in procurement terms in which way the procurement unit is asking the prices.

The customers of public procurement

In public procurement there are several types of customers. The end-user is using the service, but pays usually nothing or a small percentage of the cost. The relatives of the end-user are an important customer group especially if the end-user has a limited capability of deciding for himself (eg. children, mentally ill, handicapped, elderly with dementia, patient in coma). The relatives can be responsible for paying the end-customer payment of the service. The end users usually have commercial customer service values. The landscape of customers was also recognized by Yeow and Edler (2012).

The third type of customer is the paying customer, normally the public entity, which pays the majority of the cost. The management typically has customer service and economic values. Within the paying customer there are internal customers, like the management, unit chefs and employees. They have commercial customer service values. These customers are called congeneric customers by Hommen-Rolfstam (2009).

Public entities are governed by politicians who may have political values. The political values can be economic – usually redirected to less cost reductions elsewhere, financing better political objects or less taxes. There are rational political values as environmental, social politic values and local economic development values. In addition there can be party or individual political values.

An indirect customer is the employer of the end-user. By the Finnish legislation the employer pays the employee the salary or wages during the day of getting ill and 9 following working days. After that the employer gets compensation from the Finnish social security agency, which is the second indirect customer, financed by the Finnish taxpayers.

A direct customer can in certain cases be only the end user with 100% self-financing responsibility. In these kind of procurement cases the public entity qualifies one or several suppliers for the end users. These are used eg. for supportive services as cleaning. These are called extrinsic customers by Hommen-Rolfstam (2009).

Different aspects of innovative procurement

Product novelty can be either novelty products or services ready to use. Yeow and Edler (2012) call these off-the-shelf products. Hommen and Edler (2009) call these late phases of evolution. The second type is innovative products or services to be developed in a reasonable time. The third type is technology roadmap sourcing meaning development activities during the lifecycle of the product. These earlier phases are called early or middle phases of evolution by Hommen-Edler (2009)

The innovative product can either be demand originated or created by technology push. These are not necessarily opposite approaches, because technology push starts with opportunity analysis or market research. Technology push can create radical improvements whereas customer demand usually has incremental improvements as results (Brem et al).

There are different scopes of the requirements definition. In services the wording can be resources, process, end product or value (Axelsson, Wynstra) In products innovative approaches can be expressed in criteria eg value for a certain purpose (pedagogical). There is also a third type of innovative procurement used by innovation funds or procurement programs: performance-based acquisition (Federal Acquisition Central). This type is quite near to buying value. Usually the accepted projects are assessed by a jury.

The innovative procurement can by Hommen, Edler (2009) be either for direct (intrinsic), congeneric need (shared by buyer and other organisations) or catalytic (extrinsic needs, pertaining to other actors than buyer organisations). These catalytic needs are mentioned in innovation policy.

Procurement processes for innovative public procurement

Deducting from literature and we need to define the required purchasing processes as follows.

1. Defining the scope of the purchasing object

In defining the scope we can use make-or-buy analysis for the ongoing services. The question is typically whether outsourcing is more economic or offers more quality for the same price. The outcome of the analysis can also be insourcing the services.

A subquestion to this is make-or-buy analysis for development of operation and change management. Do we buy them as a part of ongoing services or separately.

The second aspect of the scope is strategic decision of ownership of premises. Within purchasing definition this falls under the definition of make-or-buy decision, but in administrative sciences this is called ownership strategy.

The third aspect is evaluation of congeneric or extrinsic needs. (Hommen, Rolfstam). Can the purchasing object have other users than the buyer organization. In case of social services there can be qualified suppliers for wholly customer paid services.

The fourth aspect is life-cycle cost. This is considered in public-private partnerships or variations of it. The second application is life-cycle cost of people to be cared – in case of early cure there is possibility to avoid longer or more expensive care periods.

The fifth aspect is technology as an opportunity (technology push) or public technology procurement (need pull). In this aspect the public entity is procuring a product or service which is to be developed within a reasonable time. This can require one supplier or a network of suppliers.

2. Defining the customer types

In case of congeneric and extrinsic scope the customer types shall have to be defined.

3. Defining the customers within the customer types

Within the customer types there are different groups as customer with their own values. In social and healthcare there are end-customer, their relatives, the management of the public entity, personnel of the public entity and the politicians.

4. Defining customer values

The first subset of value is general customer service values, in this paper looking in social and healthcare. Andreasson, Winge (2010).



Figure 1: Customer service in social and healthcare

The second subset is measurable service or product specific values, especially in social and healthcare. Examples of these are RAI-measurement of elderly people.

The third subset is widely accepted values such as environmental values or social values. These values have roots in politics eg. environmental politics or social politics.

The fourth subset is savings, especially in procurement terminology. In purchasing the economics is measured by cost reduction, which can be caused by lower unit prices or demand reduction. The indirect economic value is measured by the salary or wages of the employee and the daily payment from the Finnish social security agency.

The fifth subset is other economic values than savings. Innovative procurement can be catalytic sourcing for products and services, which can be bought by extrinsic customers or beyond the scope of the purchasing object.

The sixth subset is political values beyond the widely accepted values. These can include party politics, local politics or individual politics.

5. Reverse marketing for innovations

Reverse marketing for innovation means an active statement for searching innovations and promoting that to suppliers. It can mean specific user driven innovations, value based innovations or technology push innovations. In order to function properly the suggestion shall have to be handled in a reasonable time.

6. Supply market research / search for innovations

According to von Hippel (1988) innovations can be found from customer, competitors or suppliers. Monckza et al (2010) recognizes additionally government research, universities and other sources. Let us look at competitors and suppliers.

Public units typically have no competitors, so the relevant term can be similar kind of domestic or foreign organisations.

Suppliers can be further classified from innovation point of view as follows:

- direct material suppliers
- direct service suppliers
- indirect equipment suppliers
- indirect service suppliers (development and planning)
- machinery investment suppliers
- construction investment planners
- construction investment suppliers (complex product systems)
- 2nd-tier suppliers
- network of suppliers

7. Competition set-up

After we know values and suppliers we must decide from which supplier group the innovations may be asked.

Secondly we must decide the scope of RFP, whether we are sourcing the lifecycle of the customer or just coordinating services, and are there catalytic possibilities

Thirdly is the change or development process within or out of scope.

Defining whole or partial orders will serve goals for multiple SME suppliers versus the economics of scale from large companies.

Fifthly we must separate the large volume bulk products from innovative framework agreements with small monetary volume.

8. Determining the initial purchasing requirements

This means by O'Brian (2012):

- regulatory requirements
- assurance of supply
- quality
 - specification based on previous 4 phases (among other things)
- service
 - general service requirements
- cost / commercial
 - savings goals
 - other economic values
 - commercial terms and conditions
 - incentives for innovation benefits
- innovation
 - capabilities for innovation
 - arrangements for sharing and collaboration

9. Determine quantity for RFP

For RFP the quantity of requested products and services must be collected.

10. Determining supplier requirements

Supplier requirements from public procurement law are compulsory. In addition to those there can be RFP specific qualification metrics, eg. credibility of the company, references.

11. Determining the award criteria

The award criteria can incorporate quality aspects, innovation and other aspects. With the current market court practice the evaluation metrics must be defined in advance, so this part inhibits the innovation potential.

12. Select procedure

For innovative procurement we can use standard procedures, if only the object is innovative. If special procedures are needed, we can use precommercial procurement, negotiation procedure and competitive dialogue.

13. Notice

Legal notice shall be sent to OJEU for procurement over threshold value.

14. Request for proposal

In terms of innovative procurement we can use the standard procedure. The innovative part comes in questions and answers and when using negotiation or competitive dialogue.

15. Proposal evaluation

Proposal evaluation is processed in three phases. First the supplier must be qualified, secondly the proposal must correspond the RFP document requirements. In the third phase the proposal are evaluated with award criteria. This third phase is for innovative procurement the difficult one, because the award criteria shall have to be decided in advance.

About the social and healthcare sector in Finland

The framework can be classified in three categories: healthcare, social and non-social-healthcare. Healthcare is financed by municipalities, partly by the national government subsidies compensating the differences in demographics. Every municipality is a member in a hospital district producing special health care. The primary care is either produced by municipalities themselves or by social-healthcare cooperation organizations.

Besides the public healthcare service there is the private sector. Private healthcare companies provide outpatient services and limited selection of surgeries. The customers get a subsidy from the Finnish social security agency, but the amount to be paid by the customers is the larger share. The private sector has also a large market share in occupational health care service.

Social care includes services for citizens with descended ability. The main categories for publicly financed social care are elderly care, handicapped care, foster care, mental care, care for drug abused. The services are partly produced by municipalities are social-healthcare cooperations, but also procured from outside service organizations.

The non-social-healthcare activities can affect the physical, mental and social welfare. Those activities can be produced by the municipality (eg. schools, sports facilities, libraries), non-public organizations (eg. associations, sporting clubs) or by citizen-to-citizen interaction (eg. neighbours). These matters are not discussed in this paper.

Analysis of the innovation objects

Innovation organisations

Innovations were sought from national innovation bodies: Tekes in Finland and Vinnova from Sweden. They are innovation financing bodies. From Tekes the project catalogue with enterprise projects and research projects was analysed. From Vinnova two idea papers were analysed.

The second case source was the innovation units of healthcare providers: SLL Innovation from Sweden and NHS Innovation from UK. The case material is from NHS SW, where was a collection of service innovations.

These cases represent only very limited amount of innovations made in the social and healthcare sector, but it is meant to be an exploratory research what kind of innovations there are and further used to analyse how to procure this kind of innovations. There could be a larger proportion of materials and equipment in other parts of NHS:

The case base contains 43 cases from Swedish Vinnova material, 53 cases from Finnish Tekes material. From national healthcare organisations 30 cases from British material and 35 cases from Swedish SLL Innovation.

Discussion

About the organizations

The innovation bodies of the healthcare providers were concentrated in spreading and commercializing the inventions made by the personnel. In addition to that they provided services for enterprises for evaluation and certification of their products. Striking was that they did not seek innovations from the market.

Formulation of the potential procurement objects

From the case base we can examine what kind of procurement object we should have in order to achieve the innovations. Therefore we have classified the cases into different procurement categories as follows with the number of cases. The decision between development and services is made upon that where the innovation is, in mostly in services.

Cases by type	All
Development of individual services	3
Development of several services	2
Development of services, technology and premises	2
Coordinating services	21
Services	43
Supporting services	3
Enabling technology	61
Materials	19
Premises	2
Other	11
Together	167

Table 2: Cases by type

Purchasing process compatibility to types of procurement objects

The development objects can be bought by development suppliers either consultants or engineering companies. That affects the choice of which supplier group you are searching the innovation. The same question can be made for coordinating services, services, enabling technology and premises.

The same object groups face the question of make-or-buy decision for development ie. do we buy the changes with an implementation project.

When we investigate the objects in enabling technology and materials, we can recognize that many of these innovative objects are designed for special circumstances or rare kind of patients. When public organizations make RFP:s for

healthcare materials or rehabilitation equipment the focus is in large procurement volume products whereas these innovative products are likely to be small procurement volume products and likely to be out of the RFP. Therefore it could be advisable to introduce RFP for framework agreement of innovative products. The product can be evaluated on innovation values.

For coordinating services we need to choose whether we buy the coordinating services with or without the services to be coordinated. If we choose to buy only the coordinating services it is near the project management contracting in building premises, where the project management company receives a fixed fee for controlling. This method enables smaller risks because the different contracts are smaller and there is more competition. In social and healthcare it means also that the coordinated services can be both from the public entities and from other sources. If we choose to buy all the services from one company there is likely to be more risks calculated or causes inflexibility to services.

In the cases technology push was recognized in SLL cases where they evaluated innovative products for the suppliers on a contract basis. Supplier market research was not mentioned in cases nor in the organization profiles.

The innovative parts of the procurement process are defining the scope, competition set-up and determining the requirements for innovative purposes. In commercial requirements the need for incentive for innovation must be mentioned. In all these procurement innovation phases we need collaboration with potential suppliers.

The public procurement legislation does not mainly affect the innovative public procurement. The requirements and criteria must be non-discriminative and the evaluation of criteria must be based on beforehand known principles.

Conclusion

From the case base we can conclude that there are many mature innovations available, but few are searching them. National innovation bodies and those parties seeking financing from the innovation bodies want to make their own inventions. The second problem lies in that these innovations are small in monetary volume and thus not interesting for commercial players. Framework agreements for innovative products would help the situation.

The second theme which is not addressed in this paper that in social and health care there seldom is a development organization. In Yeow and Edler the Assistant Nursing Director was the development organization which was reinforced with a testing team in later stages of the development. This matter needs additional research about the research and development landscape in public entities.

The third theme raised in this paper was the customers and their values. In public entities there is little research of customer satisfaction detailed in different customer types. In Yeow and Edler it was recognized that in the initial phase they did not know the real needs, which in turn had to be revised in the testing phase.

The legislation itself does not inhibit innovative procurement. The challenge is rather making requirements as end products instead of dictating how to perform processes. Another aspect is searching value from procurement contracts. In terms of savings we should have a supplier-buyer discussion forum about principles for innovative procurement. This would concern code of conduct for proprietary information, incentive structures for idea and realizing benefits.

References:

Ashenbaum, B, 2006, Defining Cost Reduction and Cost Avoidance, Center of Advanced Purchasing Studies,

Andreasson S, Winge M (2010), Innovations for sustainable social and health care, Vinnova report 2010:2

Axelsson, B, Wynstra F (2002): *Buying Business Services*, John Wiley & Sons, Ltd.,

Croom, S. (2001) Restructuring supply chains through information channel innovation, *International Journal of Operations & Production Management*, Vol. 21 No. 4, pp. 504-515.

Brem, A, Voigt, K-I (2009), Integration of market pull and technology push in the corporate

front end and innovation management—Insights from the German software industry, *Technovation* 29 (2009) 351–367

Edler, J., Georghiou, L. (2007) Public procurement and innovation—Resurrecting the demand side, *Research Policy*, Vol. 36, pp.949–963.

Federal Acquisition Center http://www.acquisition.gov/comp/seven_steps/library/SevenSteps_execversion.pdf

von Hippel, E (1988), *The Sources of Innovation*, Oxford University Press

Hokey Min, William P. Galle (1999) Electronic commerce usage in business-to-business purchasing, *International Journal of Operations & Production Management*, Vol. 19 No. 9, 1999, pp. 909-921

Hommen, L, Rolfstam M (2009) Public Procurement and Innovation – Towards a taxonomy, *Journal of Public Procurement*, Volume 9, Issue 1, 17-56

Hovlin, Arvidsson, Hjorth, Ljung (2011) Tjänsteinnovationer i offentlig sektor, *Vinnova Rapport VR 2011:12*

Gonzalez-Padron, T. G. Hult, T., Calantone, R. (2008) Exploiting innovative opportunities in global purchasing: An assessment of ethical climate and relationship performance, *Industrial Marketing Management*, Vol. 37, pp. 69–82.

Green, K., Morton, B., New, S. (1998) Green purchasing and supply policies: do they improve companies' Environmental performance? *Supply Chain Management*, Vol. 3, Number 2, pp. 89–95.

NHS Innovations SW, <http://www.nisw.co.uk/innovation-showcase/long-term-conditions-case-studies.aspx>, read 14.4.2013

McGinnis, M.A., Vallopra, R. (1999) Purchasing and supplier involvement in process improvement: a source of competitive advantage, *The Journal of Supply Chain Management*: Vol. 35, Issue 4, pp. 42–50.

Monczka, R.M., Carter, P.L., Scannel, T.V, Carter, J.R. (2010) Implementing Supplier Innovation: Case Study Findings, CAPS Research Papers.

O'Brian J.(2012), *Category Management in Purchasing*, Kogan Page, 2nd edition

Phillips, W., Lamming, R., Bessant, J., Noke, H. (2006) Discontinuous innovation and supply relationships: strategic dalliances, *R&D Management*, Vol. 36, Issue 4, pp. 451–461.

Schiele, H. (2006) How to distinguish innovative suppliers? Identifying innovative suppliers as new task for purchasing, *Industrial Marketing Management*, Vol. 35, pp. 925–935.

Schiele, H. (2010) Early supplier integration: the dual role of purchasing in new product development, *R&D Management*, Vol. 40, Issue 2, pp. 138-153.

Schumpeter, J. A. (1939). *Business cycles : a theoretical, historical and statistical analysis of the capitalist process*. McGraw-Hill, New York.

Sivakumar, R.S., Wilkinson, I.F. (2004) Innovation generation in supply chain relationships: A conceptual model and research propositions, *Journal of Academy of Marketing Science*, Vol. 32(1), 61-79.

SLL Innovation (2011), Årsberättelse 2010-2011

Tekes, Innovaation sosiaali- ja terveystalvelujärjestelmässä 2008-2015, projektit

Vinnova (2012) Idékatalog, Sociala innovationer för äldre, *Vinnova information VI 2012:3*

Wynstra, F.", van Weele, A., Axelsson, B. (1999) Purchasing involvement in product development: a framework, *European Journal of Purchasing & Supply Management* Vol. 5, pp. 129-141.

Yeow J, Edler, J (2012) Innovation Procurement as Projects, *Journal of Public Procurement*, Volume 12, Issue 4, 472-504

Zsidisin, G, Smith, M. (2005) Managing supply risk with early supplier involvement: A Case Study and Research Propositions, *Journal of Supply Chain Management*, Vol., 41, Issue 4, pp. 44–57.

Publication III

Kivistö, T., & Hallikas, J.
Processes for innovative public procurement

Working paper
25th Annual IPSERA Conference
Dortmund 2016
© authors, 2016

Processes for innovative public procurement

Timo Kivistö^{ab} Jukka Hallikas^c

^a Timo Kivistö

Timo Kivisto Consulting Ltd

Ylistorma 5 E, FIN-02210 Espoo, Finland

Tel. +358 9 8811749, e-mail: timo.kivisto@kivistoconsulting.fi *Corresponding author*

^{b,c} Lappeenranta University of Technology

School of Business and Management

P.O. Box 20, FIN-53851 Lappeenranta, Finland

Working Paper

Summary

The aim of this paper is to study of processes for Innovative Public Procurement, applied in a local government joint procurement unit. The objective of these innovations is to apply a service innovation typology, which is analyzed across a large innovation case base in the social and healthcare sectors in Finland, Sweden, and the UK. After the analysis to develop a typology of innovative procurement processes for the case base, thereby contributing to the existing literature on purchasing and supply management. Managerially, better insights on innovation types provide better possibilities to develop manage purchasing innovation processes more effectively. This study also highlights possible structures for innovation processes.

Keywords: public procurement, innovation, processes

Previous research

Innovations and early supplier involvement have been mentioned in various studies (Schiele, 2010; Luzzini and Ronchi, 2011). These industry studies focused on organizing a purchasing department for innovation procurement, in collaboration with the R&D department, mainly with largest suppliers. Luzzini and Ronchi (2011) identify three types of organizations for purchasing departments: (1) dedicated, where the purchasing department is the only connection with the supplier, (2) integrator, where the risks are not so high but the PD is still the only connection with the suppliers, and (3) coordinator, where other departments can also have contact with suppliers. Schiele (2010) similarly points out the dual role of the purchasing department: it both controls the lifetime performance of the supplier and makes its best effort for new product development.

Innovations in service businesses differ from product businesses in the role of an R&D department (Nijssen et al., 2006). "Together with the organization of NSD around customers' market pull, this suggests a smaller role and influence of the R&D department in service development." p.242. When making radical innovations the role of R&D is significant. According to Keeley et al.,(2013), innovation almost never fails due to lack of creativity rather than because of a lack of discipline. Innovations in the public sector face organizational challenges, because in many cases there is no R&D department (Yeow and Edler, 2012; van Putten, 2012). On the other hand, Rolfstam et al. (2011) write that in the NHS there were 23,000 research projects going on during one year.

Commissioning determines the broad ideas of what paying customers and user customers are looking for. Edquist (2009) takes a broader view when looking at products and services which do not exist. It is a matter of matching the broad objectives to the supplier network possibilities. This matchmaking can use several different means (Edquist 2009). (1) Researchers of various brands may identify socioeconomic needs and societal problems; this refers to NHS format – long term condition – priorities. (2) Needs and problems may also be articulated by public opinion, as in Keeley's category innovation process. (3) Politicians may contribute to agenda setting and priorities by pointing out problems that they want to solve. (4) A potential public procuring agency may try to specify the "functional requirements" of the product or system required, to satisfy certain needs or solve societal problems. This approach is supported by Yeow and Edler (2012) and van Putten (2012). (5) Finally, firms that may potentially supply the new products must not be passive. They should signal what they think they can do within a reasonable time if demand is created; they must contribute by proposing ways to go forward.

Edquist (2009) suggests that this interactive learning – or in purchasing terms, early supplier involvement – should be multidisciplinary, and is likely to occur several times. Schiele (2010) mentions two tools for early supplier involvement: technology roadmaps and innovation workshops. Both can be seen as broad ideas of what the customers are looking for. He also mentions that aside from working with existing suppliers, there is a need to scan alternative suppliers or technologies. Early supplier involvement can thus start in the early phase of evaluating the broad ideas what the paying customers and user customers are looking for, as with the NHS-format: what the most important long time conditions are, and what the priorities and benefits are. These are starting points for a technical dialogue with supplier networks or sources of innovation.

Salge et al. (2013) demonstrate that six specific sources of information are likely to be optimum. The greatest source of information is the users. Risk management issues can prolong the early phases, as investigated by Kalvet and Lember (2010). Arlbjorn and Freytag (2011) recognize two types of processes for innovative procurement. The first type has stages; in the first stage the procurer seeks out the innovation and in the second stage he or she solicits bids for supplying/producing the product or service. The second type has only one stage, where bids are asked for both innovations and supplying them. Risk management efforts support using several steps in the procurement process: supplier market and technology scans, carefully selecting a short list of suppliers, and additional steps of prototyping. In many cases consultants were used. Risk management also affects contract design.

Rolfstam et al. (2011) raise the question of innovation diffusion and find several barriers that could be overcome. They include proof of the benefits for the organization and access for the innovations in normal ordering channels, and there is also a product champion in the using organization promoting the product or service. The innovative product can either be demand-originated or created by a technology push. Edler and Georghiou (2007) note that about 50% of innovations are demand-driven and 12% come from suppliers. A technology push can create radical improvements whereas customer demand usually results in incremental improvements (Brem et al., 2009). Enabling a technology push is an important objective when designing processes.

The implementation of innovation seems to be a specific problem. There can be conflicts on strategic, operational, and individual levels (McAdam, 2005). Yet there are examples of better results (Bloom et al., 2012). Edler and Georghiou (2007) also highlight this fact in relation to radical innovations. Rolfstam et al. (2011) investigated the challenges of one implementation

case. Some of the innovations are off-the-shelf products, which could be implemented whenever they are procured (Rolfstam et al., 2011; Yeow and Edler, 2012).

The objective of this paper is to study the types and categories innovative procurement and develop suggestions for innovative public procurement. This phenomenon will be assessed in a local government joint procurement unit, which will decrease the transaction costs for making a framework agreement but also lowers the risk for a potential failure in innovative procurement.

Methodology

In this study both archival and secondary data sources are used. In this way, we can make a typology of a larger number of cases than if we used primary data alone (Calantone and Vickery, 2010). The Finnish data sources were from the Tekes project catalogue, the Swedish sources were from Vinnova idea catalogs, and those from the UK were Innovation Case descriptions of National Health Service (NHS) South West. The cases which did not have a detailed description were excluded. As we were looking service innovations we excluded material or equipment cases. Altogether, 106 cases were analyzed.

These data sources can give an optimistic view of innovation, as each of these organizations actively promote innovation. In that respect they feature the fifth phenomenon in the Alvesson framework: moral storytelling and promotional Activity (Alvesson, 2003). The data is reliable in the sense that the cases presented have been approved by innovation bodies to be categorized as innovations. The project descriptions might have been produced when the project was approved for innovation funding, and we do not know if the presented innovations were ever put in operative use.

As this study is exploratory it has no intention to be quantitatively reliable, but rather to categorize different kind of innovations in order to design procurement processes that support the different categories of innovations. These exploratory findings will be related to existing theory, and additional cases will be examined to fill in the missing points. The reliability of the categorization has been increased by tandem evaluation to reduce the researcher bias.

Analysis of the innovation objects

We use the database of innovation objects from Finland, Sweden and the UK to identify innovation cases by type. Altogether 107 cases were analyzed and 261 innovations identified.

In this paper we analyze the case base through a service innovation lens, utilizing the Keeley framework introduced in Tekes (2007). The service innovation aspects are: (1) innovation process, (2) core process, (3) product/service performance, (4) service system, (5) customer service, (6) channel, (7) brand, (8) customer experience, (9) business model, and (10) value network.

For easier categorization, we added several definitions: (a) Customer service is separate customer service; if the core service is face-to-face it is not categorized as customer service. (b) Product or service performance may produce better results and/or a shorter care period. This is not categorized as customer experience unless mentioned in the case description. (c) Channel means a sales channel for enterprises or the use of electronic means of distributing the service.

The Table 1 is illustrating the total number of different innovations identified in the cases.

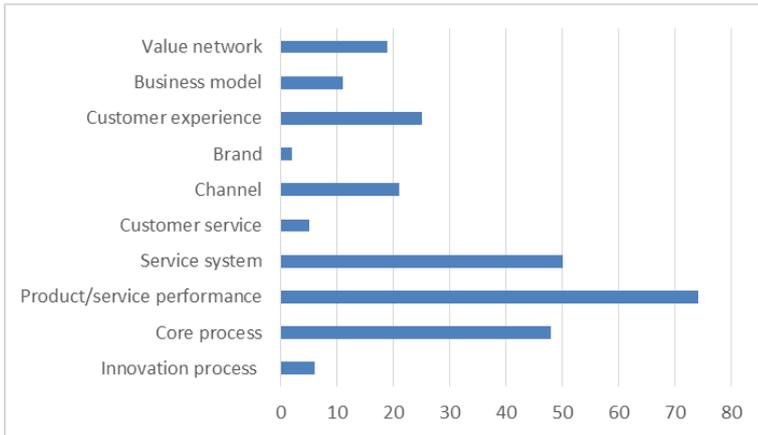


Table 1 Total number of different innovations identified in the cases

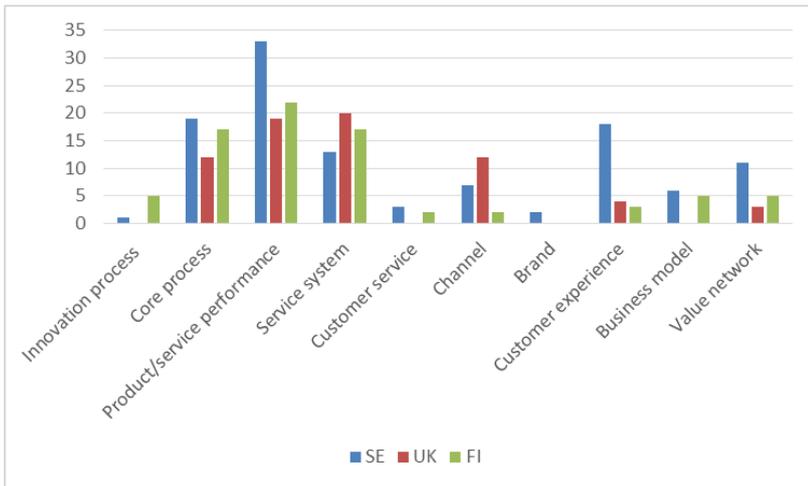


Table 2 Innovation types in the studied countries

The realization of innovation types were also analyzed according to countries as shown in Table 2. In Sweden the customer experience and also customer service innovation types are higher than in other countries. There is higher number of innovations based on channel in the UK. Furthermore, innovation types based on business model and value network are more typical in Sweden and Finland than in UK.

The innovation process was sometimes revealed in simple processes, like asking users or customers what they want. In the Lauttasaari model the care manager offered various services from splintered providers. There was also a service architecture competition (Marja-Vantaa) and a competitive negotiation procedure (Tuusula healthcare center).

Core processes mean that the process is done in a new way. An example of this is the control list procedure in Johns Hopkins hospital. This quality procedure helps prevent infections. Other examples are using electronic tools for healthcare like iDoc24 for skin problems or the European Telemedicine Clinic's X-ray analysis. Coordination services were also represented in the case base, e.g., the fast track for MS-patients in Gloucestershire Trust.

The technical product or service performance was the main category. In the social and healthcare sectors the main areas were preventive services to avoid admissions, or means to have patients released to go home as soon as possible. Two examples of the former are a personal trainer for the aging in Region Skåne, and improved self-care for diabetes. An example of the latter is the project 'from Coxa to home', and early supported discharge of stroke patients at University Hospital Bristol. This performance is economical for the paying and user customers, and in healthcare terms.

A service system is defined as an extended system that surrounds the offering, usually by other services in the organization. In social and healthcare sectors there are usually many parties involved in a service system, as in the Lauttasaari model and psychiatric service in Satakunta. Customer service is here categorized as a separate function from the core service. That is visible in Stockholm's Läns Landsting, which sends chlamydia tests to patients' homes.

A channel is defined as the way to connect the offering to the customers. The best innovation examples use electronic means, as in iDoc24 and the European Telemedicine Clinic. Another type of connecting is the early supported discharge of stroke patients at University Hospital Bristol, where the acute hospital team takes care of the patient throughout the recovery process, instead of sending him or her to another place for rehabilitation. The brand means how the benefits of the offering are presented to the customer. Good examples of this are iDoc24 and the European Telemedicine Clinic.

Customer experience entails how to create an overall experience for customers, i.e., beyond the product/service performance. In most cases this is not described, as the cases were in the planning phase. Good examples of customer experience are the SLL/chlamydia test with discretion and stroke patient care in Bristol. Many cases support the empowerment of the customer: the Royal National Hospital of Rheumatic Diseases features multiple channels for communicating with patients suffering from chronic fatigue syndrome. As one patient put it in the case, "I had help on my way back to work - telephone support was very good for a tricky situation." Passion for Life in Jönköping is a similar example of empowerment for aging people.

The business model indicates how the organization makes its money. In public organizations the objectives can be broader than just monetary gains. As an example is Fixarmalte och Fixarmärta, where formerly unemployed people help aging citizens with household errands. Another type of business model is the psychiatric care in Satakunta, where the ambition is to change the compensation to be based on realized cost savings in the care processes.

Finally, a value network refers to the organization structure and value chain. Satakunta Psychiatric Care is a case where the supplier is developing a service to capture the value. Another type of value network is software where the value is created by patients to each other, through crowdsourcing, e.g., Redasoft (with an emphasis on pain) and Patientslikeme.

Country comparison

In Sweden the cases were collected from the private, public, and third sector, some of which went abroad to seek out the best practices. In the UK all the cases were from the public sector. In Finland the cases represented the private and public sectors. The UK cases were structured descriptions defining long term conditions, priorities, cost savings, and benefits to the customer, with quantifiable results and transferability as some of the measured outcomes. With these requirements it could easily serve as a base for an innovation competition. Transferable services could be replicated or produced jointly as a national service.

Discussion

After analyzing these cases and categorized them in the Keeley's et al (2013) framework of service innovation we could suggest that a radical innovation could have following qualities. (1) It is usually focused on one disease, and the same organization handles it from beginning to end with better product/service performance (iDoc24, Stroke Discharge, From Coxa to Home). (2) It uses multiple channels to connect with the customer (care manager in Lauttasaari, contact channel in The Royal National Hospital of Rheumatic Diseases) (3) It offers information on the diseases (netdoctor.se), (4) offers a community with the same problem (Redasoft, Patientslikeme), and (5) supports user empowerment (exercise DVD for cardiac recovery/Gloucestershire, Passion for Life/Jönköping). (6) It uses electronic means as much as possible (iDoc24, SLL internetpsychiatry), and (7) combines these tools for a service system or value network. Finally, (8) it has ongoing discussions about what the customers want (the Lauttasaari model) and (9) is transferable to multiple locations (Praktikertjänst). The Internet of things model offers significant potential for electronic means of innovation in healthcare.

Suggested processes

The main implication for a joint procurement unit, in terms of public procurement for innovation, is that the cost of the innovation procurement project can be divided among several participants or it can be included in the annual compensation fee paid by the supplier. The compensation can also use profit-sharing (Kalvet and Lember, 2010). In this way, an innovation contract is easily accessible for public organizations. It also offers an effective channel for innovation diffusion for national innovation projects or innovations created elsewhere, thus promoting the growth of supplier enterprises. The potential is even larger if we can recognize catalytic properties in the innovation project, either in private sector organizations, organizations abroad, or among citizens. This was attempted with flexi-fuel cars in Stockholm (Kalvet and Lember, 2010).

The innovation sourcing projects related to the technological maturity of the procurement objects can be categorized into six different types:

- (1) Off-the-shelf innovations (materials, enabling technology). As Rolfstam et al. (2011) and Kivistö et al. (2014) demonstrate, there should be a way of creating access to these innovations, which may be new in other surroundings. In a four-year framework agreement or dynamic purchasing system there is time for early acceptors and those accepting later.
- (2) Developed service innovations to be used in several entities, such as iDoc. These represent lower ambition levels than pre-commercial procurement (PCP), but are likewise diffused to user organizations.
- (3) Pre-commercial procurement (PCP) projects, such as diabetes care or procurement for disabled housing services.
- (4) Radical PCP-projects, such as Satakunta, iDoc, and public transport planning software (Kalvet and Lember, 2010). These projects are more challenging, but the rewards are likely to be higher.
- (5) National service network projects, where the joint procurement unit organizes and sources a service nationally, such as Praktikertjänst. There are multiple functions within public entities where centralized or centrally coordinated services would be either better or more cost-efficient.
- (6) Innovation competitions based on broad ideas of what the customers are looking for. NHS innovation cases lean this direction, and the Marja-Vantaa case of service architecture was the

conceptual phase of it. This can be divided either into a two-stage model or a one-stage model, and also allows public organizations to use open sourcing or crowdsourcing. In the two-stage model there is a possibility that the innovation organization is a small enterprise or an individual person who cannot perform the actual production or supply phase.

Further research

This discussion about public procurement for innovation emphasizes the role of innovations in economic development. There is a need to categorize those economic impacts, whether in terms of productivity in public organizations or growth of (national) supplier organizations, or both. When there are no national growth companies, the procurement might look for the best suppliers internationally. A second theme for future work is raised by Kalvet and Lember (2010), who introduce different kinds of contractual terms. This corresponds to the Keeley categorization business models. There are risk concerns but also revenue, intellectual property rights, and incentive aspects. A third topic for future studies is organizational characteristics, which can enable or stop the diffusion of the innovations.

References

- Alvesson, M (2003): Beyond neopositivists, romantics, and localists: A reflexive approach to interviews in organizational research, *Academy of Management Review* 2003, Vol. 28 No 1, 13-33
- Arlbjørn JS, Freytag PV (2011): Public procurement vs private purchasing -Is there any foundation for comparing and learning across the sectors? , *International Journal of Public Sector Management* Vol. 25 No. 3, 2012 pp. 203-220
- Bloom, N, Sadun, R, Van Reenen, J, Americans Do IT Better: US Multinationals and the Productivity Miracle, *American Economic Review* 2012, 102(1): 167–201
- Brem, A, Voigt, K-I (2009), Integration of market pull and technology push in the corporate front end and innovation management—Insights from the German software industry, *Technovation* 29 (2009) 351–367
- Calantone, R, Vickery S. (2010), Introduction to the special topic forum: Using archival and secondary data sources in supply chain management, *Journal of Supply Chain Management*, Oct 2010; 46, 94-95
- Edler, J., Georghiou, L. (2007), Public procurement and innovation—Resurrecting the demand side, *Research Policy*, Vol. 36, pp.949–963
- Edquist, C (2009): Public Procurement for Innovation (PPI) – A pilot study, Centre for Innovation, Research and Competence in the Learning Economy (CIRCLE), Paper no 13/2009
- Kalvet, T, Lember, V (2010): Risk management in public procurement for innovation: the case of Nordic-Baltic Sea cities, *Innovation - The European Journal of Social Science Research* Vol. 23, No. 3, September 2010, 241-262
- Keeley, L., Walter, H., Pikkal, R., Quinn, B., (2013), *Ten Types of Innovation: The Discipline of Building Breakthroughs*, Wiley.

Luzzini, D, Ronchi, S (2011), Organizing the purchasing department for innovation, *Operations Management Research* (2011) 4:14–27

McAdam, R, A multi-level theory of innovation implementation Normative evaluation, legitimization and conflict, *European Journal of Innovation Management* Vol. 8 No. 3, (2005) pp. 373-388

Nijssen E, Hillebrand B, Vermeulen P, Kemp R. (2006), Exploring product and service innovation similarities and differences, *International Journal of Research in Marketing* 23 (2006) 241–251

Rolfstam, M, Phillips, W, Bakker E (2010): Public procurement of innovations, diffusion and endogenous institutions, *International Journal of Public Sector Management* Vol. 24 No. 5, 2011 pp. 452-468

Salge, T.O., Farchi, T., Barrett, M.I., and Dopson, S. (2013): When Does Search Openness Really Matter? A Contingency Study of Health-Care Innovation Projects, *Journal of Product Innovation Management* 2013;30(4):659–676

Schiele, H. (2010) Early supplier integration: the dual role of purchasing in new product development, *R&D Management*, Vol. 40, Issue 2, pp. 138-153

van Putten, M. (2012): Leading public innovation procurement, 5th International Public Procurement Conference; Portland

Yeow J, Edler, J (2012) Innovation Procurement as Projects, *Journal of Public Procurement*, Volume 12, Issue 4, 472- 504

Publication IV

Kivistö, T., de Boer, L. & Hallikas, J.
Monitoring Green Public Procurement

Working paper
24th Annual IPSERA Conference
Amsterdam 2015
© authors, 2015

Monitoring Green Public Procurement

Timo Kivistö^{ab}, Luitzen de Boer^c, Jukka Hallikas^d,

^a Timo Kivistö

Timo Kivisto Consulting Ltd

Ylistorma 5 E, FIN-02210 Espoo, Finland

*Tel. +358 9 8811749, e-mail: timo.kivisto@kivistoconsulting.fi *Corresponding author**

^{bd} *Lappeenranta University of Technology*

Department of Business Administration

P.O. Box 20, FIN-53851 Lappeenranta, Finland

^c *Norwegian University of Science and Technology*

Department of Industrial Economics and Technology Management

Alfred Getzveg 3, 7491 Trondheim, Norway

Working paper

Summary

The aim of this paper is to develop a monitoring system for Green Public Procurement. The monitoring system contains a maturity model for environmental procurement processes and requirements and a suggestion for an environmental marking for public framework agreements. Issues related to green public procurement are reported in a sustainability report. In the proposed monitoring system, we use (Global Reporting Initiative) the G4 reporting template as a base. The design of the monitoring system is based on empirical research conducted in five Nordic countries, encompassing various documents and interviews with state and regional procurement units, bodies using the contracts, suppliers, and stakeholders.

Keywords: sustainability, public procurement, maturity model

Background

The objective of this paper is to build a system for monitoring for green public procurement comprising a maturity model for green public procurement and an environmental marking compatible with CSR-reporting. There is a growing public interest in green procurement, which is evident in the number of articles published in this field (Lintukangas et al., 2013). “The lack of theoretical foundation and perspectives concerning green supply management” has also been indicated. Furthermore, there seems to be a widespread lack of comprehensive systems and approaches for monitoring the effectiveness of green public procurement policies and strategies, both on a national and European level.

Green public procurement (GPP) can be defined as green procurement by public organisations. There are various terms that express the same phenomenon (Lintukangas et al., 2013 p.2) such as ‘green supply management, environmental purchasing, responsible buying and sustainable supply chain management’. This variety of words for the meaning of procurement needs clarification.

Prier and McCue (2009) refer to the American Bar Association’s Model Code for Public Procurement, which defines public procurement as ‘buying, purchasing, renting, leasing or

otherwise acquiring any supplies, services or construction'. They also have a process view of 'description of requirements, selection and solicitation of sources, preparation and award of contract, and all phases of contract administration'.

van Weele (2005) divides the procurement process into two phases: tactical procurement and order function. Tactical procurement includes (1) determining specification, (2) selecting supplier, and (3) contracting. The order function includes (4) ordering; (5) expediting and evaluation, more precisely, monitoring and control of the order to secure supply; (6) follow-up and evaluation, more precisely, supplier rating and supplier ranking. van Weele's process recognizes the order function, whereas the American Bar Association's definition remains mainly on the tactical level.

Prier and McCue (2009) attempt to differentiate the processes of materials management and procurement, stating that inventory management and surplus management are materials management processes. Murray (2009) defines the term 'commissioning' to include the cycle of (a) a strategic needs assessment (for the people in an area), (b) deciding priorities and outcomes (c) planning and designing services, (d) options appraisal (e) sourcing, (f) delivery and (g) monitoring and review. The commissioning cycle interacts with the procurement in (e) and (1).

Bowen et al. (2001) express that green supply involves 'activities that are attempts to improve the environmental performance of purchased inputs or of the suppliers that provide them'. The article reveals two viewpoints of green supply, namely, the process view of 'supply management activities aimed at incorporating environmental considerations' and the product view that 'involves changes to the product supplied'.

Bouwer et al. (2005) analyse 21 different definitions of green public procurement and coin perhaps the most comprehensive definition: 'Green Public Procurement is the approach by which Public Authorities integrate environmental criteria into all stages of their procurement process, thus encouraging the spread of environmental technologies and the development of environmentally sound products, by seeking and choosing outcomes and solutions that have the least possible impact on the environment throughout their whole life-cycle'. The report recognised four building blocks for the definition: (1) greener products, (2) use of green technology, (3) greener functionality (outcome) rather than defined products, and (4) green procurement process. The report also separately discusses environmental technology and classifies it as a procurement outcome.

Green Public Procurement is defined by the European Commission (2008) in the following manner: 'A process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured'.

Environmental management systems are recognised as one of the criteria. ISO 14000 is a family of 15 standards (ISO, 2009) based on the environmental management system ISO 14001. The standard itself does not set requirements or criteria for the environmental level. In order to verify or claim environmental quality of the products there are standards or guidances to rely on. In ISO 14020, a series of standards addresses environmental labels and declarations. For verification purposes, there is ISO 14064 for greenhouse gases, ISO 14045 for eco-efficiency management, and ISO 14067 and ISO 14069 for the carbon footprint.

Green public procurement is related to the larger concept of sustainability. The European Commission has guidelines for social aspects: European Commission (2010) Sustainability

refers to corporate social responsibility. The main standards or guidelines which we have used are Global Reporting Initiative's (GRI) G4. Corporate social responsibility (CSR) has three categories of objectives: economic, environmental, and social. By choosing CSR-reporting, green impacts can be reported on the highest level.

The European Commission (2008) made a recommendation for developing EU GPP criteria. Since 2008, there over 20 sets of criteria have been developed that focus on the greatest environmental effects and the share of monetary volume of public procurement. These EU GPP criteria complement environmental systems in terms of required levels. The contents of the criteria are classified into two levels: the core criteria and the comprehensive criteria. The communication also emphasized monitoring GPP with (1) a quantitative indicator expressing the percentage of GPP in relation to all public procurement and (2) an impact-oriented indicator expressing the environmental and financial gains achieved by GPP.

PriceWaterhouseCoopers (2009) elaborated the indicators defined by the European Commission (2008). In addition to the quantitative indicators, they made calculations related to CO₂ emissions and cost impacts for public organisations, using both core and comprehensive criteria.

Another study was conducted for the European Commission by Renda et al (2012) to measure the uptake of green criteria in product categories having EU GPP criteria. The study was made a questionnaire that involved tender documents.

Despite these efforts at establishing criteria for measuring the effectiveness of green public procurement efforts, there seems little evidence of widespread monitoring in practice. This paper is intended as a contribution to improve this situation, in particularly by outlining a maturity model of green public procurement.

The purchasing maturity framework is applied in this study to identify different stages of development in sustainable purchasing. Lintukangas et al. (2013) indicate that the high level of supplier relationship management capability (in firms) increases the adoption of green supply management. Maturity models have been conventionally used in purchasing to enable the measurement of the level of development in various areas of purchasing (Schiele, 2007). Heikkilä et al. (2014) summarize different maturity models for purchasing and classified them into two categories: building models and testing models. A maturity model describes auditable stages which an organization is expected to undergo in its quest for greater sophistication (Schiele, 2007). Carter et al. 2005 consider procurement maturity from the viewpoint of performance measurement and identify four different maturity levels (poor, average, good and world class). The issues reported were capabilities concerning the measurement system.

Harland et al. (2013) present a maturity framework of public procurement development in relation to government policy objectives such as innovation, employment, and sustainability. The maturity model has seven stages: (1) sourcing and delivering goods and services, (2) compliance of legislation/regulation, (3) efficient use of public funds, (4) accountability, (5) value for money, (6) support of broader government policy objectives, and (7) delivery of broader government policy objectives. Bouwer et al. (2005) described the requirements for a category maturity model. This view categorized tender documents into four classes: (1) not green, (2) grey, which indicates that attempts to be green were found, (3) light green, indicating that there were one to three clear specifications, and (4) solid green, indicating that there were more than three clear specifications.

The paper is organized as follows. First, we briefly summarize some key results of the empirical study that forms the basis for our work. Next, we sketch the main idea for our maturity model for green public procurement and how it could be turned into a practical monitoring system. We close the paper with a discussion and conclusions.

Empirical study

The Nordic Council of Ministers (NCM) assigned this research group to investigate green state framework agreements. The aim of the project was to describe GPP practice in terms of state framework agreements in Nordic countries, propose country-specific ways to improve the situation, and draw a general model of efficient ways to improve the situation.

The interviewees were to be from state governing bodies, the state procurement unit, user organisations of framework agreements, advisory bodies, suppliers, and national enterprise organisations. The governing bodies included the supervising body for the procurement unit, as well as legal and environmental bodies. There was a total of 65 interviewees. In addition to interviews, samples of good and bad tender documents were collected.

After individual country reports were compiled, it was recognized that the Finnish way of having a green marking for framework agreements is considered one of the best practices. On the other hand, this marking is derived from legal methods of implementing green values instead of environmental impacts. The method corresponds with the methodology created in Bouwer et al. (2005). In Norway, they have a third party system in which eco-labelled products can be registered.

Based on the interviews, it is evident that there are environmental aspects which the suppliers can provide but that are not used by procurement units. One of the examples is reporting CO₂ emissions. The other comment from suppliers was that the procurement unit did not verify the information given in the tender documents.

Some suppliers claimed that the procurement units had very little green criteria. One of the bad tender documents analysed two successive competitions of short-term car leases. In the former competition, the supplier could obtain award credits of 4% from the share of vehicles that satisfied the criteria of having CO₂ emissions of under 140 g/km. In the latter competition, the vehicles were classified into size groups, which had the maximum requirements for CO₂ emissions. In this case, the supplier had the perception that the procurement unit had no green criteria. The same phenomenon is found in Michelsen and de Boer (2009).

The country reports for Denmark, Finland, Iceland, and Norway showed a variety of objectives, specifically the balancing between cost and green functionality, and the availability from local suppliers and green functionality. In one of the good cases, two successive furniture tender documents were analysed. In the earlier competition, the tender was divided into normal and eco furniture due to lack of competition. Phasing the situation, the procurement unit stated that in the following competition there will only be green requirements. The latter competition had four acceptable suppliers, all of which obtained framework agreements. This case reveals not only a supplier development aspect in procurement processes but also a way of commercially procuring maximum green requirements. The tender documents name over 20 substances which should not be in the products. The requirements are derived from EU GPP criteria. This example shows that the classification by Bouwer et al. (2005) is not sufficient. Some of the procurement units have CSR reporting, and green public procurement is reported as an issue within the CSR-report.

In the interviews with procurement units, it was also stated that for some procurement categories it is difficult to determine criteria because they have marginal green aspects. These categories were mainly non-material intensive services. The same was concluded in Bouwer et al. (2006). On the other hand, the government policy necessitates that green aspects are taken into account in all procurement. Interviews with suppliers also stated that there is room for development in terms of how requirements are defined.

Developing a maturity model

In the following table, we present a preliminary green public procurement maturity model. This is an overall model for a procurement organization. According to Bouwer (2005), one of the main building blocks is the green procurement process. This includes the commissioning, tactical procurement, and ordering function. In the commissioning, there is the possibility of considering greener functionality or, in other words, adopting a cross-category approach. Tactical procurement is divided according to the specification by van Weele (2005), and green requirements are a part of the specification. Selecting a supplier in the GPP process implies that there are supplier evaluation criteria as compulsory requirements or as award criteria. A supplier audit can also be a part of the process. Contracting includes the actual contract and green contract terms. In the ordering function, the procurers should be able to make green product choices among all products.

Many of the green effects come from specifications, the other building block given by Bouwer et al. (2005). Both EU GPP criteria and environmental labels are based on scientific research and life cycle assessment (Fet et al., 2011). These processes involve considerable costs and therefore the procurement units are advised to follow these criteria. We selected these instead of the classification by Bouwer et al., because EU GPP criteria are based on suggestions by the same source. In some cases, they also provide specifications for suppliers' processes, thereby causing marginal impact of supplier selection.

The two remaining building blocks given by Bouwer et al. (2005) are greener functionality and use of green technology. Greener functionality is expressed as a focus on the impact and cross category approach. One of the examples of this is replacing travelling with videoconferencing. The use of green technology is a necessity for improving green impacts but also a part of innovation policy supported by the European Commission. Table 1 illustrates the framework of the maturity model for green public procurement.

	Passive	Basic	Medium	Advanced	Strategic
Green business plan /Commissioning	no	some green development	max green commercially	focus on impact, cross category approach	long term development plan
Specification (EU GPP or env label exist)	no	some core criteria	core criteria	comprehensive criteria	beyond comprehensive
Specification (no EU GPP or env label)	no	no	requirements to main impacts	requirements to main impacts	requirements to main impacts
Supplier selection and contracting	no	suppliers env plan		supplier audit	
Buying green products	no	no data for choosing green products		green product choices	
Monitoring	no	ad hoc	green agreement marking	supplier reporting	supplier reporting of emissions, CO ₂
Innovation/Use of green technology	no	ad hoc		use of green innovations	precommercial trials for green

Table 1: Maturity model for green public procurement (further developed from Bouwer et al (2005))

Monitoring is raised as a separate issue (see European Commission, 2008; European Commission, 2011; PriceWaterhouseCoopers, 2009; and Renda et al., 2012). The green marking of framework agreements, one of the monitoring elements, is regarded as one of the best practices in the empirical study. In the next section we outline how the assessment of maturity may be achieved by connecting it to standard environmental reporting systems.

Turning the maturity model into a monitoring system

The basis for the monitoring system is CSR reporting, because these reports are more common than mere environmental reports. In this area, there are two widely accepted guidelines: G4 sustainability reporting guidelines and standard ISO 26000: 2010 guidelines for social responsibility. The Global Reporting Initiative by Searcy and Buslovich (2014) is the most prominent. According to Albareda (2013), both these both guidelines compete and cooperate with each other at the same time. For monitoring purposes, we use G4 guidelines as a basis.

Searcy and Buslovich (2014) describe the methods for producing sustainability reports. Most of the respondents partially or fully used standard guidelines. One of the challenges was retrieving the data to present it in the report; this also included data from suppliers. The compilation of the reports was varied in different companies, so there was no exact method for creating a sustainability report. This implies that there was freedom in terms of creating documentation of green agreements. Searcy and Buslovich also explored how the reports were used. One of the main uses was communication to external stakeholders and internally for employees.

G4 guidelines can be divided into management approach and disclosures on management approach (DMA). The DMA has three categories: environmental, social, and economic. Each of these categories are then further broken down into aspects and then into individual codes. The report is supposed to express measures on issues that are regarded as significant by stakeholders. The DMA can either be specific or generic. The latter implies that one document can refer to several aspects.

For reporting purposes, the procurement unit may use a generic document of green agreements or specify each code separately. Alternatively, the green agreement marking may reveal G4 codes in it. Hansel (2014) provides this as a generic document. As shown in table 2, the level of details can be enhanced, but the overall scope should be the state government.

Aspect	G4 Code	Description
Emissions	G4-EN15	Direct greenhouse gas emissions (scope 1)
	G4-EN16	Energy indirect greenhouse gas emissions (scope 2)
	G4-EN17	Other indirect greenhouse gas emissions (scope 3)
	G4-EN18	Greenhouse gas emissions intensity
	G4-EN19	Reduction of greenhouse gas emissions
	G4-EN20	Emissions of ozone-depleting substances
	G4-EN21	NO _x , SO _x and other significant air emissions

Table 2 Sample of G4 environmental categories

Discussion and Conclusion

Many existing studies have analysed tender documents. In this paper, we attempted to create a reporting system for procurement units both for green agreements and supplier reporting. A good reporting template would include the elements of the maturity model and the impacts required by the G4 reporting template.

The sustainability report is a large undertaking, so procurement units are advised to restrict to producing the DMAs concerning procurement. Procurement documents can be used to communicate sustainability issues to suppliers. The interviews revealed that the suppliers do not recognize these issues. The same was reported by Michelsen and de Boer (2009).

Further, the green agreement marking can be incorporated in the G4 reporting. On the governmental level, procurement units could serve as GPP reporting facilitators collecting relevant information from the suppliers and transforming the data for each internal customer. The alternative could be to use a third party for reporting purposes.

In this study, we concentrated on state framework agreements, which are directly used products or services. Another investigation must be made for GPP in construction, where the procurement units cannot determine requirements for individual materials or equipment. The requirements are determined by consultants or construction companies. Green technology in its final or development phases can also be used as requirements.

References

Albareda, L., 2013. CSR governance innovation: Standard competition-collaboration dynamic. *Corporate Governance* 13 (5), 551-568

American Bar Association (2000): The 2000 Model Procurement Code for State and Local Government.

Bouwer, M., de Jong, K., Jonk, M., Berman, T., Bersani, R., Lusser, H., Nissinen, A., Parikka, K., and Szuppinger, P., 2005. Green public procurement in Europe 2005—Status overview. *Virage Milieu & Management* 2011. AJ Haarlem, The Netherlands. Available from: <http://europa.eu.int/comm/environment/gpp/media.htm#state>

Bouwer, M., Jonk, M., Berman, T., Bersani, R., Lusser, H., Nappa, V., Nissinen, A., Parikka, K., Szuppinger, P., Viganò, C., 2006. Green public procurement in Europe 2006—conclusions and recommendations. In: K. Spaarne (Ed.). *Virage Milieu & Management*. AJ Haarlem, The Netherlands. Available from: http://ec.europa.eu/environment/gpp/pdf/take_5.pdf

Bowen, F., Cousins, P., Lamming, R., Faruk, A., 2001. The role of supply management capabilities in green supply. *Production and Operations Management*, Summer 2001, 10 (2), 174

Carter, P., Monczka, R., Mosconi, T., 2005. Strategic Performance Measurement for Purchasing and Supply, Center of Advanced Purchasing Studies.

European Commission, 2008. Public Procurement for a Better Environment, European Commission COM (2008) 400.

European Commission, 2010. Buying Social: A Guide to Taking Account of Social Considerations in Public Procurement, European Commission.

European Commission, 2011. Buying Green: A Handbook on Green Public Procurement, Second edition, European Commission

Fet, A., Michelsen, O., de Boer, L. 2011. Green public procurement in practice—The case of Norway. *Society and Economy* 33 (1), 183-198.

Global Reporting Initiative: G4 Sustainability Reporting Guidelines, Reporting Principles and Standard Disclosures. www.globalreporting.org

Hansel, 2014. Sustainability Report 2013, <http://annualreport2013.hansel.fi/?id=7>

Harland, C., Telgen, J., Callender, G., 2013. International research study of public procurement. In: C. Harland, G. Nassimbeni, and E. Schneller (Eds.). *The Sage Handbook of Strategic Supply Management*. Sage, London. pp. 374-401

Heikkilä, J., Koivisto, A., Ojala, M., 2014. In Search of Purchasing Maturity—Literature Review and Future Implications, IPSERA 2014 Conference, South Africa.

International Standardization Organisation, 2009. *Environmental Management: The ISO 14000 family of International Standards*, ISO Central Secretariat; Geneva

Lintukangas, K., Hallikas, J., Kähkönen, A-K. 2013. The Role of Green Supply Management in the Development of Sustainable Supply Chain, Corporate Social Responsibility and Environmental Management. wileyonlinelibrary.com

Michelsen O., de Boer, L., 2009. Green procurement in Norway: A survey on practices on the municipal and county level. *Journal of Environmental Management* 91, 160-167.

Murray, G., 2009. Towards a common understanding of the differences between purchasing, procurement and commissioning in the UK public sector. *Journal of Purchasing & Supply Management* 15, 198-202.

PriceWaterhouseCoopers, 2009. Collection of statistical information on Green Public Procurement in the EU.

Prier, E., McCue, C., 2009. The implications of a muddled definition of public procurement. *Journal of Public Procurement* 9 (3/4), 326-370.

Renda, A., Pelkmans, J., Egenhofer, C., Schrefler, L., Luchetta, G., Selçuki, C., Ballesteros, J., Zirnhelt, A-C., 2012. The uptake of green public procurement in the EU27, Center for European Policy Studies and College of Europe, Brussels

Schiele, H., 2007. Supply-management maturity, cost savings and purchasing absorptive capacity: Testing the procurement–performance link. *Journal of Purchasing & Supply Management* 13 (4), 274-293.

Searcy, C., Buslovich, R., 2014. Corporate perspectives on the development and use of sustainability reports. *Journal of Business Ethics* May 2014 121 (2), 149-169.

van Weele, A., 2005. *Purchasing & Supply Chain Management, Analysis, Strategy, Planning and Practice*. Thomson Learning, London.

Publication V

Kivistö, T. & Virolainen, V.M.

**Analyzing local and SME participation in public procurement – evidence from seven
Finnish municipalities**

Reprinted with permission from

In Thai(ed): Global Public Procurement Theories and Practices

p. 83-97

© 2017, Springer International Publishing

ANALYZING LOCAL AND SME PARTICIPATION IN PUBLIC PROCUREMENT – EVIDENCE FROM SEVEN FINNISH MUNICIPALITIES

Timo Kivistö and Veli Matti Virolainen*

ABSTRACT. Employment and local business participation are important values for municipalities. Government policies raise the issue of small and medium-sized enterprise (SME) participation in public procurement. Existing research uses normal procurement notices, which fail to consider the procurement of under threshold values and the procurement falling outside directives. In this paper the data used is based on invoice data covering all procurement transactions. The analysis shows that public organizations make up a large share of the procurement volume, and the SME share of procurement is equal to the share of SMEs in Gross National Product. Local content is greatly affected by the location of social and healthcare providers and the distance from and size difference with a larger municipality. The greatest employment effects are in social and healthcare and construction. We make classification, calculations and analyze the data with Gioia method. The local and total employment and tax revenue are calculated from the procurement volume.

INTRODUCTION

The procurement volume of municipalities and their subsidiaries comprises the majority of the public procurement in Finland, corresponding to 32 billion euro of a total of 52 billion euro (Kivistö & Virolainen, 2015). Joint municipalities account for 6 billion euro of this total. Compared with other countries, Finnish public organizations are very municipality centered.

Government policies raise the issue of small and medium-sized enterprise (SME) participation in public procurement. In the local government level employment and local business participation are important values.

Timo Kivistö, MSc (Eng), is a consultant working with public procurement. He is also doctoral student at Lappeenranta University of Technology, School of Business and Management. His research interest is public procurement. Veli Matti Virolainen, DrSc (Tech), is a professor of supply management at Lappeenranta University of Technology, School of Business and Management. His research interest is supply strategy, value networks and public procurement.

Existing research rely mostly on the monetary volume of the procurement notices, leaving out the procurement under the

threshold values and the volume procured from in-house entities. Using invoice data in this research reveal the missing parts.

LITERATURE REVIEW

The monetary definition of procurement is anything that creates an invoice. Prier and McCue (2009) refer to the American Bar Association's Model Code for Public Procurement, which defines public procurement as "buying, purchasing, renting leasing or otherwise acquiring any supplies, services or construction."

One of the objectives in the new public procurement directive 2014/24/EU (European Commission, 2014) is "facilitating in particular the participation of small and medium-sized enterprises (SMEs) in public procurement." The Ministry of Economy and Employment ordered a report on SME perceptions of present public procurement for use in deciding on the national legislation (TEM, 2014). The main conclusions were that the public market is interesting for enterprises of all sizes, the majority of SMEs are well equipped with electronic means, and they welcome easy procurement procedures, small contract values, and publishing business opportunities for procurement under threshold values. In Finland, there is a national threshold value of euro 30,000 for supplies and services, which is proposed to increase to euro 60,000 in the new national legislation based on the directive above.

On the other hand, the same directive states that "Contracting authorities shall treat economic operators equally and without discrimination and shall act in a transparent and proportionate manner" (Chapter III, article 18). According to this principle, local enterprises should not be favored in procurement above the threshold values. Local employment is, however, an important political goal in municipalities. Many municipalities have stated that they are a good place for an enterprise. Some municipalities have small procurement systems in use, publishing under threshold business opportunities to local suppliers.

PWC (2014) estimates that in EU-27 countries, SME access to public procurement is 27% below the share of the national economy. In Finland, PWC used the SME share from the state procurement unit Hansel, which corresponds to 1.6% of the national procurement volume. From this figure, it is not possible to draw conclusions.

Kidalov and Snider (2011) analyzed small business policy in the United States and the European Union. They found several aspects of public procurement policies. One of the differences in the policies are the size caps: The European Union has one cap in

all industries, whereas the United States has individual caps considering both the sizes and competition environment in different industries. In the United States, there are also certain procurement programs for innovation targeted at SMEs. Kidalov and Snider concluded that SME access to public procurement is still an overall policy but without exact procedures.

Nicholas and Fruhmann (2014) questioned the existence of SME policies, indicating that the SME policies are fuzzy, and the policies treat SMEs as one group. They also concluded that political goals will dominate economic motivations. One of the aspects in SME policies is the economic benefits to local communities from local sourcing (NERA, 2005).

The existing literature focuses on SME access to (PWC, 2014; Kornecki, 2011) and perceptions of and experiences with public procurement (Karjalainen & Kemppainen, 2008; Loader, 2015; Loader & Norton, 2015; Flynn & Davis, 2015). Marketing and tendering behaviors were analyzed by McKeivitt and Davis (2013), market orientation was reviewed by Tammi et al. (2014), and SME participation in tendering was examined by Flynn et al. (2015). SME success in tendering was studied by Stake (2014). Loader (2011) created a survey on SME policies in local governments in the UK; and Nijaki and Worrel (2012) reviewed local procurement policies in an archival research study in the United States.

Sustainability includes buying locally, but many other issues affect local communities. Brammer and Walker (2011) performed a large survey on sustainable procurement, and local and SME procurement were found to be two of the most significant factors of sustainability across all continents. Other studies on sustainability aspects include those by Walker and Preuss (2008), Nijaki and Worrel (2012), and Lehtinen (2012) on food sustainability.

Local procurement was investigated by Qiao, Thai, and Cummings (2013) and Williams (2014) and under spatiality terms by Cabras (2011) and Mamavi, Nagati, Wehrle, and Pache (2014). Qiao, Thai, and Cummings (2013) reviewed all kinds of preferential programs, and they found that local procurement in most programs, but they found that many respondents felt that preference programs violate free competition and may cause higher prices and make purchasers' work difficult. The authors suggested further research on gains, costs, success rates, monitoring, and alternative solutions. Williams (2014) investigated local preference in one municipality environment and recommended an evaluation of whether the preferential treatment results in a beneficiary outcome or not. Mamavi et al. (2014) found that there is a correlation between construction

work and more local suppliers, whereas the opposite is true in goods and services. Cabras (2011) analyzed the procurement volume of one county in the UK, mapping the spatial distribution of procurement volume. He found that social services and construction have the greatest procurement volumes, and specialized consulting and other specialized services concentrated in the Greater London area. He also analyzed the dynamic effects of procurement by surveying suppliers about their first tier subcontractors.

Brulhart and Trionfetti (2003) studied the effects of public procurement on enterprises on a cross-national level and found that in a perfect competition environment, there is an insignificant impact on national suppliers, whereas if the country is a major public user of certain products, it will enhance the enterprise sector. The same kind of dynamic outcomes was searched by Cabras (2011) on a regional level.

Erridge (2007) analyzed the employment of the unemployed as an additional requirement for suppliers. The results showed that this was realized with marginal or no additional cost.

The majority of the available studies comprise surveys either of SMEs or public entities and qualitative papers on policy matters. Stake (2014) in his research used mathematic models.

Public procurement data are generally from procurement notices (Kornecki, 2011; Mamavi et al., 2011; PWC, 2014). Stake (2014) did not specify the data source used, but it is likely to be competition results from eTendering software. If the data source is procurement notices, the research is focused on tenders over the EU threshold values (euro 209,000 or higher), unless the national legislation requires notices under EU threshold values or the public entity voluntarily puts a notice under threshold value.

In our paper, we analyze municipalities' invoice data, which covers 100% of the procurement value. Apart from procurement over threshold values, it also covers the procurement under threshold values, and from other public entities, as well as procurement that falls outside the procurement directives. For a detailed analysis, see Kivistö and Virolainen (2015). Using the data of seven municipalities, we analyze distribution according to different supplier types and share of local procurement and create a calculation method for employment and local tax revenue.

The scientific contribution of this paper is a broader view of public procurement by using invoice data instead of public procurement notices. The broader data raises the supplier role of other public entities. It also has its effects on SMEs and local

procurement. Managerial contributions will be the local procurement potential and the effects on sustainability reporting.

METHODS

The data used in this study are secondary data from accounts payable or from accounting of the municipality. The reliability of the data is ensured by the fact that organizations must provide an official annual report containing profit and loss accounting and a balance sheet. The classification of invoices to different accounts is likely to be made according to the recommendation by Heinonen (2012). In principle, we should have 100% of invoices and procurement volume of all suppliers.

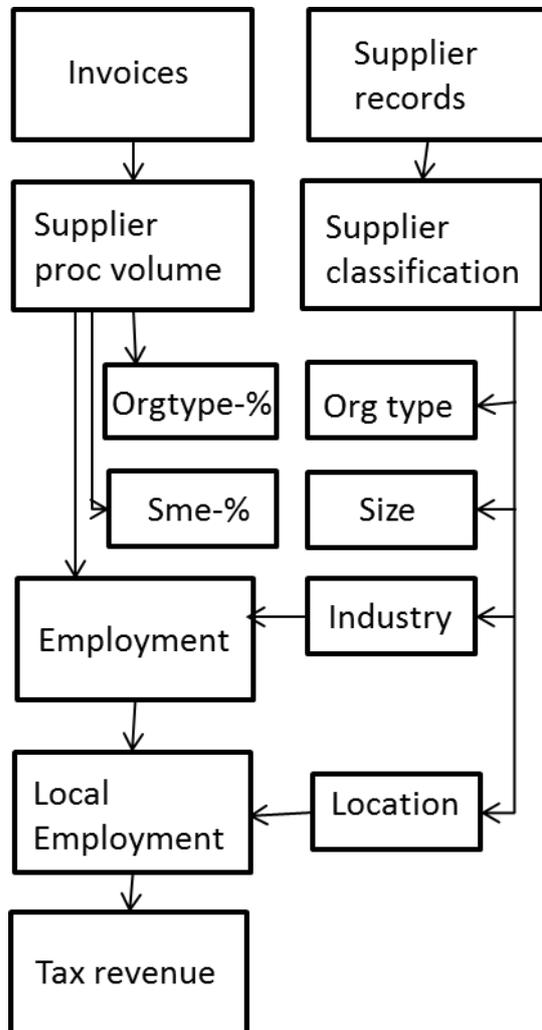
Any possible inaccuracies in the data come from the system the data is from: invoice handling systems may have parallel systems for confidential invoices, in-house organizations may have simplified routines, and payments can be made through clearing accounts or in cash. There is a possibility that the person delivering the data has not read the data delivery instructions and delivered either too much or too little data. A major part of these inaccuracies was encountered by comparing the figures from the annual report to the aggregated data. There may also be classification errors regarding which year and which account the data belongs. The possible errors might come from decentralized invoice handling, which may involve someone unfamiliar with the recommendation of accounts. Connecting supplier data to invoices may cause incompatibility errors. However, these are minor problems.

The invoice data were connected to suppliers and their addresses to determine the location of the supplier. The location information of the major suppliers was checked using company webpages to determine whether they were located in the municipality. Usually, the invoicing address was the company's headquarters. Companies' postal numbers were also reclassified to a municipality. The judgement used to classify an enterprise as local was based on the type of business. Construction, catering, and cleaning were classified as local, whereas local financial and insurance services were classified to headquarters.

Suppliers were classified into public, third sector, and big, medium, and small enterprises according to EU rules. The turnover of the companies was retrieved from a credit information company.

Figure 1

The calculation process



In the first case, local employment was calculated on a regional level. In four subsequent cases, it was calculated on the municipality level. In the two last cases, it was calculated on a consolidated municipality level, focusing on external suppliers and thus eliminating the volume by in-house suppliers.

The analysis of the data itself and the calculation results was done using the Gioia method (Gioia et al., 2013). This method is normally used with qualitative archives, but we use it here for

numeric calculation results based on invoice data (archival data). The Gioia method is especially well suited to exploratory research.

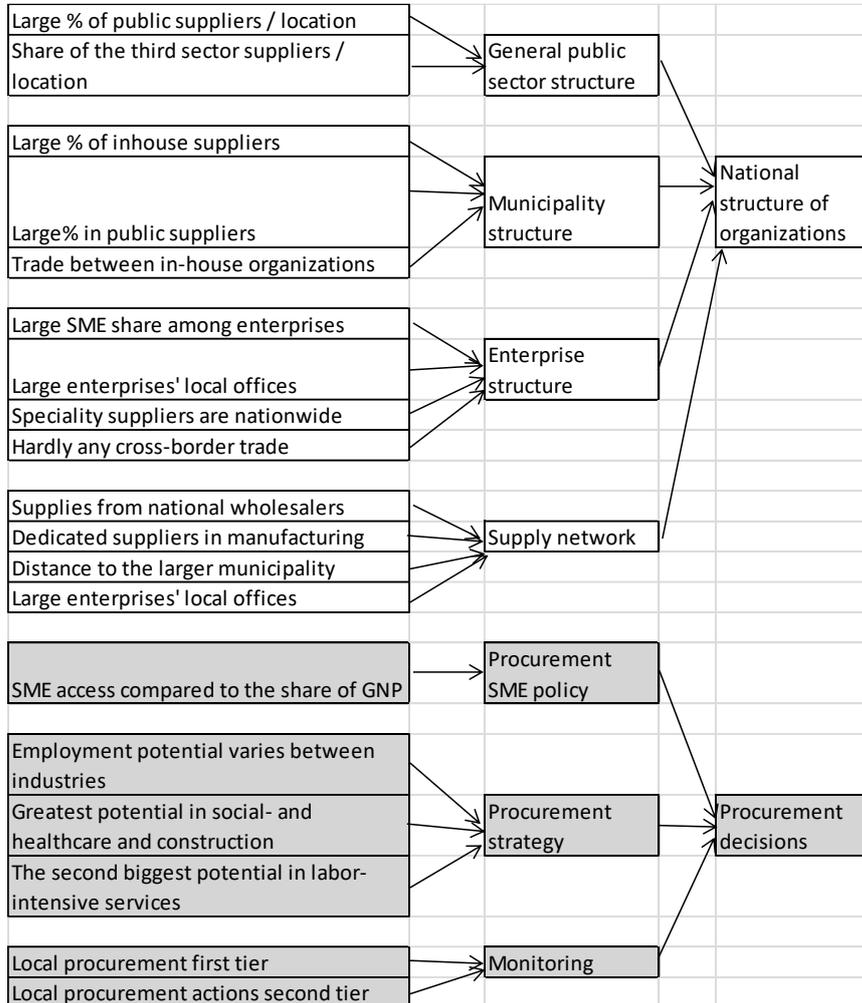
RESULTS

The cases are from seven municipalities from different parts of Finland. Espoo is the second largest municipality and is situated in the Helsinki metropolitan area. The metropolitan area is characterized with rich employment possibilities. Rauma is the second largest municipality in the Satakunta region and is situated 50 km south of Pori, which has double the population of Rauma. Kokkola is the largest municipality within 120 km. Porvoo is 50 km from Helsinki; Sastamala is 50 km from Tampere, which is the center of the second largest region in Finland; and Lappeenranta is largest municipality within 85 km, and Imatra is 40 km away from Lappeenranta. Table 1 shows the data source difference between measuring procurement notices and invoice data. In addition, a number of procurement notices did not show any value.

TABLE 1
Procurement Volume from Non-Public Suppliers

	EU	National	Under
Espoo	405 637 373	56 007 034	21 213 502
Rauma	39 275 523	20 738 731	8 310 330
Kokkola	110 026 677	23 229 161	11 020 371
Porvoo	53 667 184	22 469 830	10 607 317
Sastamala	13 733 356	12 999 692	5 795 566
Lappeenranta	32 582 560	12 304 059	7 115 199
Imatra	22 311 305	10 292 640	6 410 245
Data capture	Notices	Beyond notices	

FIGURE 2
Data Structure



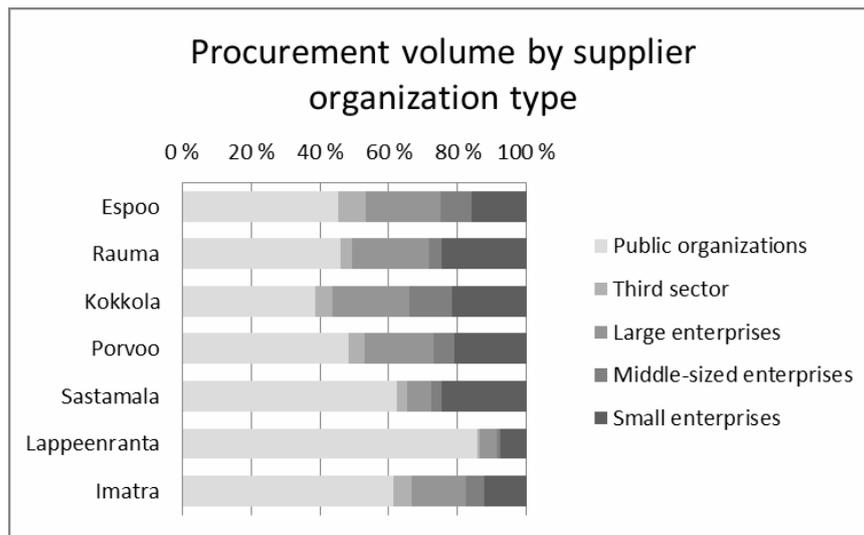
The results are described using the data structure of Gioia. On the left, there are the first order concepts, in the middle are the second order themes, and on the right are the aggregate dimensions. Using these dimensions, we are able to look at procurement from SMEs and local suppliers.

A large share of the public suppliers is due to the legislation. The Finnish public organization structure is very municipality centered. Every municipality has to be a member of a hospital district, a joint municipality for the care of disabled people, and a regional council. The membership means that the municipality procures the services from these organizations. The location of the central hospital greatly affects the share of local procurement.

The second indication of the general public sector structure is the size of the third sector. The state monopoly, the Slot Machine Association, is governed by law and funds projects by third sector associations.

The effect of the general public sector structure is shown in Figure 3. It shows the distribution of procurement by supplier organization type, revealing that public suppliers account for half of the procurement volume.

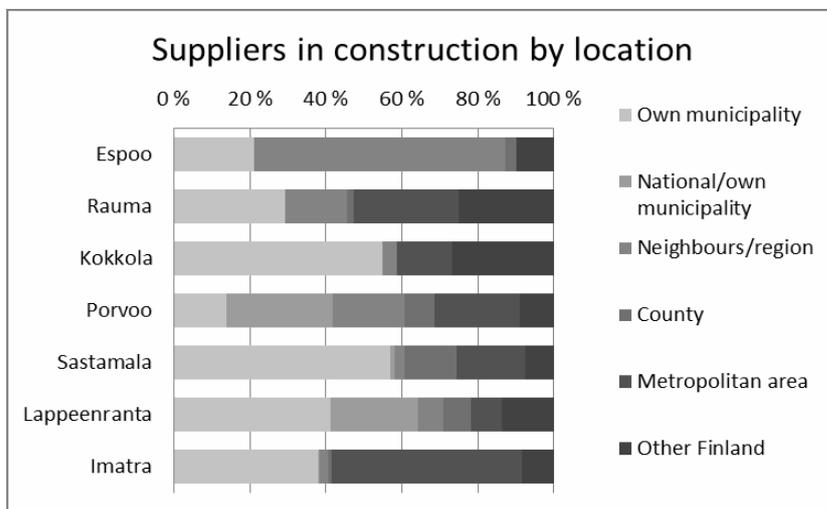
FIGURE 3
Procurement Volume by Supplier Organization Type



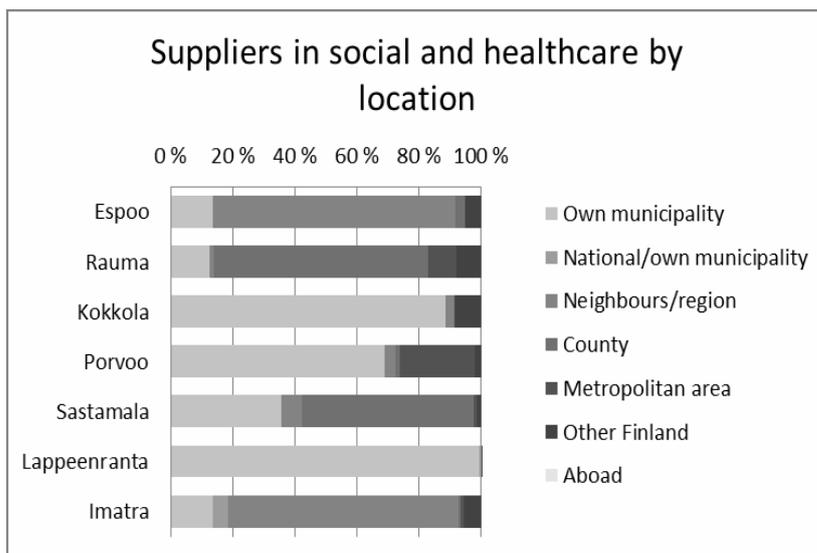
In addition to the general public sector structure, there are in-house organizations made by local decisions. These are partly enforced by recent legislation to form limited enterprises from the municipality units that produce services for the market.

The municipality structure effects are presented in Figure 4. There are structural differences between the municipalities concerning subsidiaries in energy production and distribution: Kokkola has in municipal limits; Rauma, Porvoo, and

**FIGURE 5
Procurement Volume by Location**



**FIGURE 6
Social Services and Healthcare Suppliers by Location**



Lappeenranta has the largest share of procurement volume in the municipality due to the large share of public suppliers—both joint municipalities and in-house subsidiaries—located in Lappeenranta. The percentage is high because Lappeenranta procures social services and healthcare, not just specialized healthcare like the other municipalities. On the other end is

Espoo, with a procurement volume of less than 20% from Espoo suppliers. One of the explanations is again social services and healthcare, the operation of which cannot be divided between Espoo and Helsinki. Originally, the analysis of Espoo was made at the regional level, showing a high percentage.

One interesting comparison is between Rauma (20%) and Kokkola (70%), where the population, the number of enterprise locations, and the number of personnel in the enterprises are at a similar level. Rauma has had a procurement organization for two decades, and Kokkola has had a procurement manager for three years. Kokkola has also merged with neighboring municipalities in the past four years. Both municipalities have started communicating with local enterprises. The best explanation for the local supplier share is the location of the central hospital; Rauma procures healthcare from Pori and for Kokkola the central hospital is in Kokkola. In addition, there are several other social services produced in the Pori area, whereas Kokkola is the major location for other social services. This situation is shown in Figure 6. One of the explanations for the difference is that Kokkola is an overall better location to make business. Rauma suffers from its proximity to Pori (50 km), whereas any municipalities that are larger than Kokkola are more than 120 km away. This situation can be seen in Figure 6 and in Figure 8.

The trade between in-house organizations is clearly seen in the analysis of Lappeenranta. For Lappeenranta (Lpr) and Imatra, the analyses looked at external procurement. Looking at the consolidated information from Lappeenranta, the municipality has several organizations in its consolidated annual report. The procurement volume was collected from seven different financial systems and 23 out of 28 organizations. The remaining five organizations had a different ledger, and they were small. One (an energy producing company) was majority owned by a large company and therefore classified as a supplier. The share of in-house procurement is seen in Table 2.

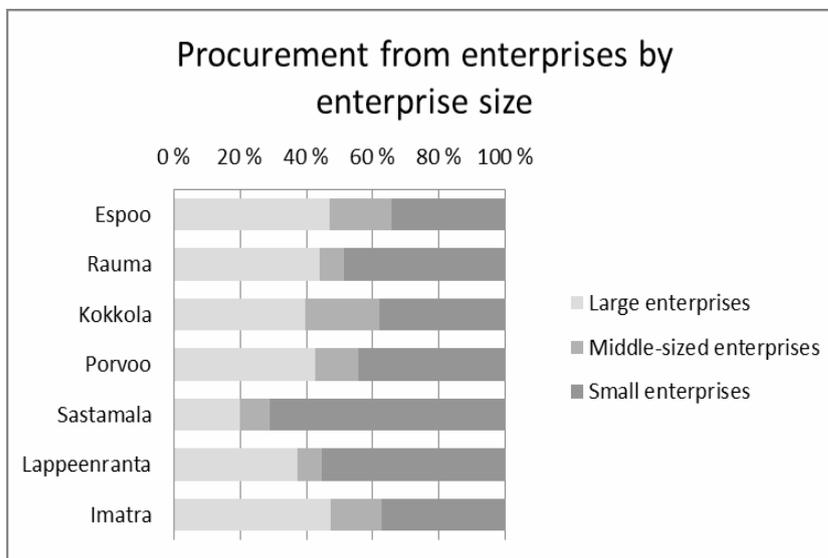
TABLE 2
Lappeenranta Procurement Volumes

Organization	Subsidiaries (whole /part)	In-house procure- ment	External procure- ment
Lappeenranta (itself)		270	46
Lpr Housing Services Ltd	4/0	8	10

Lpr Energy Ltd	3/1	33	40
Lpr Business Ltd	11/0	2	17
Saimaa Support services etc	0/2	2	10
South Carelian Waste Ltd	0/1	769	10
Saimaa Univ of Applied	0/1	379	5
Partly owned organizations	0/5	2	4
Joint municipalities	0/4	2	13
Lappeenranta (consolidated)		323	158

Figure 7 shows the share of SMEs in the procurement volume. The greatest percentage occurs in Sastamala (80%) and the smallest in Espoo and Imatra (ca. 55%). The enterprise structure in Sastamala mirrors the share of procurement from SMEs.

FIGURE 7
Procurement from Enterprises by Size



To determine what the equal share of SME access would be, we used the municipal procurement statistics and calculated the share of SMEs for every industry. The differences between industries are large, ranging from 37% in the manufacturing industry to 84% in professional services. The calculation shows that the share of SMEs should be 61%.

The municipalities buy supplies from wholesalers, either national or regional. In Rauma, a successful stationary wholesaler has a great proportion of the sales from the municipality, whereas the cleaning products supplier is not successful and the procurement volume is directed to Pori. Lappeenranta has a

regional supplier of cleaning products. Most of the municipalities do not have a regional supplier of foodstuffs, which is one of the aspirations of local politicians. In the construction industry Porvoo and Lappeenranta are chosen by the largest enterprises as good places to have an office.

FIGURE 8
Suppliers in Construction by Location

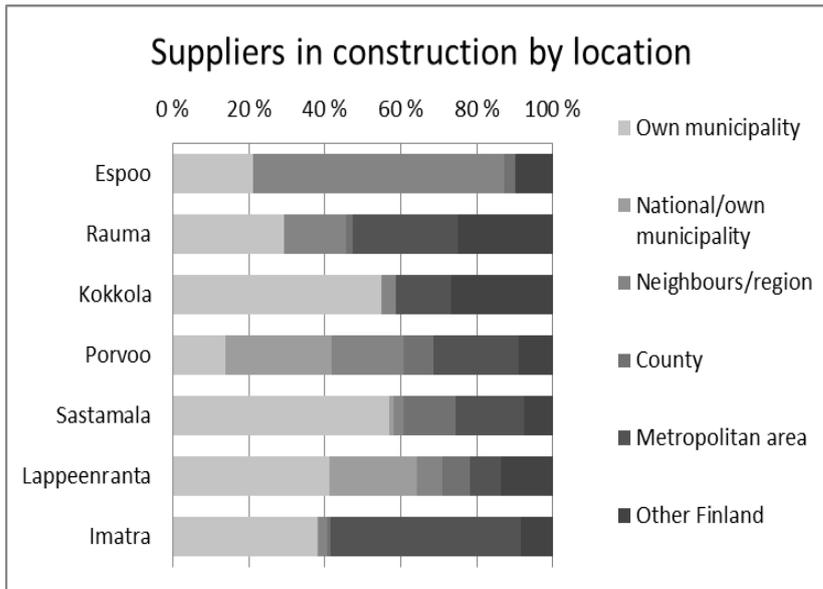


TABLE 3
Sastamala Public Procurement Effects on Local Employment and Municipality Tax

TOL 2008	Turnover/ employee	Salaries / employee	Proc vol local	FTE local	mun tax 1000 euro
C Manufacturing	428,60	43 566	65 960	0,2	1,14
D Electricity, gas, steam supply etc	1 093,00	49 067	947 673	0,9	7,33
E Water supply etc	335,10	34 691	17 186	0,1	0,29
F Construction	181,10	34 631	5 368 320	29,6	168,68
G Wholesale, retail trade	482,60	33 895	875 830	1,8	10,07
H Transportation and storage	176,20	34 672	2 918 972	16,6	94,40
I Accomodation and food service	103,70	23 738	4 731 471	45,6	164,28
J Information and communication	208,30	52 720	1 545 820	7,4	67,98
K Financial and insurance activities	1 225,34	55 275	1 000 897	0,8	7,88
L Real estate	390,20	36 299	1 354 467	3,5	20,86
M Professional, scientific etc	134,80	42 254	1 783 712	13,2	94,65
N Administrative and support	84,00	26 652	4 775 002	56,8	236,45
P Education	95,10	32 825	160 413	1,7	9,01
Q Human health and social work	84,70	30 335	18 676 312	220,5	1072,98
R Arts, entertainment and recreation activities	275,80	27 361	18 984	0,1	0,30
All			44 241 017	398,8	1956,31

When looking at procurement decisions, we must first consider the SME policy. The policy makers are usually from the national level, but implications can be on a local level. The figures show that the SME share of public procurement is equal to SME share of GNP. The procurers could be satisfied with measures not to exclude SMEs by formulations in the tender documents

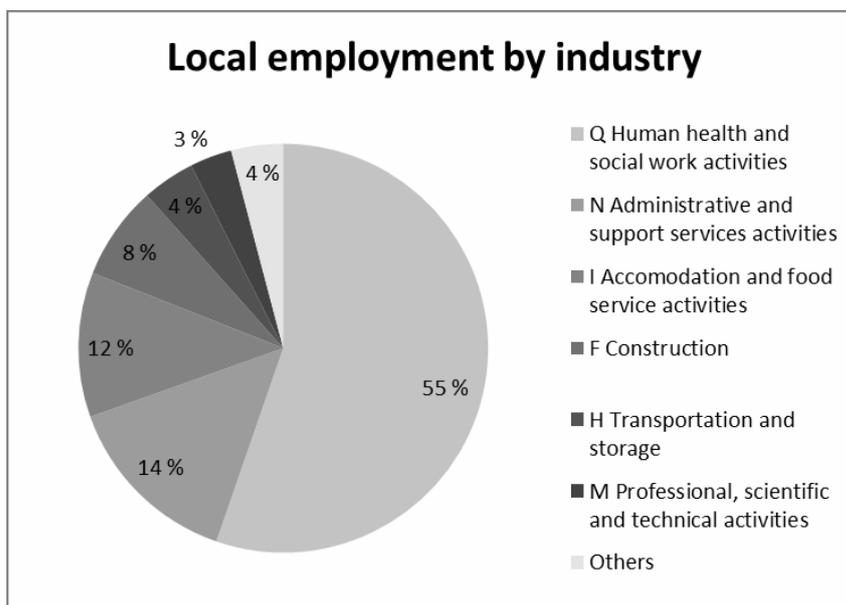
Major procurement decisions are connected to the share of local suppliers and their employment potential. The employment creates the municipal tax revenue. The calculation of employment from procurement volumes was made using the following procedure.

Municipalities have a national recommendation regarding the accounts compatible for delivering the financial data for the national statistical bureau (Heinonen, 2012). From this recommendation, we chose the accounts including procurement (customer service, other services, supplies, the parts of subsidies including procurement, and investments). Each of the accounts was connected to a specific industry classification (TOL, 2008) used by the national bureau of statistics. Further, the procurement volume was converted to FTE employees using the turnover and number employed from statistics: "Enterprises by

industry and turnover, 2013-2014” In the case of public suppliers, the corresponding figures from the private industry were used. This number will give a robust estimation of employment.

The tax revenue of the municipalities was calculated based on the same statistics using salaries and the number of people employed, giving the annual salary by employee and converting it to municipality tax using the calculation rules from the tax administration.

FIGURE 10
Sastamala Local Employment by Industry



The municipality tax is based on the assumption that employees also reside in the same municipality in which they work. This is likely in the case examples where the municipality is surrounded by smaller municipalities, whereas in the metropolitan area and in larger regions, it is unlikely. However, the assumption gives a robust estimation of the tax revenue effects on the municipality.

SME and local procurement are parts of sustainable procurement, as already presented in the literature. Therefore, they are well suited to corporate sustainability reports showing the share of SMEs and local suppliers on the first tier level. The

additional level could present the measures and figures on the second tier level, as presented by Cabras (2011).

DISCUSSION

The aim of this study was to analyze the local and SMEs access to public procurement in seven municipalities. We used invoice data to analyze procurement distribution to different supplier types, and share of local procurement. We also draw a calculation method for employment and local tax revenue. Our findings are that this type of analysis was new to municipalities and the access to local companies was an interesting contribution to be further developed within municipalities.

The study has three different types of implications. First, there are some policy implications: In the literature it seems that the existence of SME policies is motivated by innovations, company growth, or the local economy. To achieve these effects, we should use innovation policy, growth policy, and local procurement policy because the average SME does not produce those values. Many of the previous researchers seem to motivate SME policies with innovation arguments without criticism. From SME policy viewpoint in the European Common Market recent studies in Finland (TEM 2014) and this study, and in Sweden by Stake (2014), show that SMEs can take their equal share of the public procurement either in competition or in procurement practices under threshold values. We should consider measures that do not exclude SMEs from obtaining their share of the turnover. From equality point of view this could be the motivation for SME policy, whereas otherwise any type of organization should be equally treated.

Local procurement can be enhanced with a procurement strategy, especially in labor intensive industries such as social services and healthcare, construction, and professional services. There is little to no effect on the national level, unless there are economies of scale in special services for narrow social groups. Conversely, there can be effects at the international level on specialization, as shown by Brulhart and Trionfetti (2003).

Procurement policies on SME and local enterprises are well suited in the sustainability framework. Public entities could measure SME local enterprise access by industry (Kidalov & Snider 2011). An additional view could highlight even second tier suppliers.

Second, as a scientific contribution, this research develops a research method using invoice data and extends the data

captured to suppliers under the threshold values and to procurement outside the directives. It also gives a more detailed description of the supply network characteristics than the existing research and raises the question of in-house suppliers.

Third, this study provides also some implications for practitioners. With an active procurement strategy, it is possible to achieve a greater share of local enterprises and increase a municipality's tax revenue. An analysis of what is not procured locally reveals the share of procurement that could be directed to local businesses. The recent developments in small-procurement systems focus mainly on under threshold values, representing a smaller procurement volume.

Further research should be directed to in-house procurement and using this rich database to quantify public procurement processes on a national level. Additional investigations could be made studying the dynamic effects of local procurement, as presented by Cabras (2011).

ACKNOWLEDGEMENTS

Thanks to my colleague Matti Riuttamäki for assisting me in the consultancy project with the municipalities. Thanks also to Dr. Antero Tervonen for his guidance and comments on using accounting data.

REFERENCES

- Brammer, S., & Walker, H. (2011). "Sustainable Procurement in the Public Sector: An International Comparative Study." *International Journal of Operations & Production Management*, 31 (4): 452-476.
- Brulhart, M., & Trionfetti, F. (2004). "Public Expenditure, International Specialisation and Agglomeration." *European Economic Review*, 48 (4): 851-881.
- Cabras, I. (2011). "Mapping the Spatial Patterns of Public Procurement." *International Journal of Public Sector Management*, 24 (3): 187-205.
- Erridge, A. (2007). "Public Procurement, Public Value and Northern Ireland Unemployment Pilot Project." *Public Administration*, 85 (4): 1023-1043.
- European Commission (2014). *Directive 2014/24/EU*. [Online]. Available at <http://eur-lex.europa.eu/eli/dir/2014/24/oj> [Retrieved March 1, 2015].

- Finnish Statistical Bureau (2014). "Enterprises by Industry and Turnover by Statistical Reference Year, ToI classification 2008, statistics from year 2014. [Online]. Available at A HREF=<http://www.stat.fi/til/yrti/index.html> TARGET=_blank>Tilaston kotisivu. [Retrieved March 30, 2016].
- Flynn, A., McKeivitt, D., & Davis, P. (2015). "The Impact of Size on Small and Medium-Sized Enterprise Public Sector Tendering." *International Small Business Journal*, 33 (4): 443-461.
- Flynn, A., & Davis, P. (2015). "The Rhetoric and Reality of SME-Friendly Procurement." *Public Money & Management*, 35 (2): 111-118.
- Gioia, D., Corley, K., & Hamilton, A. (2013). "Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology." *Organizational Research Methods*, 16 (1), 15-31.
- Heinonen, A. (2012). "Tililuettelomalli Kunnille ja Kuntayhtymille." (Federation of Finnish Municipalities: Recommendation of model accounts for municipalities and joint municipalities. Helsinki, Finland: Suomen Kuntaliitto.
- Karjalainen, K., & Kempainen, K. (2008). "The Involvement of Small- and Medium-Sized Enterprises in Public Procurement: Impact of Resource Perceptions, Electronic Systems and Enterprise Size." *Journal of Purchasing & Supply Management*, 14: 230-240
- Kidalov, M., & Snider, K. (2011). "US and European Public Procurement Policies for Small and Medium-Sized Enterprises (SME): A Comparative Perspective." *Business and Politics*, 13 (4). Article 2.
- Kivistö, T., & Virolainen, V-M. (2015). "The Monetary Value of Public Procurement." Paper presented at the 24th Annual IPSERA Conference, Amsterdam, The Netherlands.
- Kornecki, J. (2011), "Small and Medium-Sized Enterprises on the Public Procurement Market in Poland." *Equilibrium*, 6 (2): 23-45.
- Lehtinen, U. (2012). "Sustainability and Local Food Procurement: A Case Study of Finnish Public Catering." *British Food Journal*, 114 (8): 1053-1071.
- Loader, K. (2011). "Are Public Sector Procurement Models and Practices Hindering Small and Medium Suppliers?" *Public Money & Management*, 31 (4): 287-294.
- Loader, K. (2015). "SME Suppliers and the Challenge of Public Procurement: Evidence Revealed by a UK Government Online

Feedback Facility.” *Journal of Purchasing & Supply Management*, 21: 103–112

- Loader K, & Norton, S. (2015). “SME Access to Public Procurement: An Analysis of the Experiences of SMEs Supplying the Publicly Funded UK Heritage Sector.” *Journal of Purchasing & Supply Management*, 21: 241–250.
- Mamavi, O., Nagati, H., Wehrle, F., & Pache, G. (2014). “Out of Sight, Out of Mind? Supplier Spatial Proximity in French Public Procurement.” *International Journal of Public Sector Management*, 27 (6): 486-500.
- McKevitt, D., & Davis, P. (2013). “Microenterprises: How They Interact with Public Procurement Processes.” *International Journal of Public Sector Management*, 26 (6): 469-480.
- NERA (2005). *A Study of the Benefits of Public Sector Procurement*. [Online]. Available <http://www.nera.com/publications/archive/2005/a-study-of-the-benefits-of-public-procurement-from-small-business.html> [Retrieved April 12, 2016]
- Nicholas, C., & Fruhmann, M. (2014). “Small and Medium-sized Enterprises Policies in Public Procurement: Time for a Rethink?” *Journal of Public Procurement*, 14 (3): 328-360.
- Nijaki, L., & Worrel, G. (2012). “Procurement for Sustainable Local Economic Development.” *International Journal of Public Sector Management*, 25 (2): 133-153.
- Prier E., & McCue C. (2009). “The Implications of a Muddled Definition of Public Procurement.” *Journal of Public Procurement* 9, (3/4): 326-370.
- PWC (2014, February). *SMEs’ Access to Public Procurement Markets and Aggregation of Demand in the EU* (A Study Commissioned by the European Commission, DG Internal Market and Services). [Online]. Available at http://ec.europa.eu/internal_market/public_procurement/docs/modernising_rules/smes-access-and-aggregation-of-demand_en.pdf. [Retrieved March 14, 2016].
- Qiao, Y., Thai, K., & Cummings, G. (2009). “State and Local Procurement Preferences: A Survey.” *Journal of Public Procurement*, 9 (3–4): 371–410.
- Stake, J. (2014). “SME Participation and Success in Public Procurement.” Paper Presented at the 6th International Public Procurement Conference, Dublin, Ireland.
- Tammi, T., Saastamoinen, J., & Reijonen, H. (2014). “Market Orientation and SMEs’ Activity in Public Sector Procurement

Participation.” *Journal of Public Procurement*, 14 (3): 304-327.

TEM (2014). *Pk-yritysten osallistuminen, näkemykset ja kokemukset julkissa hankinnoissa* (Ministry of Employment and Economy: SME access, perceptions and experiences in public procurement). [Online]. Available at https://www.tem.fi/files/42772/TEMjul_54_2014_web_15012015.pdf [Retrieved March 31, 2016].

Walker, H., & Preuss, L. (2008). “Fostering Sustainability Through Sourcing from Small Businesses: Public Sector Perspectives.” *Journal of Cleaner Production*, 16: 1600–1609.

Williams, A. (2014). “Local Preferencing for Local Suppliers: Examining the Use of Locality in Public Procurement.” *Public Money & Management*, 34 (3): 165-172.

ACTA UNIVERSITATIS LAPPEENRANTAENSIS

- 894.** HARMOKIVI-SALORANTA, PAULA. Käyttäjät liikuntapalvelujen kehittäjinä - Käyttäjälähtöisessä palveluinnovaatioprosessissa käyttäjien tuottama tieto tutkimuksen kohteena. 2020. Diss.
- 895.** BERGMAN, JUKKA-PEKKA. Managerial cognitive structures, strategy frames, collective strategy frame and their implications for the firms. 2020. Diss.
- 896.** POLUEKTOV, ANTON. Application of software-defined radio for power-line-communication-based monitoring. 2020. Diss.
- 897.** JÄRVISALO, HEIKKI. Applicability of GaN high electron mobility transistors in a high-speed drive system. 2020. Diss.
- 898.** KOPONEN, JOONAS. Energy efficient hydrogen production by water electrolysis. 2020. Diss.
- 899.** MAMELKINA, MARIA. Treatment of mining waters by electrocoagulation. 2020. Diss.
- 900.** AMBAT, INDU. Application of diverse feedstocks for biodiesel production using catalytic technology. 2020. Diss.
- 901.** LAPIO-RAPI, EMILIA. Sairaanhoitajien rajatun lääkkeenmääräämistoiminnan tuottavuuden, tehokkuuden ja kustannusvaikuttavuuden arviointi perusterveydenhuollon avohoidon palveluprosessissa. 2020. Diss.
- 902.** DI, CHONG. Modeling and analysis of a high-speed solid-rotor induction machine. 2020. Diss.
- 903.** AROLA, KIMMO. Enhanced micropollutant removal and nutrient recovery in municipal wastewater treatment. 2020. Diss.
- 904.** RAHIMPOUR GOLROUDBARY, SAEED. Sustainable recycling of critical materials. 2020. Diss.
- 905.** BURGOS CASTILLO, RUTELY CONCEPCION. Fenton chemistry beyond remediating wastewater and producing cleaner water. 2020. Diss.
- 906.** JOHN, MIIA. Separation efficiencies of freeze crystallization in wastewater purification. 2020. Diss.
- 907.** VUOJOLAINEN, JOUNI. Identification of magnetically levitated machines. 2020. Diss.
- 908.** KC, RAGHU. The role of efficient forest biomass logistics on optimisation of environmental sustainability of bioenergy. 2020. Diss.
- 909.** NEISI, NEDA. Dynamic and thermal modeling of touch-down bearings considering bearing non-idealities. 2020. Diss.
- 910.** YAN, FANGPING. The deposition and light absorption property of carbonaceous matter in the Himalayas and Tibetan Plateau. 2020. Diss.
- 911.** NJOCK BAYOCK, FRANCOIS MITERAND. Thermal analysis of dissimilar weld joints of high-strength and ultra-high-strength steels. 2020. Diss.
- 912.** KINNUNEN, SINI-KAISU. Modelling the value of fleet data in the ecosystems of asset management. 2020. Diss.

913. MUSIKKA, TATU. Usability and limitations of behavioural component models in IGBT short-circuit modelling. 2020. Diss.
914. SHNAI, IULIA. The technology of flipped classroom: assessments, resources and systematic design. 2020. Diss.
915. SAFAEI, ZAHRA. Application of differential ion mobility spectrometry for detection of water pollutants. 2020. Diss.
916. FILIMONOV, ROMAN. Computational fluid dynamics as a tool for process engineering. 2020. Diss.
917. VIRTANEN, TIINA. Real-time monitoring of membrane fouling caused by phenolic compounds. 2020. Diss.
918. AZZUNI, ABDELRAHMAN. Energy security evaluation for the present and the future on a global level. 2020. Diss.
919. NOKELAINEN, JOHANNES. Interplay of local moments and itinerant electrons. 2020. Diss.
920. HONKANEN, JARI. Control design issues in grid-connected single-phase converters, with the focus on power factor correction. 2020. Diss.
921. KEMPPINEN, JUHA. The development and implementation of the clinical decision support system for integrated mental and addiction care. 2020. Diss.
922. KORHONEN, SATU. The journeys of becoming and being an international entrepreneur: A narrative inquiry of the "I" in international entrepreneurship. 2020. Diss.
923. SIRKIÄ, JUKKA. Leveraging digitalization opportunities to improve the business model. 2020. Diss.
924. SHEMYAKIN, VLADIMIR. Parameter estimation of large-scale chaotic systems. 2020. Diss.
925. AALTONEN, PÄIVI. Exploring novelty in the internationalization process - understanding disruptive events. 2020. Diss.
926. VADANA, IUSTIN. Internationalization of born-digital companies. 2020. Diss.
927. FARFAN OROZCO, FRANCISCO JAVIER. In-depth analysis of the global power infrastructure - Opportunities for sustainable evolution of the power sector. 2020. Diss.
928. KRAINOV, IGOR. Properties of exchange interactions in magnetic semiconductors. 2020. Diss.
929. KARPPANEN, JANNE. Assessing the applicability of low voltage direct current in electricity distribution - Key factors and design aspects. 2020. Diss.
930. NIEMINEN, HARRI. Power-to-methanol via membrane contactor-based CO₂ capture and low-temperature chemical synthesis. 2020. Diss.
931. CALDERA, UPEKSHA. The role of renewable energy based seawater reverse osmosis (SWRO) in meeting the global water challenges in the decades to come. 2020. Diss.



ISBN 978-952-335-583-5
ISBN 978-952-335-584-2 (PDF)
ISSN-L 1456-4491
ISSN 1456-4491
Lappeenranta 2020