



Master's degree thesis

LOG950 Logistics

**Public procurement for innovation in Norway:
Case studies and PLS-SEM analysis of public
purchasers' views**

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Preface

Demand is a critical driver of innovation among suppliers in any economic setting, and previous studies have concluded that generally, public procurement plays a significant role in promoting innovation. This is due to the large expenditures involved in civil public procurement. For example, the total value of public procurement in Norway in 2015 was 480 billion NOK, an amount that makes the government one of the largest buyers in the country, and hence the largest source of demand for many businesses. That being the case, public procurement is one of the ways that can be employed to enhance innovation.

The aim of both the new Norwegian law (Lov om offentlige anskaffelser (anskaffelsesloven) LOV-2016-06-17-73) and the EU Directive (Directive 2014/24/EU) is among other to make way for more innovation that arises from the demand created by public procurement. But we still see that public purchasers often tend to adopt a risk-averse approach to procurement, that does not promote innovation. Public purchasers still emphasize terms of reference and consider the lowest bids or lowest price as the main criterion when assessing bids. So, despite EU procurement directives, public purchasers continue to pay little attention to prioritizing innovative solutions and techniques that spur innovation.

The study aims to further build on the guidelines that exist to ensure that public procurement of innovation is more successful, based on the views of public purchasers regarding innovative public procurement in Norway that this study develops into insights. The study explores and describes the Norwegian public purchaser's views on implementation of public procurement of innovative solutions (PPI) by use of six exploratory case study interviews, and survey research with 114 respondents. The study builds on existing theory and research in the field and contributes to the research on the topic regarding the purchaser's attitudes towards PPI and what they regard as barriers and critical success factors to achieve success. The results of this study show that there seems to be a clear indication that strengthening the purchaser's perceptions of the prospects of PPI with the right use of PPI training and leader involvement has a large positive effect on the attitudes of the Norwegian public purchasers towards public procurement of innovative solutions. There are also shown a rather surprising result that indicates that the share volume of applying and reporting procedures involved in economic risk reducing incentives actually lowers the public purchasers total attitude towards PPI.

Explanation of terms and concepts

DIFI: The Directorate for Administration and ICT is a Norwegian state directorate, which was established on the first of January 2008 and is under the Ministry of Local Government and Modernization. The agency has particular responsibility for digitizing the public sector, public procurement and management development

HORIZON 2020: Horizon 2020 is the biggest EU Research and Innovation program ever with nearly €80 billion of funding available over 7 years (2014 to 2020)

KS: KS is the municipality's interest and employer's organization in Norway. KS organizes all the counties and a large number of municipalities.

NHO: The Business Organization's main organization is Norway's largest corporate interest organization.

PUBLIC PROCUREMENT: Public procurement is the procurement of goods, services or constructions on behalf of a public authority.

PPI: Public procurement of innovative solutions.

RFI: A request for information is a standard business process whose purpose is to collect written information about the capabilities of various suppliers

SME: Small and medium enterprises.

TENDER: A binding offer from the supplier that the client can accept

TENDER DOCUMENT: A written document by the purchaser to potential suppliers of a good or service to inform them about the information required for the buyer to choose among them.

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CHAPTER 1

Introduction and aim of the study

1.1 Background

Demand is a critical driver of innovation among suppliers in any economic setting (Edler and Georghiou 2007). Previous studies conducted have concluded that generally, public procurement plays a significant role in promoting innovation (Palmberg 2004). This is due to the large expenditures involved in civil public procurement. For example, the total value of public procurement in Norway in 2015 was 480 billion NOK (Statistics Norway 2016), an amount that makes the government one of the largest buyers in the country, and hence the largest source of demand for many businesses. That being the case, public procurement is one of the ways that can be employed to enhance innovation. The more extreme and well-known game-changing innovations that have been spawned from governmental demand are the internet and global positioning systems (Edler and Georghiou 2007).

For public procurement to be successful in driving innovation from the big demand that it can draw strength from, there are several key success factors to consider. But there are also some pitfalls and barriers that must be overcome. Some of the success factors described in literature are to involve the market ahead of the actual tender competition and go into dialog with the suppliers, and to start early on by defining the actual needs with the involvement of more people. It is also important to check what the market can provide with today's technology, and make sure that the market gets a good understanding of the purchaser's actual needs. And another important fact is that when the need is put forward to the market and the suppliers, to use functional requirements instead of specified solutions so that the suppliers can make use of their skills and innovative capabilities (DIFI 2017b).

Research on barriers for innovation reported by Uyarra et al. (2014) has revealed among others what the suppliers regard as the main challenges for public procurement for innovation. Suppliers reported that they referred to the low interaction with procuring organizations, the use of over-specified tenders as opposed to outcome-based specifications, low competences of purchasers and poor management of risk as the main barriers and challenges to achieve

innovation. Additional key concerns from the supplier's side of view are among other difficulties for participation in the tender competitions because of pre-qualification procedures and conditions, lack of feedback to unsuccessful tenders, and the public agencies low appreciation of unsolicited ideas.

Another study by Edler and Yeow (2013) focuses more on the general barriers for public procurement for innovation and defines that the following four are the most important to address. **1:** Understanding and assessing the market and its opportunities, regarding what is already offered in the market, and what the market could possibly deliver if asked for. **2:** Being able to understand need, and the functional improvements that is possible through innovation. **3:** Incentive structures that reflect the risk involved aiming for innovative procurement. This is to ensure that those organizational units that bears the risk, also share some of the efficiency or reputational gains that are associated with innovation. **4:** Being able to implement the innovation and change the organizational procedures, the routines and the actual capacities that are needed to do so.

In 2017 the new Norwegian law with the additional regulations regarding public procurement came into play. One important aim of this is to make public procurement in Norway more in line with new EU directive that aims for more innovation (Directive 2014/24/EU). There exists today a gap in the research literature. And this gap is to capture more of the views of the Norwegian public purchasers. This regards their *attitudes towards PPI*, what *they* perceive as the current barriers, and what *they* perceive as critical success factors to achieve success with the *implementation* of public procurement for innovation, after the new EU directive from 2014 and the new Norwegian Law for public procurement of 2017 has come into play. The focus of the study is thus mainly after the enactment of the new EU procurement directives (Directive 2014/24/EU) and procurement over the European Economic Area threshold values in § 5-3 of the Norwegian public procurement regulations.

The study aims to build on the guidelines that exist to ensure that the implementation of public procurement for innovation is more successful in Norway, based on the views of Norwegian public purchasers regarding PPI in Norway. The study explores and describes the Norwegian public purchaser's views on implementation of public procurement of innovative solutions (PPI). The study builds on existing theory and research in the field, and ultimately contributes to the research on the topic with insights regarding what the Norwegian purchasers regard as

barriers and critical success factors to achieve success with implementation of PPI, and also what has an effect on their attitudes towards it. More knowledge about this acts as a supplement when designing best practice guidelines to assure success with implementation of PPI. The results of this study show that there seems to be a clear indication that strengthening the purchaser's perceptions of the prospects of PPI with the right use of PPI training and leader involvement has a large positive effect on the attitudes of the Norwegian public purchasers. There are also shown a rather surprising result that indicates that the share volume of applying and reporting procedures involved in economic risk reducing incentives actually lowers the public purchasers' total attitude towards PPI.

1.2 My own reason for choice of topic

It was intriguing for me to gain knowledge about the public purchaser's views on the implementation of public procurement for innovation, and to get knowledge if the literature fits the views of the purchasers in Norway.

My own interests in this topic is resulting from my daytime job since 2011 in one of Norway's biggest Facility management companies. My job is mainly concerned with preparation and submission of tenders towards public procurement above the threshold values for public procurement that is regulated in the Norwegian Public procurement regulations part I and III. I have always been somewhat frustrated in the way the tender documents often outline the solution as they do not give us a possibility to make use of our experience and best practice within our field to deliver what we regard as a better solution to their needs. Sometimes we also experience that when a contract period ends after 4 years for our services, the purchaser puts forward exactly the same tender documents as for the last tender competition four years ago, with even some dates in the document from four years ago that the purchaser has forgotten to change. But this time the tender is even more detailed in the specifications as the purchaser tries to eliminate all the issues that has been unclear from this period, locking the suppliers even more into the outlined solution.

I also wrote my bachelor thesis on mathematical evaluation methods in public procurement, and from that experience I wanted to continue my research on this topic to gain further knowledge and make a beneficial contribution to the literature on the subject of public procurement.

1.3 Problem statement, research questions and definitions

The aim of both the new Norwegian law (Lov om offentlige anskaffelser (anskaffelsesloven) LOV-2016-06-17-73) and the EU Directive (Directive 2014/24/EU) is, among other things, to make way for more innovation that arises from the demand created by public procurement. But, we still see that public procurers often tend to adopt a risk-averse approach to procurement for innovation. Public purchasers still emphasize terms of reference and consider the lowest bids or lowest price as the main criterion, paying little attention to innovative solutions when assessing bids.

However, the extant literature provides limited insights on the perceived *attitudes*, *barriers* and *critical success factors* for successful implementation of public procurement for innovation in the context of Norwegian public procurement. Given the obvious benefits of PPI, and in light of the new EU directive from 2014 and the new Norwegian Law for public procurement of 2017, insights from the study will be of interest to both researchers and other stakeholders.

1.3.1 Research questions

Based on the problem statement the study puts forward 4 main research questions:

1. Why do public purchasers in Norway continue to focus on a risk-averse approach to procurement?
2. What do public purchasers in Norway regard as the main challenges in implementing public procurement of innovative solutions (PPI)
3. What do public purchasers in Norway regard as critical strategic success factors for successful implementation of public procurement of innovative solutions (PPI)?
4. Which factors influence Norwegian public purchasers' attitude towards public procurement of innovative solutions (PPI)?

1.3.2 Definition of innovation and innovative public procurement

According to (Directive 2014/24/EU), innovation means the implementation of a *new or significantly improved* product, service or process. This includes, but not limited to, production, building or construction processes, a new marketing method, or a new organizational method in business practices, workplace organization or external relations inter alia. The European Union is determined to promote implementation innovative solutions in order to solve societal challenges and support the Europe 2020 strategy for smart, sustainable and inclusive growth (The european parliament and the council of the european union 2014).

In line with the above understanding of innovation, Directorate for Administration and ICT (DIFI) defines an innovative procurement is a procurement method where, instead of defining exactly what you want, you describe the need and leave the solution to the vendors. As a buyer, you enter into dialogue with the suppliers before the competition is announced to find out what is possible (DIFI, anskaffelser.no 2018).

1.4 Two different main categories of PPI

There are two separate main categories in innovative public procurement (PPI). This is public procurement for innovation, and public procurement of innovation. The differences between them are important to address.

In principle, public procurement for innovation is applied in all forms of public procurement that actually focus on the usage of functional demands instead of detailed solutions, and thus challenging the suppliers to come up with new or more innovative solutions in all types of public procurement (Menon Economics 2016).

Public procurement of innovation on the other side is a situation that explicitly shall spur innovation through a detailed procurement method with direct demands towards both the purchaser and the supplier regarding innovation. In this situation we are addressing procurement of something that at the current time is not available in the market, and thus there is often a lot of research and development involved (Menon Economics 2016).

1.5 Buildup of this thesis

The remainder of this thesis is organized as follows:

Chapter 2 focuses on relevant laws and regulations for Public procurement in Norway and gives a description of the strategic actions and practices for PPI in Norway and also some financial risk mitigation research and evidence of the effects of successful PPI in Norway.

Chapter 3 describes relevant articles and other literature for PPI. Chapter 4 goes on to describe the research methods used in this study. Chapter 5 contains analysis and summary of six case studies. Chapter 6 describes the buildup of the survey with constructs for analysis and hypotheses. In this chapter the survey is also analyzed, and the hypotheses are tested. Chapter 7 contains the discussion and several limitations of the study. Chapter 8 regards the conclusion, recommendations, and also possible future research.

CHAPTER 2

Public procurement of innovative solutions in Norway

2.1 Norwegian law and regulations for public procurement

In this section relevant laws and regulations regarding public procurement and PPI in Norway will be reviewed. The focus will be on relevant paragraph's regarding innovation.

Public procurement is strictly regulated, and therefore it is appropriate to first address the laws and regulations that are most relevant for this study.

2.1.1 Norwegian law for public procurement

The Norwegian law for public procurement (Lov om offentlige anskaffelser (anskaffelsesloven) LOV-2016-06-17-73) main goal is to promote effective usage of the Norwegian societies resources. It also demands that the public agencies act with integrity to achieve that the population has trust that public procurement is carried out in a socially beneficial way. Norwegian public procurement act § 1. Furthermore, according to the Norwegian public procurement act § 4 the public purchaser shall act in accordance with the basic principles of competition, equal treatment, predictability, verifiability, and correct proportionality. The purchaser *can* put forward demands and criteria in different steps in the procurement process so that public contracts is carried out in such a manner that promotes environmental issues, innovation, and societal issues, if the demands and criteria is relevant with the delivery. Norwegian public procurement act § 5 (Norwegian public procurement act 2017).

2.1.2 Norwegian public procurement regulations

The Norwegian regulations for public procurement § 1-1, and 1,2 give further guidelines to the Norwegian public procurement act. And it states that it is mandatory to follow for all governmental agencies, counties, municipalities, and all public agencies that contracts products, services or construction that has a value of NOK 100.000,- or more excluding VAT. The Norwegian regulations for public procurement § 4-5 defines several relevant issues such as innovation. Innovation is described according to Directive 2014/24/EU. Innovation means the

implementation of a *new or significantly improved* product, service or process, including but not limited to production, building or construction processes, a new marketing method, or a new organizational method in business practices, workplace organization or external relations (Norwegian regulations for public procurement 2017).

The Norwegian regulations for public procurement are divided into several parts. Part I is mandatory for all public procurement that is according to § 1-1 and § 1-2 in the Norwegian regulations for public procurement. Part III are relevant to contracts that has a value of more than, or equal to the European Economic Area threshold values in § 5-3 first paragraph. The Norwegian regulations for public procurement § 5-1. The Norwegian regulations for public procurement § 5-3 states that the European Economic Area threshold values are NOK 1.100.000,- excluding VAT for governmental commodity and service contracts and planning and design contests while it is NOK 1.750.000,- excluding VAT for other contractor's commodity and service contracts and planning and design contests. For construction it is NOK 44.000.000,- excluding VAT, and for health and social services its NOK 6.300.000,- excluding VAT (Norwegian regulations for public procurement 2017).

2.1.3 Norwegian regulations for public procurement Part III

For the bigger procurements regulated by part III of the regulations, the purchaser is always allowed to use open tendering or restricted tender competition. The purchaser may use competition for innovation partnership to develop and procure innovative goods, services or construction work. The purchaser may use competition with negotiation after prior announcement, and competitive dialogue, only when the conditions in § 13-2 are met. The Norwegian regulations for public procurement § 13-1. The Norwegian regulations for public procurement § 13-2 states that the purchaser may use competition with negotiation after prior announcement and competitive dialogue if the needs cannot be met without making any adjustments in already available solutions. The procurement includes design or *innovative solutions*. The nature of the purchase, complexity, legal or financial composition or associated risk makes it necessary to negotiate. Or the contracting entity cannot adequately pinpoint the requirements specifications by reference to a standard European technical assessment, common technical specification, or technical reference (Norwegian regulations for public procurement 2017).

The Norwegian regulations for public procurement § 12-1 states that the purchaser may conduct market research to prepare the procurement and provide information to the suppliers about its plans and needs. The purchaser may also seek or receive advice from independent experts, authorities, suppliers, or other market players. The advice can be used in the planning and execution of the procurement. The prerequisite is that the councils do not have anti-competitive effects or lead to breach of the principle of equal treatment. But according to the Norwegian regulations for public procurement § 12-2 when a supplier or a company affiliated with the supplier has advised the principal prior to the competition, the principal shall respond appropriately to ensure that the supplier does not receive an unfair competitive advantage if he participates in the competition. The same applies if the supplier has been involved in the planning of the competition in another way (Norwegian regulations for public procurement 2017).

The Norwegian regulations for public procurement § 15-1 states that the purchaser needs to make tender specifications. And the specifications must specify the requirements imposed on the characteristics of the goods, services, or construction work that the contractor is required to acquire. The requirements shall be related to the delivery and proportionate to the purpose and value of the acquisition. Unless otherwise stipulated in legally binding technical regulations, the requirements shall be made (a) as performance or functional requirements, including environmental characteristics; (b) referrals to technical specifications and, in order of order, national standards implementing European standards, European technical assessments, common technical specifications, international standards or other technical references. If none of these exist, the requirements specifications shall refer to national standards, technical approvals or technical specifications for the design, calculation and execution of construction work and use of the goods. If the contracting entity makes performance or functional requirements he may not refuse an offer if the goods, services or construction services offered comply with national standards implementing European standards, European Technical Ratings, Common Technical Specifications, International standards or other technical references, and these standards are intended to cover performance or performance requirements. The supplier shall adequately demonstrate in the offer that the goods, services or construction work fulfilling the specifications meet the performance or functional requirements (Norwegian regulations for public procurement 2017).

According to the Norwegian regulations for public procurement § 24-8. Rejection due to conditions in the tender from the supplier is mandatory if the offer contain significant deviations from the procurement documents.

2.1.4 Norwegian guidebook for rules and regulations in public procurement

The Norwegian guidebook for the rules in regulations in Norway for public procurement states that dialogue with the market has been possible also in accordance with old regulations before the new law for public procurement in 2017 came into play, but this was not clear from the rules itself. This has created uncertainty. Dialogue between contractors and suppliers can be a good tool in preparing an upcoming competition to create the most effective results (Norwegian Guidebook for Public Procurement Regulations 2017).

The tender specifications specify the requirements that are set for the characteristics of the delivery. This follows from § 15-1. Requirements specifications can be designed either as performance or functional descriptions, using technical specifications or by a combination of these. The specification must be described in sufficient detail so that suppliers get a clear picture of what to procure and what requirements and wishes the client has for the purchase. An unclear tender specification may also be in violation of the basic principles of the Procurement Act § 4. This does not mean that the purchaser must necessarily design a particularly detailed requirement specification. It may be sufficient for the purpose and value of the acquisition to provide a functional description and that the purchaser may allow suppliers to determine how the need is to be solved. If the purchaser is to evaluate the offerings solely based on the lowest price or cost, it may be appropriate with more detailed technical specifications. And in the opposite case if the purchaser is to put more emphasis on quality and innovative solutions, it may be appropriate for a more open functional description. Performance and performance requirements describe requirements related to delivery performance and the purchaser's needs. Performance and performance requirements are in line with delivery results and effects, rather than requiring exact precautions or detailed specifications. The use of performance and functional requirements thus opens the way for suppliers to offer the best solutions to the market on the client's specified needs. The purchaser should therefore use performance and functional requirements as far as possible in view of the specific acquisition. In this way, suppliers are free to offer the most innovative, updated, efficient and cost-effective solutions the market has to offer. The supplier shall adequately demonstrate that the delivery fulfills performance or functional requirements. If the delivery meets the standards mentioned in

section 15-1 third paragraph letter b and these standards are intended to cover the specified performance or functional requirements, the purchaser cannot reject the offer (Norwegian Guidebook for Public Procurement Regulations 2017).

2.2 Norwegian goals regarding innovation

In this section literature regarding public procurement in Norway will be elaborated on.

In 2013, the Norwegian government put forward a strategy document that will be evaluated in 2018. The document states several goals, and actions, to deliver upon these goals. Derived from these strategic actions comes the responsibilities for several public agencies in Norway such as DIFI and Innovation Norway.

- Public procurements shall be a strategic tool in governmental development work.
- Public agencies shall have an effective dialog with the market about their development needs.
- Public agencies shall have the tools and knowledge they need to make innovative procurement.
- Research and development work shall give better public procurement.
- The knowledgebase shall be strengthened (Ministry of Trade and Industry 2013).

From this, we observe that there is actual strategic anchoring for PPI at the governmental level in Norway.

2.2.1 Norwegian government strategic actions regarding innovation

After the enactment of the new EU procurement directives (Directive 2014/24/EU) some changes have come into play regarding public procurement in Norway. The main goals regarding the new directives are to make way for easier and more flexible rules, and to safeguard the environment, social aspects and of course make way for more innovation driven by public procurement (Government 2017).

- DIFI gets together with Innovation Norway and the Norwegian research council a leading role in making good methods well know.

- The government will put in action a pilot project with funding aimed towards the business world that public agencies can use for concrete innovation purposes.
- The government shall continue its support for NHO and KS National supplier development program.
- The arrangement with governmental research and development contracts that is administrated by Innovation Norway shall continue. The government will continue its focus on public research and developments contrast within the current framework.
- Municipalities and counties is encouraged to aim for long lasting purchasing needs.
- The government encourages public agencies to incorporate responsibility for procurements in leading contracts where this is relevant.
- The government encourages public agencies to develop purchasing strategies, or developments plans where procurement is a part where this is rational and appropriate.
- The government shall continue to implement collaborate purchasing in state sector when this is expedited.
- There is put forward a project to map how the procurement statistics can be improved (Ministry of Trade and Industry 2013).

2.2.2 Norwegian Agency for Public Management and eGovernment

DIFI works to ensure that government administration in Norway is characterized by excellence, efficiency, user orientation, transparency, and democracy. The aim of DIFI is to strengthen the government's work in renewing the Norwegian public sector and improve the organization and efficiency of government administration. DIFI also aims to develop the organization and leadership of the public sector, with coordination among public authorities and services (DIFI 2017c).

With the new Directive and also the new law of public procurement in Norway that came into play in 2017 there is also put forward a new procedure that is strictly aimed towards procurement of innovation that is called innovation-partnership. This procedure is only used when procuring solutions that is not already in the market. Thus, this is aimed directly towards

creating new innovative solutions, products and constructions work to solve a specific need. The solution is a collaboration between the principal and the agent. So, there is really a high focus to make way for more innovation (DIFI 2017a). But we must not forget the definition of innovation that states that there is also innovation when an already existing product or service is significantly improved. And the fact that PPI deals with both public procurement of innovation and public procurement for innovation.

DIFI advice for success with public procurement of innovative solutions

DIFI states that in order to be successful regarding PPI the purchaser has to start early by thinking much broader than usual. The purchaser must involve more people when defining the actual needs and describe the needs in a more open way that allows the suppliers to come up with innovative solutions to deliver upon that need.

The purchaser needs to check what the market can actually provide today, and make sure that the market gets a good understanding of the purchasers needs. It's all about the purchaser's competence, and the purchaser's understanding and knowledge about what stimulates innovation.

To make way for public procurement of innovative solutions the purchaser should also involve the market ahead of the actual tender competition. The goal is to convey the need so that the suppliers has leverage to find the most innovative solution (DIFI 2017b).

Figure 1 is a visual representation of the innovative public procurement process.



Figure 1: PPI Process (DIFI 2017b)

As shown by Figure 1, the PPI process proposed by DIFI comprise of four main stages as explained herein below.

Map the users need. In the planning phase of the procurement the purchaser should get a sound understanding of the end user's actual needs. When the need is mapped, it is important to get a broad involvement of people. Remembering that everyone that is involved in the usage of the product or service are users, and not just the end users.

Get in dialog with the market about possible solutions. By having a dialog with the market, the purchaser gains insights about what is available in the market. Maybe there already is a solution that can easily be suited to match the purchasers needs. But the market can also state if there is a need to develop something totally new in order to meet the demand. From the dialog with the market it is possible to discuss strategies regarding suited tender procedure, and development of the contractual details.

Expectations regarding function and performance. to give the suppliers maneuverability the purchaser should describe which need the solutions should satisfy and not give details about a specific solution. A way to do this is by putting forward demands for function, and not a detailed solution that does not make way for innovation.

Tender competition or development. If there already is a solution in the market that can easily be adjusted to match the need of the purchaser, it is recommended to use normal tender competition. But if the solution is not available in the market it is a possibility to make way for a development process. There are several methods for collaboration with suppliers to develop new solutions (DIFI 2017b).

2.3 Norwegian national program for supplier development

The National program for Supplier Development was established in 2010. The goal was to enhance the innovation effect from public procurement. The reason was that Norway needed a change and that it would be in the nation's interest to make way for tomorrows societal difficulties could be solved, at the same time as developing businesses got the opportunity to develop. The initial thought was that public procurement could be used for both. NHO was the

initiative taker, together with KS. DIFI was in 2015 invited into the board and the management of the program at the same level as NHO and KS (Menon economics 2017).

Menon economics has done an analysis of the Norwegian statistical agency innovation research that gives a clear indication. They found that innovative public procurement potentially can have a bigger innovation effect than more traditional innovation political measures. Menon found that suppliers that has been asked for innovation in the public tenders as opposed to the ones that have not, the first group six doubled their research and development investments during the measurement period. Menon also state that there is currently no complete overview of the number of innovative public procurements. But by carrying out searches on www.doffin.no and defining innovative public procurement as acquisitions where purchasers have involved the market or suppliers in the procurement process through a dialogue meeting or other forms of dialog they found that of all listings regarding procurements on www.doffin.no above the threshold values of all acquisitions with a framework of NOK 1.1 million (excluding VAT) there are just 1,4 % that they define as PPI (Menon economics 2017).

There has been identified 96 public organizations that Menon consider to be particularly important players in implementing and sharing knowledge of innovative public procurement. Of the total of 529 innovative public procurements that have been completed in the period 2010-2016, the leading public entities have completed over 43 % (Menon economics 2017).

Of the leading public organization, more than 75 % state that their business has a procurement strategy that includes a dialogue with the market through the procurement process. This suggests that the innovative procurement methodology is largely rooted in management in the largest public-sector organization (Menon economics 2017).

Menon also rapports that a clear majority of the leading companies state that the procurements largely led to innovation. This supports the argument that public procurement can be an important driver for innovation (Menon economics 2017).

An interesting finding from Menon's research is that for those businesses that do not have an innovation-aware procurement strategy, the procurement has to a limited extent led to innovation. In the procurements where the National program for supplier's development is heavily involved, the innovation height is also greater than for the group with smaller public

entities and for those businesses that have not been directly involved with the program (Menon economics 2017).

In summary, we can say that the Menon economic research has shown that innovative public procurement, making public procurement according to a special methodology that specifically favors innovation, significantly increases the level of innovation in public procurement, and hence more innovation in the public sector. And that for those businesses that do not have an innovation-aware procurement strategy, the procurement has to a limited extent led to innovation. In the procurement where the Norwegian national program for supplier development is involved, the innovation height is also greater than for the group with smaller public entities and for those businesses that have not been directly involved with the program (Menon economics 2017).

From the research carried out by Menon economics, it is clear that there exist two different groupings in Norway. The **more experienced leading entities**, and the **les experienced, often smaller public entities**.

2.4 Incentive arrangements for financial risk mitigation in Norway

Norwegian research on the need for financial risk reducing incentives varies. Earlier research on this subject puts less stress on this issue such as (Analysis & Strategy and Oslo Economics 2015) that states that only 15% of the asked Norwegian public purchasers stated that the lack of incentive structures is a barrier for innovation from public procurement. But more recent research by Menon Economics (2016) concludes that there is a need for greater financial risk relief for purchasers. The new research carried out by Menon economics (2016) state that "There is universal agreement among the buyers that an extension and an adjustment of the OFU scheme may be one relevant solution to this" (Menon Economics 2016).

They justify need for financial risk relief for the buyer by two arguments:

1. It provides greater room for risk and thinking new when not the entire financial downside lies with the buyer.

2. State-owned enterprises often have other more commercially profitable projects that are not as innovative. In particular, it is pointed out that this applies to innovative solutions for climate and low emissions. Here, as a rule, there is less experience and expertise, thus increasing the risk.

Menon economics (2016) states that because of the mentioned facts that financial risk relief is sought. But they also point out that public purchaser's state that this is not the most important. Other risks are larger and more important. These risks are that the purchased projects won't be completed on time, or that the procurement is incorrect, so you end up with a bad service or product. And these risks cannot be reduced by just more money. So, incentives must address the actual risks and reduce them. It's about the barriers that occur in the mind of the purchaser when the fear of failure takes over.

Menon Economics has done extensive research and compared the financial measures for increased innovation in purchasing with other countries under review with Norway, and states that Norway has relatively modest efforts. Netherlands, UK and Finland have a more systematic and financially stronger commitment. In Norway, the financial commitment mainly takes place through the OFU scheme, which is much less extensive than the Netherlands, the UK and Finland. In the mentioned countries, a systematic review is done of which social challenges can best be resolved through innovative procurement. In the Norwegian OFU program greater coincidence characterizes this (Menon Economics 2016).

The Norwegian Research Council (NFR) offers support for companies wishing to participate / apply for funds through the world's largest research and innovation program with 80 billion euros spread over seven years called Horizon 2020. This includes project launch support, support for preparing an EU application, **risk relief**, and everything from travel support to consortium building. The NFR covers up to 50 percent of the expenses (Menon Economics 2016).

Menon economics states that there are largely reports of non-financial risks and barriers in terms of what is regarded as challenges in surveys and interview research in Norway and internationally. This is also supported by surveys done by (Analysis & Strategy and Oslo Economics 2015). The figure below shows their findings confirming that financial risk relief thrones at the bottom of barriers to innovation in public procurement.



Figure 2: Reported barriers Norway (Analysis & Strategy and Oslo Economics 2015)

In summary, Menon Economics (2016) states that the review of risks shows that there is a need to design tools so that they reduce the most common barriers. Purchasers report organizational risk as the main barrier and this is resources in terms of competence, management, procedures, mandate from owner / incentives, etc. In Norway we have DIFI focusing on organizational risk. There is overall agreement among the buyers about that an extension of the OFU scheme could be one relevant financial solution in general.

But the public buyers that Menon Economics interviewed in their research are seeing problems with today's financial risk mitigation instrument. Several public purchasers say that the OFU scheme is mostly aimed towards business and suppliers and not the public sector. It is further pointed out that Innovation Norway's schemes largely target small projects, and not against larger, more extensive projects. The public buyers also say that the support from both OFU and other schemes is often spread too thinly for major projects with significant innovation ambition on behalf of the public sector with business development potential for suppliers, can be lifted (Menon Economics 2016).

The scheme therefore delivers relatively well in terms of risk relief to suppliers, preferably smaller companies and projects. But the OFU scheme does not deliver in terms of risk relief to the buyer (Menon Economics 2016).

2.5 Innovation Norway

Innovation Norway has now introduced a new innovation contract that acts as a common term for the previously known OFU scheme (Innovation Norway 2018).

This financial risk mitigation seems to aim mostly at the suppliers in terms of financial relief and may cover up to 45% of the development costs incurred by the Norwegian companies. If a foreign company or public entity needs to develop a new product or service and they are looking for a competent Norwegian small or medium sized company (SME) to solve this issue the grants from innovation Norway can come into play (Innovation Norway 2018). The fact that the SME can reduce its cost, it is fair to assume that this would also benefit the purchaser by lowering cost of the product. But it seems that the program is not directly aimed at the public purchasers.

The grant from Innovation Norway is available to Norwegian companies having the skills and knowledge to develop the products or services the foreign companies or public entities needs but that are not available in the market. So, this grant is not something that seems to be given when innovation is happening to an already existing product or service (Innovation Norway 2018).

To qualify as a customer in an Innovation Contract Innovation Norway states that “you should be a demanding and collaborating customer that takes part in the process by providing details of requirements and testing the result”. There is also a demand put forward that the customers efforts in the project in terms of workload and funding should be at least 20% of total eligible project costs (Innovation Norway 2018).

2.6 Results of PPI in Norway

In this section there will be a short focus on a round of literature review that was carried out in the final weeks before the deadline for this thesis. The results of this thesis focus on the importance of putting forward more evidence that PPI works. This is also an aim put forward by EU in their guidebook (European Commission 2014).

2.6.1 Evidence of successful PPI in Norway

Today in May 2018 there are 295 public organizations that have in some way started to use the innovative public procurement method. This has led to 20 radical innovations, 350 new jobs, almost 2.900 tons in yearly reductions of CO2 equivalents and 334 million NOK in public savings. However, there are only 1,4% of all published procurements on doffin.no that use dialog (innovative procurement 2017a).

One example of success can be the new solution for better indoor climate in existing buildings that Bergen Municipality and Education Building Oslo has carried out. They control buildings that have, combined, over 2 million square meters of floor space. In this innovative procurement, they needed solutions that could streamline the upgrading of ventilation in these existing buildings. They challenged the market for a new solution that would reduce the need for building interventions that can be installed while the building is in use and which reduces construction time (innovative procurement 2017b).

The process was as follows:

Consider needs:

All of the 177 schools and 750 buildings that Education Building Oslo KF is responsible for developing, operating and managing, will be upgraded in terms of indoor environment over a period of 10 years. The same issue was a fact to the 98 schools that the Municipality of Bergen is responsible for. As the two organizations faced the same challenges at about the same time, the two of them joined forces in the further process under leadership of a joint project manager (innovative procurement 2017b).

Plan and organize:

The partners sought solutions that could make upgrading of ventilation in existing buildings more efficient. The aim was to provide new and better solutions for air treatment plants and air distribution in schools, day care centers and nursing homes (innovative procurement 2017b).

Instead of making use of today's solutions, they wanted to challenge the supplier market to come up with the best and most forward-looking solutions. The two aimed at implementing an innovative procurement process, thus benefiting from market expertise. It was a prerequisite for the installation to take place while the schools were in full operation (innovative procurement 2017b).

Dialog with the market:

Cooperation with the National Program for supplier development was established. It was then made invitations to a dialogue conference for relevant suppliers on the 21. of May 2014.

Following the conference, suppliers were invited to make input. Based on received input, those interested in it could get one-on-one with the purchaser to go deeper into their input under "four eyes". The inputs were then taken into account when designing the requirement specification and when making the choice of tender competition form (innovative procurement 2017b).

Conduct the actual tender competition:

Following the dialogue conference, the market was then invited to an innovation competition where the purpose was to develop and deliver suggestions for solutions to the needs and challenges presented at the conference. Initially, the aim was to get innovative solutions that could be developed into prototypes, then possibly carry out traditional procurements. The goal was to get the best possible knowledge of the possibilities and alternative solutions. By joining in this work, the two organizations created a reasonable volume for the relevant suppliers, and it was expected that the suppliers could be tempted. The prized proposals should be continued in development projects. If / when the prototypes exist, the two organizations would then be able to make regular procurement, either jointly or individually, where all interested parties again have the opportunity to participate (innovative procurement 2017b).

Results:

The winners of the innovation contest were Caverion AS and Systemair AS, who won a prize of NOK 100,000 each. Based on the winning proposals, a development phase was initiated to test the solutions. In the fall of 2016 Caverion installed a new air conditioner at Trosterud School - room for room – while the school is in full operation. These types of projects are usually extensive and expensive because the school must be closed completely. Pupils must move to other buildings, which are usually barracks while rehabilitation is taking place. This project will be ongoing while the school is in normal operation and all students are present. Multiconsult's subsidiary Analysis & Strategy has made a profit analysis of the purchase. Only at Trosterud School it is an estimated profit of NOK 10-12 million, as well as savings related to time spent and flexibility. A conservative estimate in the profit analysis shows that Norwegian municipalities can save between 21-26 billion NOK in the next 10 years to rehabilitate ventilation in school buildings in this fashion (innovative procurement 2017b).

CHAPTER 3

Literature review

3.1 Introduction of the chapter

There is widespread consensus that public procurement for innovation (PPI) plays an important role in improving the efficiency and quality of public services along with addressing major societal challenges. Public procurement of innovative goods and services is one of the essential ways for stimulating new technological or service solutions while helping to create jobs (Ministry of Trade and Industry 2013) (European Commission 2014). This way, not only PPI contributes to achievement of best value for public money but also it is critical for attaining wider economic, environmental, and societal benefits through generation of new ideas, translating them into innovative products and services and thus promoting sustainable economic growth (The European Parliament and the Council of the European Union 2014).

But there are also barriers for innovation from public procurement, and one of the biggest ones is the risk aversion of both the public purchasers and the suppliers. The public purchasers often favor low risk approaches regarding procurement, focusing on low price and detailed tender documents outlining the solution, rather than more innovation-based approaches focusing on the function of the product or service. This is due to the fact that the reward in the public sector for being innovative are small when compared to the consequences of purchasing something that fails (Caloghirou, Protogerou and Panagiotopoulos 2015).

3.2 Public procurement as a policy tool for stimulating innovations

Since the 1990's innovation policy has been perceived as a means to act on and improve the performance of innovation systems. Edler and Georghiou (2007) define that the demand side innovation policies as:

All public measures to induce innovations and/or speed up diffusion of innovations through increasing the demand for innovations, defining new functional requirements for products and services or better articulating demand.

Public procurement is thus just one of several policies for the public to stimulate innovation. And it may be seen that demand-side policies can be presented in four main groupings as presented below.

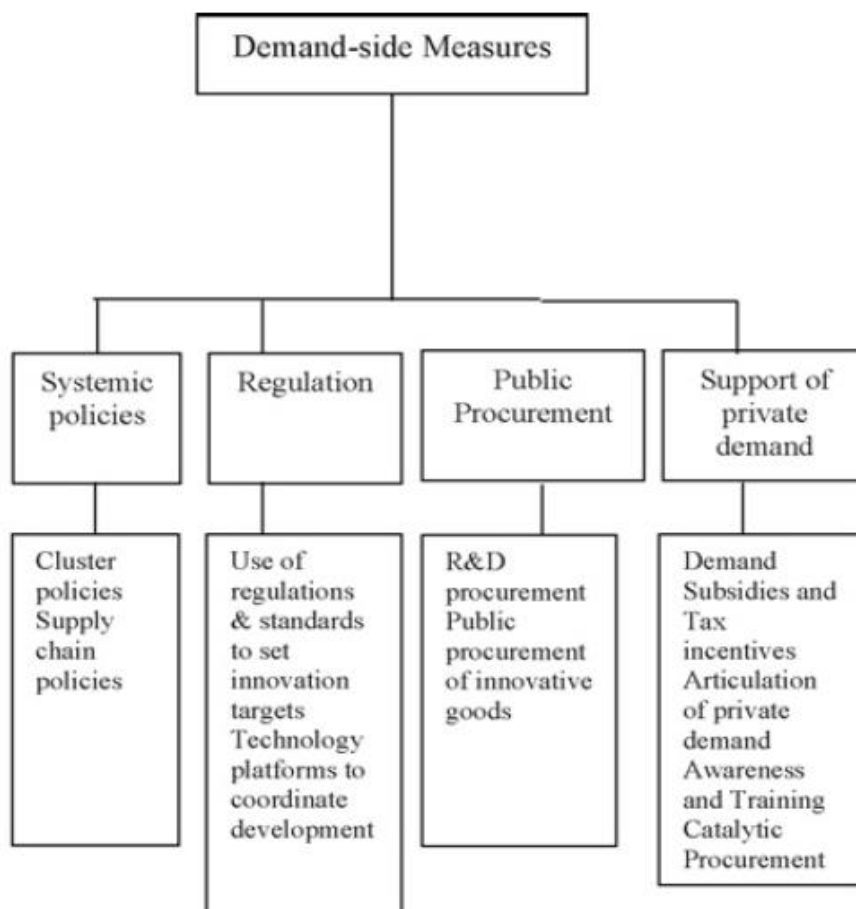


Figure 3: Demand-side policies to stimulate innovation (Edler and Georghiou 2007)

The justifications to make use of public procurement to spur innovation relates to three levels. *Firstly*, public procurement is a major part of “local” demand, which constitutes a major factor in the location decision of multinational enterprises and in the inclination to generate innovations in a given location. *Secondly*, there is a range of market and system failures affecting the translation of needs into functioning markets for innovative products, and public procurement can prove effective in redressing this. *Thirdly*, the procurement of innovative solutions offers a strong potential for improving public infrastructure and public services in general (Edler and Georghiou 2007).

3.3 Public procurement for innovation (PPI)

An innovation policy based on demand derived from the public sector can be defined as actions that aim to elevate the demand for innovation, but it also aims at improving the core conditions for adoption of innovations. The innovation process is actually being spurred when a purchaser demands either something that does not exist in today's market, or by purchasing something with innovative features that can be a fact if the purchaser used functional specifications. A taxonomy of PPI that is based on previous theoretical work consists of two dimensions. The first dimension focuses on the end user of the product, and the second one focuses on the characteristics of the resulting innovation and is built up by three different categories. The three categories are defined as pre-commercial, adaptive and developmental procurement. Pre-commercial innovation is R&D based solutions and is not the actual development of a new product. Adaptive innovation occurs when the product is only new to the region or country and is based on improvements to an existing product. Developmental innovation occurs when a totally new product is created (Caloghirou, Protogerou og Panagiotopoulos 2015).

PPI can bring forward benefits that will be positive for both the public, private sector, and the society. These benefits can be modernization of the public sector, enhancement of public services, the improvement of societal challenges and the elevation of private firm competitiveness (Caloghirou, Protogerou og Panagiotopoulos 2015).

3.4 Innovation from suppliers and classifications of innovation

According to Van Weele (2012), the suppliers are a crucial part in order to bring innovation forward. To drive innovation from suppliers is not always easy, and the literature on the subject varies. Some researchers like Ragatz et al (1987) say that early involvement by the suppliers when creating products gave shorter time to product delivery, higher quality, and shorter time to market. But for instance, Hartley (1994) says that early supplier involvement can lead to the opposite. But based on van Weele's own research in more recent years he concludes that early supplier involvement is a challenging aspect, but it can drive innovation if done correct (van Weele 2012).

Saastamoinen, Reijonen and Tammi (2017) found that clustering with other firms is associated with SMEs' innovative performance, and that this is mediated by customer types both private

and public. Furthermore, public procurement is associated with greater returns in the case of the new products or services. For significantly improved products or services, networks involving other firms may improve performance when the demand originates from private sector customers. The results suggest that SMEs should emphasize networks with other firms rather than public or private research and development actors when they develop new products for the public sector (Saastamoinen, Reijonen and Tammi 2017).

There are also different types of innovation and they are classified as Incremental, Breakthrough, Disruptive and Game-Changing. Incremental innovations are when modest changes to existing products and services happen. Breakthrough innovation refers to large technological advances that propel an existing product or service ahead of competitors. Disruptive innovation is when an innovation result is worse product performance, at least in the near-term. Game-changing innovation transform markets and even society. These innovations have a radical impact on how humans act, think and feel in some way (Kalbach 2012).

3.5 EU Strategic use of public procurement to stimulate innovation

The European Union's Guidebook Series - How to support SME Policy from Structural Funds - Public Procurement as a Driver of Innovation in SMEs and Public Services states that innovation is crucial to achieve sustainable growth and jobs in European regions. New products and services elevates the competitiveness of European enterprises and creates new jobs (European Commission 2014).

The new Procurement Directives have made the legal framework more innovation-friendly. And EU programs such as Horizon 2020 offer funding opportunities for public procurement of innovative solutions (European Commission 2014).

3.5.1 What has been done to support PPI in Europe?

There have been several steps put in place to support PPI in Europe.

Measures to reduce the financial risks of public procurement of innovative solutions (PPI).

Measures to improve the skills of procurement officers, such as a web platform to exchange best practices and experiences.

Improvement of the evidence base, such as measuring public procurement of innovative solutions (PPI).

New Public Procurement Directives. The new directives will encourage companies to develop their capacity for innovation, while maintaining the basic requirements of competition, transparency, and equal treatment (European Commission 2014).

3.5.2 Horizon 2020

Horizon 2020 is the world's largest research and innovation program with 80 billion euros spread over seven years. It is the financial instrument implementing the Innovation Union – a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness. Horizon 2020 foresees several different types of support to public procurement of innovative solutions (European Commission 2014).

The European Union's Guidebook Series - How to support SME Policy from Structural Funds - Public Procurement as a Driver of Innovation in SMEs and Public Services states that:

National policy-makers can apply the same instruments to support public procurement of innovative solutions as the European Commission does at EU level with three main approaches:

1. **Sharing the risk of innovation procurement:** financial support to public purchasers.
2. **Guidance** to procurement bodies on how to procure innovative solutions.
3. **Indirect support for the administrative capacities** of procurement officers: Elevation of skills (European Commission 2014).

3.5.3 Elements that stimulate PPI most according to the European commission

The European commission states that the following Current practices stimulating the most PPI.

- Awarding of contract based on the Economically Most Advantageous Tender.
- Functional requirements in procurement.
- Acceptance of alternatives.
- Use of standards.
- Use of life-cycle costing.
- 'Best available technology' clause.
- Forward commitment procurement (European Commission 2014).

3.5.4 Norwegian research council and Horizon 2020

Norwegian companies and research communities can participate in Horizon 2020 along with colleagues and competitors in other European countries (Research Council 2018a).

The Research Council has several instruments that will help strengthen Norwegian participation in Horizon 2020. The applicants can get financial support to find partners, networks, and relevant announcements, and applicants can get support for writing applications. The Research Council also provide additional funding to participate in projects, and to participate in forums that set the agenda for future thematic announcements. (Research Council 2018b) Norwegian participation in Horizon 2020 contracts for the Norwegian counties and municipalities can be seen in the picture below. The darker the shade of color the more funding from Horizon 2020 has been given to that particular region (Public.tableau.com 2018).



Figure 4: Financial support from Horizon 2020 by region (Public.tableau.com 2018)

The total funding in million EUR that has been received is listed in the figure below (Public.tableau.com 2018).

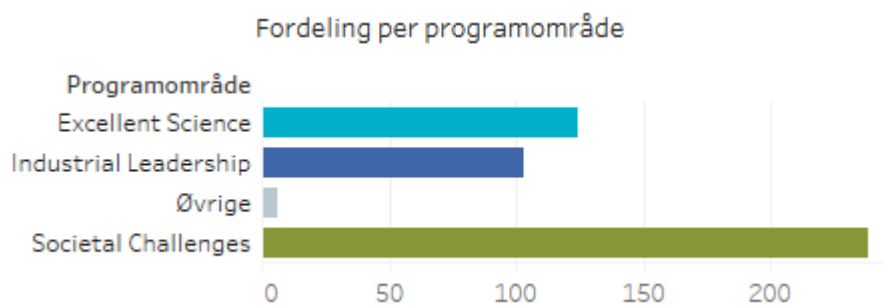


Figure 5: Financial support from Horizon 2020 by program area (Public.tableau.com 2018)

3.6 Barriers for innovation from public procurement

There have been several articles on possible barriers for innovation in public procurement. One of them being Uyarra et al. (2014) that focuses on barriers for innovation from the supplier side of view in the UK. The following is a summary of such barriers

The Procurement capabilities. If you compare procurement of innovative solutions to easier to purchase items, such as off-the-shelf goods or standardized services, there is a greater need for competence regarding the purchaser when procuring innovative solutions. Shortcomings regarding commercial skills among public purchasers are commonly found to be a limitation and challenge when it comes to innovative procurement.

Management of risks associated with procuring innovations. In public procurement risk aversion is common. And this is a strong barrier toward public procurement of innovative solutions. Decision making in the public sector is affected by strong legal regulations regarding transparency and accountability.

Low buyer–supplier interaction. The relationship and communication between public purchasers and suppliers can be constrained by lack of skills, risk aversion, or again the strong legal regulations that makes this difficult.

Public demand for innovation. The theory is that if the suppliers in the market regard the public as an intelligent or demanding customer they will step up and be innovative to be able to serve this customer. But if there is not enough incentives or actual demand for innovative solutions this can also be a strong barrier to public procurement of innovation.

Tender specifications. Another barrier for innovation can come from the nature of the tender specifications. It is rare with specifications that focuses on outcomes or performance, and these are regarded as to be better to make the market come up with innovative solutions. But when the public purchasers make specifications to rigid and narrow, that rigidity is a barrier for innovation in the market.

Incentives for the supply of innovative solutions. Even if the public sector has a demand for innovation, the right incentives may not be in place yet for that innovation to be realized.

Access to tenders and other process related constraints. There is also a focus in public procurement to use large and bundled contracts that smaller companies can't deliver upon. Complex tendering processes that smaller companies don't have the commercial skills to deliver upon, and the structure of public tendering and particularly the use of selection criteria regarding supplier size or experience may also lead to the blocking of smaller companies. And when the smaller companies are not able to be in play, there is a challenge that the innovative power they have is lost.

In sum, Uyarra, et al. (2014) found five main barriers and challenges. Firstly, the use of over-specified tenders as opposed to outcome-based specifications. Secondly, low competences of purchasers and poor management of risk. Thirdly, difficulties for participation in the tender competitions because of pre-qualification procedures and conditions. Fourthly, lack of feedback to unsuccessful tenders. Lastly, the public agencies' low appreciation of unsolicited ideas.

Another study by Edler and Yeow (2013) about intermediation in public procurement focused more on the general barriers. It identifies the following four factors as the most important to address according to earlier studies from several researchers such as (Edler et al. 2005) (Edler and Gee, 2013) (Tsipouri et al. 2009; Wilkinson et al., 2006) and (Kyratsiset al. 2010; Rolfstam et al., 2011; Rye and Kimberly, 2007). Firstly, understanding and assessing the market and its opportunities. Regarding what is already offered in the market, and what the market could possibly deliver if asked for. Secondly, being able to understand need, and the functional improvements that is possible through innovation. Thirdly, the use of incentive structures that reflect the risk involved aiming for innovative procurement. This is to ensure that those organizational units that bears the risk, also share some of the efficiency or reputational gains that are associated with innovation. Lastly, being able to implement the innovation and change the organizational procedures, the routines and the actual capacities that are needed to do so (Edler and Yeow 2013).

3.7 Role of attitude

An attitude is a disposition to respond positively or negatively towards something. This something can be another person, object, institution, event, or almost everything in life (Ajzen 2005).

The most common perception is that attitude guides, influence, directs, shapes or predicts actual human behavior. An analysis by Kraus (1995) concludes solidly that this is a fact stating that attitudes significantly and substantially predicts future behavior (Kraus 1995).

Research regarding consumers decisions such as which ads to read, where to shop, and so forth are largely based on attitudes. The studies conclude that to have an influence on the actual decision making of the customer, and their behavior, people in marketing needs to change consumers attitudes to get the desired outcome (Hoyer, MacInnis and Pieters 2013).

But even if it is more or less agreed that there is a relationship between attitude and behavior, some studies have put forward arguments stating that this is a fact expected only under certain circumstances. They suggest that the strength of the relationship between attitude and behavior is moderated by other factors related to the person performing the behavior. Thus, one should understand that influencing attitude is important but there are also other factors to take into consideration that has an effect on the individual's actions (Ajzen 2005).

3.7.1 Changing the attitudes of public purchasers towards PPI

The public purchasers are according to the literature too risk averse. So, in order for the public sector to be more focused on innovation, attitudes as described in the section above is relevant. But also change management will be an important factor to take into consideration when trying to aim for better success with implementation of PPI.

Martinsen (2004) states that to manage change processes is one of the most important but also one of the hardest management tasks. And for some academics this is the essence of management, and everything else is second tire.

There are several reasons why change is difficult. The lack of trust towards the person or agency that propose the change that needs to be made, from the perception of the people that needs to carry out the change. The lack of ability to understand that change is needed. The lack

of ability to perceive that the changes actually can be done. And doubt that the benefits justifies the costs. These barriers among others are to be regarded as a normal defense mechanism. (Martinsen 2004).

To get people or organizations involved, and to believe in the change, there needs to be a vision that puts forward a better future situation than the current status. This vision needs to be appealing to different sorts of people and organizations, that has some sort of common values and ideals that every stakeholder finds appealing. In order to make political change some tools can be to create coalitions that support the change, and to assemble groups or organizations to govern the change with key people to fill important positions (Martinsen 2004).

There are several theory's on how to change attitudes. And one of these are cognitive dissonance theory by Festinger (1957). Cognitive dissonance refers to a situation involving conflicting attitudes, beliefs or behaviors. This produces a feeling of discomfort leading to an alteration in one of the attitudes, beliefs or behaviors to reduce the discomfort and restore balance, etc. (Festinger 1957).

For example, when people smoke, and they know that smoking causes cancer, they are in a state of cognitive dissonance. Cognitive dissonance theory (Festinger 1957) suggests that we have an inner drive to hold all our attitudes and behavior in harmony and avoid disharmony. This is known as the principle of cognitive consistency. When there is an inconsistency between attitudes or behaviors (dissonance), something must change to eliminate the dissonance (McLeod 2014).

One way to reduce the dissonant is to acquire new information that outweighs the dissonant beliefs. For example, thinking smoking causes lung cancer will cause dissonance if a person smoke. However, new information such as "research has not proved definitely that smoking causes lung cancer" may reduce the dissonance, and thus changing the attitudes (McLeod 2014).

To sum up, this chapter has reviewed key aspects related to objective and research questions of the study. It is important to note that extant literature on public procurement, and in particular PPI, is rather scarce, which limits more extensive and thick literature review on the subject.

CHAPTER 4

Research method, research design, and data collection

4.1 Introduction of the chapter

In this section the design, target audience, data collection, and data analysis procedures will be discussed. The starting point for choice of design was the matrix from (Burrell og Morgan 1979) that is described in the next section.

4.2 Choice of design

For the study the matrix from (Burrell og Morgan 1979) was used as a guiding tool to be able to choose the appropriate design for the research. The matrix is presented below.

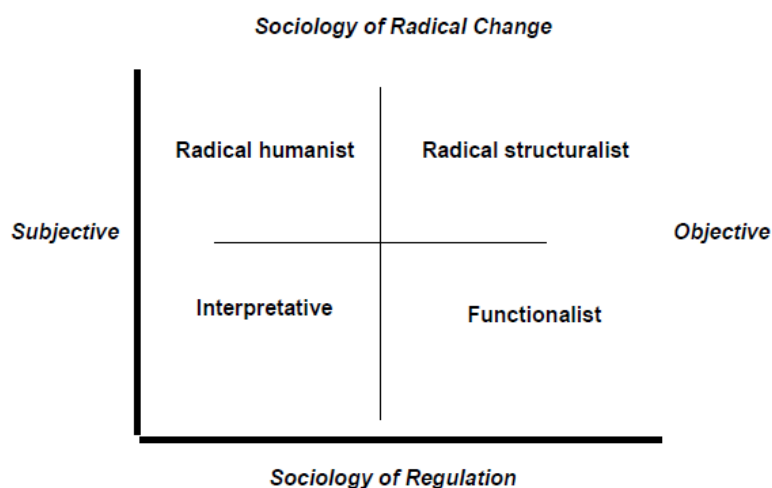


Figure 6: Sociological Paradigms by Burrell & Morgan (Burrell og Morgan 1979)

The four paradigms represented by the matrix are well known, and they will not be elaborated on other than the chosen design below.

4.3 Research method and design for thesis

A mixed method approach was used. And the methods and analysis will be presented in two different chapters of this thesis.

Because of the nature of the problem statement and the classification from (Burrell og Morgan 1979) the study begins with the interpretive paradigm using exploratory case study design. This

is because the study first seeks explanations based on the experiences of the participants. Due to limited scholarly work on the subject, it was deemed necessary to conduct an explorative study which would provide a better understanding of the subject matter.

The study then moved on to the use of explanatory design from within the functionalist paradigm whereby data on predefined variables are collected and analyzed to determine relationships between variables of interest. This is because the study seeks to provide essentially rational explanations of social affairs. Thus, the study seeks to understand society in a way which generates knowledge which can be put to use. The study has a problem-orientated approach and is concerned to provide a practical guidance to a practical problem (Burrell og Morgan 1979). The analysis in this study was conducted through partial least squares (PLS) path modeling, a composite-based form of structural equation modeling (SEM) that in recent years has been increasingly used by researchers.

Since the unit of analysis for both research approaches is the public purchasers, a good starting point to reach out to possible informants for the case studies was to make use of the lists of finished and active innovative public procurements on the Norwegian webpage for Innovative procurements. This would allow identifying informants both from more leading entities and less experienced entities according to Menon Economics research. (innovative procurement 2017a). Eventually, the informants for the interviews and survey where selected more or less random, and representatives from the Norwegian National program for supplier development also gave feedback that the informants for the interviews where representative of the two different groups according to their definitions. They also gave some information about possible informants in the more experienced group so there was somewhat of a snowball method involved in getting informants.

4.4 Explorative case studies

As noted earlier, the study started with qualitative research using explorative design. Following case study design guidelines, interviews were carried out with Norwegian public purchasers to gain knowledge about the purchaser's views to elaborate on the knowledge from the *first* literature review.

Case studies in short involves gathering as much information as possible about a defined issue, and according to Yin (2009) there are five important components when performing case studies:

- 1: The case study should start with a problem statement that has its root in a practice. Then the researcher should define research questions that focuses on this problem statement.
- 2: The next phase is that the researcher makes some assumptions about the issue, and it is these assumptions that makes way for the finished problem statement.
- 3: When the problem statement is in place, the next issue is to define the entities of analysis.
- 4: Then there needs to be defined if the study is based on theoretic assumptions or a describing study. And this study is based on theoretic assumptions from the literature.
- 5: How to interpret the findings from the case studies. In this study it will be interpreted according to relevant literature (Johannessen, Christoffersen and Tufte 2011).

Note: In this study literature review was carried out at separate points during the period of writing the thesis. *First* there was a major literature review that was carried out before all the data collection was carried out. *Second* there was literature review after the case studies was analyzed to some extent as the researcher wanted to know more about some interesting elements mentioned from the informants. *Third* there was also some literature review at the end to try to get even more knowledge about what has been documented earlier in regards of the thesis results.

4.4.1 Explorative design and interviews

Explorative design and interviews are suitable when the individual's personal experience is of key interest. The exploratory qualitative research interview is a conversation with a predefined structure and goal. The structure is connected to the roles between the participants of the interview. The goal is often to understand or describe something. Interviews are suitable when the researcher aims to give the informants more freedom to express them self than a survey does, and the purchasers views will also be easier to address when the informant can be able to choose to some degree what will be addressed during the interview. The researchers registering, and analysis of the interviews, will be the data collected for research (Johannessen, Christoffersen and Tufte 2011).

There are some obvious reasons to collect data using qualitative methods and interviews. Some of these are the need to give the informant bigger freedom to express themselves than a predefined survey does. Some problems are also quite complex, and the qualitative interview makes it possible to get more data on the complexity and the different shades of the problem than a predefined survey does. The data collected from the qualitative interview can also be used as a supplementing method to conclude on the problem statement or view it under a different point of view (Johannessen, Christoffersen and Tufte 2011).

The qualitative interview can be structured in different ways. Two extremes are *unstructured interviews* and *totally structured interviews*. In the unstructured interviews it is only a topic that is predefined, but the questions are totally open, and flexible to each new interview. The totally structured interviews are totally fixed more like a survey with predefined question alternatives. But it has not predefined answer alternatives like the survey, so the interview subject has to come up with own answers to the totally predefined questions, so the researcher gets more in-depth answers than with a survey. In the middle of these two extremes are the *semi structured interviews*. The semi structured interview has a masterplan called an interview guide as a guideline for the interview. The interview guide is not a questionnaire, but a list of topics, and general questions that will be addressed. The topics in the guide is based on the problem statement and research questions. This way the researcher has a more planned out roadmap for the interview, but it is not totally fixed such as the totally structured interviews, so the researcher can in the interview situation move back and forward through the interview guide according to what suits best in the current situation. The researcher can also if needed vary both the questions and topics if this is suitable, but the more accurately the researcher follows the guide, the easier it will be to make comparisons between other interviews carried out with the same interview guide (Johannessen, Christoffersen and Tufte 2011).

The interview guide needs to have several important parts in order to be professional and useful. The interview also need to be carried out in a professional way. The interview guide should start off with simple questions about facts. Such as nature of the company or public agency, simple facts about the informant and so forth. Then there should be some introduction questions to introduce the research subject, the aim of this is to focus the informant on the relevant subject and elaborate on the informant's own experience and views on the subject. Then there should be the main part with the key questions and most of the time during the interview should be used on this part. The focus of the main part is for the researcher to get the

information he needs to get knowledge about the problem statement and research questions. When the main part is coming to an end the researcher should close the interview in a heads up that there are just a few more questions left, and at the end of the interview there needs to be time to address additional questions that the informant or researcher might have before wrapping up the interview. When starting the interview, it is important for the researcher to present himself. The researcher must also elaborate on the study in with the interview is relevant to, and which topics that are going to be addressed, and what will happen with the data. Other important elements to address in the start of the interview are how the interview will be recorded and documented, assurance of anonymity if this is important for the informant, the informant's possibility to abort the interview at any time, and the length of the interview (Johannessen, Christoffersen and Tufte 2011).

4.4.2 Selection of case organizations and the informants

In total, 6 informants were selected for the interviews, 3 from public organizations that had already implemented PPI and are regarded as among the most experienced in the field, and 3 that had not implemented it totally, but had some knowledge about it. Following (Eisenhardt and Graebner 2007) the six informants were selected in two categories through theoretical sampling. That is, the informants were selected due to their potential to illuminate aspects of PPI and indicate relationships between variables. By doing this the study could explore both the experienced and the unexperienced public purchasers and thereby draw implications regarding Norwegian public purchasers. Thus, the 3 informants that had implemented PPI were selected on the basis of what the Menon Economics midway evaluation (Menon economics 2017) defined as experienced and mature organizations regarding PPI as elaborated on earlier. The other less experienced ones were selected on the basis of what the Menon economics midway evaluation defines as unexperienced organizations regarding PPI and so called them "following municipalities" that tag along when the more experienced entity leads a larger innovative procurement process.

The 6 informants also come from different cities and parts of Norway. To confirm the validity of the grouping of the six informants, the researcher contacted representatives behind the Norwegian national program for supplier development. They confirmed that the grouping of the organizations was correct according to who they regarded as experienced and less experienced. . They also stated that they defined the experience of the entities "according to

how many innovative public procurements the entities have carried out, and whether or not they have anchored innovative procurement in their strategies". Furthermore, they also stated that "the 3 informants that I had from the less experienced group was not totally inexperienced with PPI. They were more or less medium or (in the middle of the tree) according to their definitions".

Subsequently, a separate e-mail invitation with information about the study and interview procedures was distributed to potential informants. There were no real difficulties in finding informants, but it was more challenging to find informants among the less experienced entities than among the more experienced entities. After 6 different informants had volunteered to act as informants for the study, a second email with more information and possible dates for the interviews was e-mailed to all the informants in separate.

An interview guide was prepared with the aid of the supervisor for this thesis. The guide started with several simple questions for the informants. Such as number of years working with public procurement and so forth. These were followed by one set of open questions for the most experienced informants that had implemented PPI with success, and then another set of open questions for the ones that had less experience with PPI. And there was also made several follow up questions for both groups that was used regarding barriers and critical success factors from the literature review that was used if the informants had not touched upon these subjects during the main part of the interview.

From the exploratory interviews, the aim was to gain further insight, and from this more accurate survey questions relevant to the Norwegian public purchasers could be made to assess the research questions. All six interviews were carried out by SKYPE or telephone in Norwegian, and the sound was recorded for the purpose of text transcription by two different data carriers (laptop and iPad). For the transcription google docs and voice recognition was used. The researcher had the Norwegian recordings of the interviews on headphones and then spoke out loud verbally while google docs then transcribed the interviews to text by voice recognition.

When the six interviews had been transcribed they summed up to about **16.000 words** for just the main part and some follow up questions. The start of each interview, and also the end was pretty much just straight forward describing the study and saying thanks for their time, so this

part was not transcribed. The transcriptions were then analyzed according to category-based division of the data (Johannessen, Christoffersen and Tufte 2011). The interview guide functioned as a guidance to the different categories of data, and all of the information in regard to each question was sorted and analyzed within their category and question in an excel spreadsheet. When analyzing the interviews, the researcher was most interested in the words, and less on what sort of language and tone that was used to describe the issues. Mostly the researcher concentrated on the pure literal form of the transcribed interviews (Johannessen, Christoffersen and Tufte 2011).

Below is a small example of the categorization for the less experienced group.

Table 1: Example of categorization of interview statements (less experienced group)

Informant	1	2	3
Spørsmål 1: Hva er grunnlaget for at dere ikke har implementert Innovative Offentlige Anskaffelser i full grad hittil?	Det er basert på kunnskap om hvordan faktisk å gjøre det, og at det faktisk tar tid. Å gjøre en innovativ anskaffelse tar mye mer tid.	Da kan vi jo gå rett til beslutningstakernes evne til å godta risiko. Innovasjon innebærer risiko å anskaffe i seg selv. Og det er jo nettopp dette med å ha rammer som tillater dette.	Men så er jo det dette når man gjør en innovativ anskaffelse så kan det for noen virke litt sånn skummelt tror jeg, eller kanskje de har opplevd det litt sånn ute når de prøver å få med folk.

The same was also done for the more experienced group as can be seen below on the next page.

Table 2: Example of categorization of interview statements (more experienced group)

Informant	1	2	3
<p>Spørsmål 1: Hva var drivkraften til at din organisasjon ønsket å implementere Innovative Offentlige Anskaffelser?</p>	<p>Det var et ønske om å utnytte det mulighetsrommet som faktisk lå der, samtidig som det var en konkret anskaffelse der man faktisk trengte en ny løsning.</p>	<p>Du kan si at det var både et ønske om å anskaffe mer fremtidsrettet i vårt lille anskaffelsesmiljø i kommunen, og det var en rekke strategidokumenter i kommunen som pekte på innovasjon.</p>	<p><i>This informant did not give any statements regarding this issue due to the fact that the informant was not employed when they implemented PPI.</i></p>

CHAPTER 5

Analysis of explorative case studies

5.1 Introduction of the chapter

In the following section the key quotes and findings from the case studies are presented. As mentioned before the transcription of the six interviews summed up to over **16.000 written words** for just the main part and some follow up questions to assess certain elements from the literature. The thesis document you are reading now is in comparison about 32.000 words on its own. The key statements were then categorized in an excel spreadsheet for each question, with statements from informant 1, 2, and 3 from the less experienced group. And the same was done for the experienced group. This made it possible to compare statements, and also to draw parallels between the groupings. Transcription was made a lot easier and quicker by the usage of google voice typing, and the categorization in excel made it a lot easier to find similarities and other important factors.

The goal was to be able to use findings from the case studies to make a better survey. The case studies functioned as an information pool for the surveys in addition to the questions adjusted from earlier mentioned literature. In order to keep the statements as close to its original stated form as possible the quotes will be put forward in Norwegian.

5.2 Key findings from the case studies

5.2.1 Drivers

To assess the drivers for implementing PPI there was put forward questions towards the more experienced group to capture this. There was made several interesting statements but in sum they all focused on capturing the possibilities that was present to solve their needs by capturing the innovative powers that suppliers can put forward when they are given the possibility to put forward their best possible solution. There was also pretty much a commonality between the more experienced group that they wanted to be sure they got the solutions for the future, and not the solutions of yesterday. The following quotes shows this in a good way.

Det var et ønske om å utnytte det mulighetsrommet som faktisk lå der, samtidig som det var en konkret anskaffelse der man faktisk trengte en ny løsning, og da så man at dette var en god metode å bruke

Du kan si at det var både et ønske om å anskaffe mer fremtidsrettet i vårt lille anskaffelsesmiljø i kommunen, og det var en rekke strategidokumenter i kommunen som pekte på innovasjon som en nødvendighet og som noe vi er nødt til å forholde oss til

The two drivers above are not that surprising. They fit well with earlier mentioned literature that arguments that there is a possibility to attain innovation from the suppliers if done correctly. (van Weele 2012) And also, the fact that the strategic anchoring in the strategy documents was important (Menon Economics 2016).

5.2.2 Barriers

To capture the possible differences and also the possible similarities between the two different groupings there was given the same question regarding barriers for the less experienced group and the more experienced group. There were several similarities between the groups but when the more experienced group put forward similar issues as the less experienced group they also stated that now this was not an issue for them. But it was something they had to overcome by just carrying out more and more innovative purchases to get more comfortable with the method.

5.2.2.1 Barriers from the less experienced groups point of view

The first quote is something that is described in the literature as a barrier. The suppliers regard the lack of knowledge shown by the public purchasers as a barrier for them to innovate (Uyarra, et al. 2014). But, in the same quote it is also put emphasis on the extra time it takes to carry out the PPI process compared to more traditional purchasing.

“Kunnskap om hvordan faktisk å gjøre det og at det faktisk tar lenger tid.
Å gjøre en innovativ anskaffelse tar veldig mye mer tid”

There was a similarity between the informants that there seemed to be mixed attitudes towards the issue of PPI, and if all the extra efforts involved in the PPI process was worth all the extra work. The share lack of knowledge and training in PPI among the purchasers are put forward as

barriers in several studies such as (Uyarra, et al. 2014) and (Edler and Yeow 2013). There was also in the case studies statements that could be regarded as some purchaser's attitudes towards PPI, and as described in the literature on attitudes if they are not positive towards the issue at hand it can lead to the fact that they will not change their actual behavior towards the issue (Ajzen 2005) (Hoyer, MacInnis and Pieters 2013). And the next two quotes highlight that this is actually an issue regarded as a barrier from the informants in the study also.

“Når man skal gjøre en innovativ anskaffelse så kan det for noen virke litt sånn skummelt tror jeg, eller kanskje de har opplevd litt sånn ute når de har prøvd å få med folk”

“De fleste innkjøpene skjønner ikke alle begrepene engang som blir brukt av leverandørutviklingsprogrammet på innovative anskaffelser, hvor det er ekstremt mye metodeverk som sier at du må gjøre det sånn og sånn, og jeg tror folk blir litt sånn matte”

The interviews also shed light directly on the first research question about why public purchasers in Norway continue to focus on a risk-averse approach to procurement with several statements like the following. This is also something that has been put forward in the literature, that states that if there is not leader involvement and strategic anchoring for PPI then the purchasers will be more risk averse due to the fact that it is riskier to aim for innovation than to just buy a well-known product or service that has an existing track record. So, it is not that surprising (Caloghirou, Protogerou og Panagiotopoulos 2015).

“Da kan jo vi gå rett til beslutningstakernes evne til å godta risiko. Innovasjon innebærer risiko å anskaffe i seg selv, og det er jo nettopp dette med å ha rammer som tillater dette”

5.2.2.2 Barriers from the experienced group point of view

The issue about the extra time that it takes to carry out the PPI process was also mentioned by the more experienced group of informants. So, from the case studies it seems to be appropriate to assess in the surveys if this is something that is common for all purchasers. The next quote highlighted this.

“En annen hindring selvfølgelig er tidsaspektet og muligheten for å bruke tid på dette. Fordi at man kan ikke stikke under en stol at både når man lære seg teknikken, og man anvender den de første gangene, så tar det ganske lang tid”

One of the informants in the most experienced group also put forward a statement regarding decentralized procurement in his organization. And that this was a great barrier for innovation in his organization with the following quote.

“En av de største hindringene som vi har av egen erfaring, og kan peke på er desentralisert anskaffelsesansvar. Altså anskaffelsene i organisasjonen er desentralisert og ikke sentralisert hvor da enkelte enhetsledere til og med personer i enhetene gjennomføre en anskaffelse i stor grad, og lite er sentralisert. De vil ofte gå til de leverandørene de kjenner, de vil ofte beskrive og etterspørre de produktene og varene og tjenestene som de kjenner, og vil egentlig drepe innovasjonspotensialet med dette”

This was also one extra element that the researcher wanted to incorporate in the surveys to also address if this was regarded as a barrier by other public purchasers. To the researcher's surprise when the survey was published one of the recipients of the e-mail invitation for the survey that actually was involved in purchasing in the same municipality as the informant that gave the statement above sent an e-mail directly stating the following.

“Hei. Beklager, men vi har ikke erfaring med innovative anskaffelser”

And again, this shows that the lack of knowledge about PPI is a great barrier.

The next quote was something that was put forward by the informants when addressing issues about the definition of the need and involving the users when defining it. If the need is not described in a good way with good user involvement this can be a great barrier for innovation. This is also something that is put forward in literature as a possible barrier (Edler and Yeow 2013).

“Det er ikke vits å kjøpe noe når ingen forstår hvorfor de skal bruke det. Eller hvordan de skal bruke det. Det er veldig mange ting som ikke blir brukt etter intensjonen”

An interesting statement that was put forward by one of the most experienced purchasers was that when they had according to their own references a good knowledge of the current market for the product or service they were tendering they did not put effort into having a dialog. They did not use a dialog in this situation. And this seems reasonable. But the researcher will argue that this can be a possible barrier for innovation also, as there were other experienced informants that put forward something quite opposite. The next two quotes show this in a good manner.

“Det finnes anskaffelser hvor vi ikke gjennomfører en strukturert prosess med tanke på markedsdialog. Det har også noe med det å gjøre at når vi kjenner markedet veldig godt”

“Det er også viktig å frigjøre seg fra historien, det er viktig å ikke basere anskaffelsen på masse gamle antakelser”

The issue of economic incentives for risk mitigation also came up in the interviews. The informants pretty much all agreed that they were important as some of the projects that they had been involved in would most likely not be a reality if it were not for the economic aid from programs such as Horizon 2020. But surprisingly several of the informants more or less instantly went on to state that there where extreme applying and reporting procedures involved in these incentives. And that this actually was a barrier. So, for me as a researcher it was an issue if I should put this information in terms of success factors or barriers, because it seems to be both. The following two quotes highlight this. This is also an issue in earlier research in Norway (Analysis & Strategy and Oslo Economics 2015) (Menon Economics 2016).

“Horizon 2020 er et program som er fantastisk og som er stinn av penger. Problemet med den er rett og slett rapporterings byrden som man bli pålagt ved å gå inn i et slikt prosjekt”

“Så finnes det en masse eksterne finansieringsmuligheter for eksempel. Utfordringen med dem er jo at da er man inni et slikt søknadsregime fort”

5.2.3 Critical success factors

There was also asked questions regarding what the purchasers perceived as critical success factors to achieve success with the implementation of PPI. And several interesting statements were made, and there was a good indication that they all put forward a lot of the same issues regarding this. And they also put forward statements that mitigates some of the earlier mentioned barriers.

Some statements went directly to the issue about getting more experience with the PPI process and that this could make the purchaser more positive towards PPI. Two good statements to highlight this is the following. This is also mentioned as important in earlier studies such as (Menon economics 2017).

“Så tenker jeg at det er en suksess faktor å selvfølgelig å bli kjent med rammene for det slik at det blir trygt og greit å gjennomføre. Gjøre det til noe vanlig. Prøve å operasjonalisere hvordan man kan jobbe for å få det til”

“Det at man faktisk kaster seg ut i det og prøver det ut og gjør seg sine erfaringer, at man ikke holder igjen og venter til at andre gjør. Men å gjøre sine egne erfaringer”

When addressing the issue with functional demands and that this is a key element in success with PPI the purchasers pretty much all agreed that this was the case. And this was not surprising as it is mentioned as important by different sources such as (DIFI 2017b). But they also put forward that they could not always give the supplier full freedom with the solutions, because sometimes they needed it to fit with something else that they already had in place. For instance, a computer system. The following statement shows this in a good way.

“Kommer an på anskaffelses art, for eksempel hvis noe skal passe sammen med noe vi har fra før så må vi spesifisere. Men innenfor standardisering og nye rammeavtaler så er svaret helt klart ja.”

It was also mentioned that the new law and regulations were friendlier in terms of innovation and thus dialog with suppliers. And this is put forward as a measure for success by (European Commission 2014) As it now is more detailed in the regulation when and how to use dialog. The statement below give reference to the Norwegian regulations for public procurement § 13-1,

13-2, 12-1 and § 12-2 that defines the dialog both before and after the tender competition has started. This is also mentioned in (Norwegian Guidebook for Public Procurement Regulations 2017).

“Med det nye regelverket så er det godt spesifisert at dette faktisk er lov, og det er liksom mer eksempler på hva man skal gjøre, og man oppfordres til å gjøre det. Det tror jeg er bra, for jeg tror mange har vært litt sånn redd rett og slett for å gjøre det”

But some interviewees also made comments regarding how to carry out the dialog with suppliers. These comments were interesting as the researcher has been in some dialog meetings with public purchasers himself.

I starten så gjennomførte vi dialogkonferanse hvor alle leverandører kunne melde sin interesse og hvor vi samlet de alle og så fortalte vi hvilke behov vi hadde også kunne de gå hjem og tenke over dette og hvordan de kunne dekke det. Vi har gått bort i fra det nesten fullstendig med noen få unntak, med unntak av de helt store anskaffelsesprosessene så ser vi mye mer nytte i en til prosesser. Altså at vi snakker med en leverandør for seg selv. Du får en leverandør som er mye mer avslappet som ikke må holde kortene tett til brystet på grunn av at konkurrentene sitter i salen.

The statement above shows that even though dialog is important, it is important to do it correctly in order to not ruin the supplier's willingness to innovate. If this is the case, then the dialog can suddenly become a barrier. But if it is done correctly it can be a success factor both from the supplier's point of view, and also the users.

“Bare det med å ha dialog med leverandørene tror jeg oppfattes veldig positivt av leverandørene, samt de ansatte i kommunen som har vært involvert i prosessene. Og det at vi i prosessen nå må være aktive også i forhold til behovsforståelse”

There was also mentioned facts that can mitigate the barrier with the extra time it takes focusing on the PPI process. A good statement for this can be seen below.

“I enkelte konkurranser men det er nokså begrenset, har vi fått en færre innsynskrav og klager i forhold til meddelelse av kontrakt for det at vi har vært i en god og transparent dialog i forkant. Og der har vi kanskje spart inn litt av den ekstra tiden en slik prosess tar”

There was also from the more experienced group mentioned that they now used the PPI process at different scales even for more ordinary purchases. This is something that be a great success factor for PPI because of the fact that the more the method is used, the larger the evidences of its success becomes. The strengthening of the evidence base is also important according to (European Commision 2014). And it is stated that this can strengthen the prospects of PPI. A good statement for this can be seen below.

“Vi prøver å være bevist på bruken av metodikken også i ordinære prosesser. Vi har kalt det for kunnskapsbaserte anskaffelser, for å da ikke kalle det for innovasjon når det kanskje muligens ikke er det”

The most commonly mentioned element from the informants was that if there was anchoring for PPI in management then it was much more desirable for them to aim for PPI. This is not surprising as a lot of earlier research has stated this such as (Analysis & Strategy and Oslo Economics 2015) (Menon Economics 2016). The following statements really puts emphasis on this fact.

“Og så tror jeg at både hos saksbehandler altså de som gjennomfører anskaffelser men ikke minst at ledelsen har forankret en tanke om at vi ønsker å anskaffe fremtidsrettede løsninger og ikke gårtdagens løsninger eller dagens løsninger som er utdatert i morgen”

“Forankret en tanke om at vi ønsker å anskaffe fremtidsrettede løsninger og ikke gårtdagens løsninger, eller dagens løsninger som er utdatert i morgen”

“Sørg for å få det forankret både i strategiske dokumenter og i de øverste administrative og politiske ledelse. Det er kjempeviktig at man har noen som ønsker at man drar i den retningen som man drar i”

As mentioned in the section regarding barriers it is both put forward in literature (Edler and Yeow 2013) and from the case studies that it is a barrier if the users don't use the innovation as intended. But if this is done correctly is can be a great element for success as the following statements shows.

“Hvis man skal kjøpe mer komplekse ting som er kanskje nytt, og som kan være litt skummelt så er det bra vi har denne involveringen, for hvis du involverer i anskaffelsen så blir det en kritisk plussfaktor i innføringen. For da vet man faktisk at dette vil komme også”

“Vi har et helt annet fokus på behov. Og det tror vi at også styrker muligheten til å faktisk løse behovene og ta i bruk ting etter intensjonen”

5.2.4 Outcomes of successful implementation of PPI

Questions were also asked regarding what the most experienced group regarded as their outcomes of successful implementation of PPI. And the two following statements sums this up in a good way. And the outcomes and results of PPI that are in regards of the projects the purchasers are referring to is made available for all stakeholder at evidence that PPI gives results on the Norwegian webpage www.innovativeanskaffelser.no. And strengthening such evidence base's is an aim of the Norwegian government and also the EU as mentioned in the literature review (Ministry of Trade and Industry 2013) (European Commission 2014).

“Sparte veldig mye penger på selve investeringskostnadene som ville ha fulgt hvis vi skulle gjort det på den måten som markedssituasjonen ellers tilsa. Da skulle vi ha byttet ut masse datasystemer, men der sparte vi mange millioner på grunn av dialogen”

“Vi har for eksempel kjøpt nytt signalanlegg på et sykehjem, og det er bare vite at det du kjøper er up to date når du kjøper det, og at ikke du kjøper det anlegget som var passert for 5 år siden som du kanskje hadde gjort hvis du spesifisert detaljene uten å snakke med markedet”

5.3 Summary of the six case studies

Most of the statements above were put forward in different ways by several informants as elaborated on in the sections above and sums up the key findings from the case studies that also is elaborated on in the survey and the final discussion for the thesis.

5.3.1 Drivers

The most mentioned drivers mentioned in the case studies are the possibilities of attaining better satisfaction of the actual need when giving the suppliers the possibility to use their innovative powers. And the focus on purchasing the most cutting-edge solutions for the need, and not be in a position where the purchase is actually yesterday's solution, or at best today's solution that can be outdated tomorrow.

5.3.2 Barriers

The most mentioned barriers in the case studies are the risk involved in aiming for innovation, and the lack of knowledge on how to carry out an innovative public procurement process. There is also put emphasis on the fact that economic incentives are important when aiming for innovation because of the risk mitigation, but the applying and reporting for the incentives are so extensive that they can be somewhat of a barrier on their own.

5.3.3 Success Factors

In regard of the most mentioned success factors the statement that is pretty much put forward by all informants is the fact that it needs to be leader involvement and strategic anchoring for PPI in order for the purchasers to actually be willing to take the extra risk aiming for innovation. In regards of the leader involvement one of the informants also stated that it was important to put forward the vision of being able to acquire the solutions of the future, and not yesterday's solutions, or today's solutions that might be outdated tomorrow. In order for the purchasers to be more familiar with the PPI process several informants from the more experienced group put forward that it was important to just try it out and get more experience with the process. And they also state that it is really important with more PPI training in order for the purchasers to get more into the framework for innovative public procurement.

There is also the issue with the economic incentives, they are regarded as important. But the issue with applying and reporting puts this somewhat in the middle of barriers and success factors. It seems that if the reporting and applying procedures would be regarded as friendlier the incentives would become much more of a success factor.

5.3.4 Outcomes of successfully implemented PPI

The two most direct stated outcomes of successful implementation of PPI was in regard of actual savings in money by the fact that in the end the purchaser has acquired something else then the first view of the marked suggested. But with the use of dialog and the PPI process they ended up not investing the large amount that they initially had in mind but solved their need in a cheaper and more innovative way. There is also the fact that by the use of the PPI process the purchaser have more confidence that they actually have bought something they feel is the up to date cutting edge solution for their need.

CHAPTER 6

Survey of public purchasers

6.1 Explanatory design

An explanatory design was used to create surveys. Primarily, the six case study interviews enabled to further assess and optimize the research questions to answer the problem statement of the study. The study made own adjustments to questions based on several articles that previously has addressed similar issues such as (Uyarra, et al. 2014) and (Georghiou, et al. 2012). The supervisor for this thesis also gave feedback and adjustments to the survey before distribution. The survey was divided into two parts. *First* questions aimed at capturing attitudes, and *second* questions aimed to assess with simple proportions if the elements put forward by the Norwegian government and DIFI is regarded as critical success factors (DIFI 2017b). Most of the remaining part of the study will be focused on the first part of the survey regarding attitudes.

There are several reasons why surveys with predefined answers and descriptive design are used. Predefined answers and answer-alternatives gives way for a standardization that makes it possible to address similarities and variations. And this standardization then gives the researcher the possibility to generalize the results from the selection of informants, to the population. By using surveys, the researcher can also reach a lot of informants in a short amount of time to get good statistical data and by using statistical analysis the researcher can address similarities between data to conclude on the research questions (Johannessen, Christoffersen and Tufte 2011).

The study used an online survey with the use of www.questback.com, and the surveys was distributed to relevant purchasers that where in a position to be able to assess the questionnaire based upon their experience and power in terms of their roles and positions. The aim was to get as many informants as possible in this stage in order to get good statistics. To find informants that had roles within procurement in the Norwegian municipalities www.doffin.no was used to gather e-mail addresses. The researcher performed searches on www.doffin.no that only had 3 predefined elements. The first two elements were that the Norwegian word for municipality "kommune" was used as search word, and in the filtering options there was only searched for the bigger procurements that is published all over Europe. This way it was easy to just see

procurements that was put forward from both municipality's and counties and also above the thresholds in the Norwegian regulation for public procurement. The researcher also found all the informants in rather new competitions that all were listed in 2017 and 2018 and this was the third predefined element. Then it was a simple task to get hold of the e-mail address to the person behind the purchase because this was listed under contact information on the www.doffin.no listing.

The informants within this group was chosen randomly according to what could be found on www.doffin.no, and the population is all public purchasers in municipalities and counties in Norway. But it was difficult to estimate the total population because of the fact that there are so many people involved in procurement in the municipalities. Not only the ones that actually work in the purchasing departments. Based on the fact that the randomly selected survey informants had published some sort of tender competition on www.doffin.no in the last year or so the researcher find it safe to say that they are in a position to have an opinion on the study subject because of the fact that they are involved in public procurement both after the new EU directive came into play, and also after the new Norwegian law for public procurement came into play and all of the tender competitions was above the threshold values because of the fact that the researcher only made searches that was published all over EU.

6.2 Survey design

Ordinal level questions where used in order to capture the informant's perceptions towards the questions asked. A Likert scale from 1-5 was chosen as this is a common method that is well established in research (Johannessen, Christoffersen and Tufte 2011). There are good and bad characteristics regarding surveys. They are a good way to get data from a lot of informants in a short amount of time, but that does not mean that the data is good and reliable. The questions that the informants need to answer can be interpreted in several different ways by the informants. Therefore, it is not given that the data collected from surveys are any better than the data collected from the interviews. But it allows for standardization and to see if there is a consensus among the public purchasers. The survey also needed to be designed so that it could combined with the interviews answer the research questions more in depth than just one of the options could do on its own (Johannessen, Christoffersen and Tufte 2011).

The foundation of the survey was the problem statement and the research questions. An important fact is to ask concrete question. This makes it easier for the informants to interpret and answer. When creating the survey, it is a good reference to regard what other researchers has asked before in their survey analysis. This way it is possible to borrow questions that has been used before, and also questions from articles has been subject to a lot of testing (Johannessen, Christoffersen and Tufte 2011).

Mainly the aim of this study was to capture the views of the Norwegian purchasers in order to generate insights, so the questions where mainly adjusted according to information from the conducted interviews.

Due to the time restraints of this thesis a pre-study was not conducted in order to check the survey. But the survey was tested and adjusted with the aid of the supervisor for this study.

6.3 Hypotheses

After the qualitative case studies was carried out, and also analyzed to some extent, some similarities were seen in the stated opinions from both the less experienced and also more experienced groupings of purchasers. And this was statements made that could be viewed as the purchaser's attitudes towards PPI and the purchaser's views on the prospects of PPI as can be seen in the results from the case studies. And to be able to further assess if some of the most commonly mentioned elements both in literature and the case studies could possibly have an impact on the purchaser's attitude towards PPI a conceptual model was made that also gave way for the following hypotheses.

Several studies have put stress on the fact that economic incentive arrangements have an impact on success with PPI because the purchasers attitude are that aiming for innovation is somewhat connected to more risk. Studies such as (Edler and Yeow 2013) and (Menon Economics 2016) define that there needs to be in place incentives that provides risk relief for the purchasers as they are risk averse. Therefore, there is most likely a positive effect of more available economic incentive structures. So, the first hypothesis is then.

H1: More economic incentive arrangements make public purchasers more positive towards PPI
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There are also several studies that has concluded that training in the PPI process is a success factor for implementation of PPI such as (Analysis & Strategy and Oslo Economics 2015).

Purchasers have put forward that one of the most important element to address is the competence (Menon Economics 2016).

Several studies such as (Analysis & Strategy and Oslo Economics 2015) has also concluded that leader involvement that can be regarded as a part of strategic anchoring for PPI is a critical success factor for PPI. Purchasers have put forward that the most important element to address is the organization issues such as strategic anchoring for PPI and PPI training (Menon Economics 2016). Therefore, there is most likely a positive effect on purchaser's attitude towards PPI if there are more organizations support. So, the second hypothesis is then.

H2: Organization's support makes public purchasers more positive towards PPI

And again, several studies such as (Analysis & Strategy and Oslo Economics 2015) has also concluded that leader involvement that can be regarded as a part of strategic anchoring for PPI is a critical success factor for PPI. Purchasers have put forward that the most important elements to address is the organization issues such as strategic anchoring for PPI and PPI training (Menon Economics 2016). Therefore, there is most likely a positive effect on purchaser's expectation of positive return from PPI when they get good organizational support. The third hypothesis is thus.

H3: Organization's support increases public purchaser's expectations of positive returns from PPI

By strengthening the evidence base for PPI, the EU aims to make purchasers more favorable to use PPI and aim for more innovative public procurement (European Commision 2014).

Therefore, the third hypothesis is.

H4: Public purchasers' expectations of positive returns from PPI increase their attitude towards it

The EU puts forward that risk mitigation for public purchasers is important to make way for more success with PPI. And that by having more risk mitigation the public procurement can aim for more innovative procurement that will solve the societal problems of today and tomorrow (European Commision 2014). This is why the last hypothesis is as follows.

H5: More economic incentive arrangements strengthen the association between public purchaser's expectations of positive returns and their attitude toward PPI.

6.4 Conceptual model

The figure below shows the structural model created in SmartPLS3 for testing the above-mentioned hypotheses. Description of the focal constructs and the control variables included in the model follows.

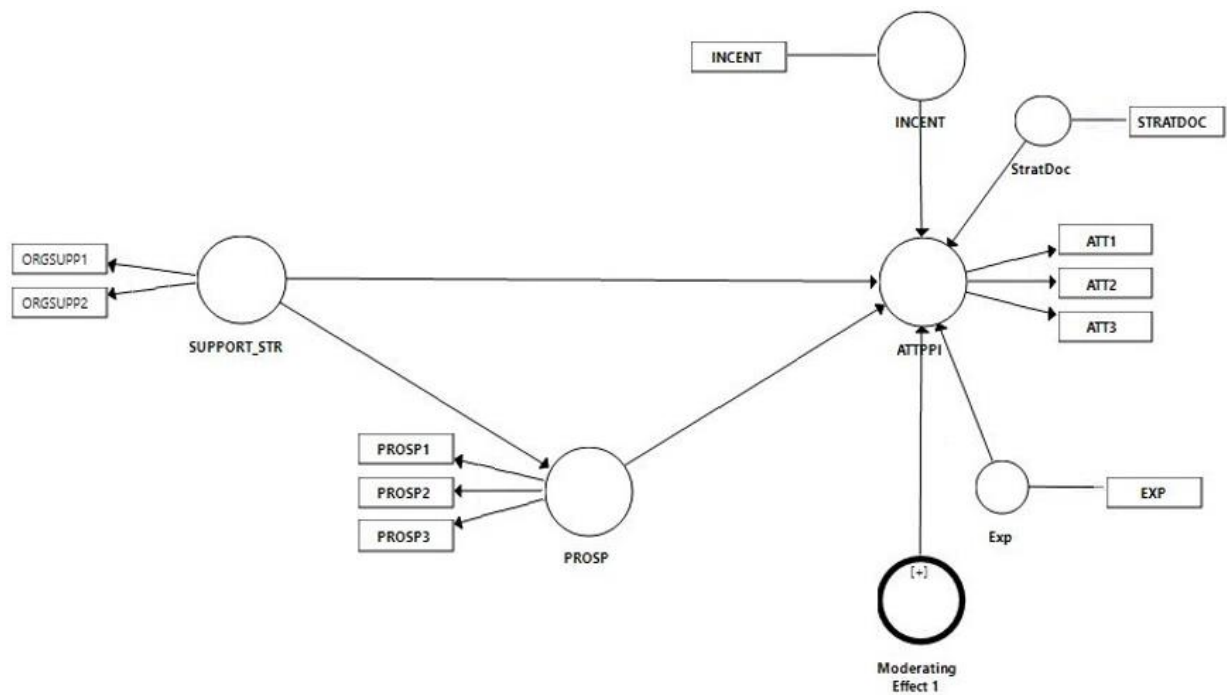


Figure 7: Structural model (SmartPLS3)

6.4.1 Measures of survey data

The conceptual model was made to assess the public purchaser's attitudes towards PPI to test the hypotheses. And the measures of constructs and control variables used in this study are listed below with the questions asked for the constructs. These constructs below regard the first part of the survey that regards attitude towards PPI.

Attitude towards PPI: (ATTPPI)

This construct was measured based on the purchaser's opinions regarding their own attitudes of PPI and it was comprised of the following items:

ATT1: Å utføre innovative offentlige anskaffelser gir meg en stor mulighet for personlig profesjonell utvikling.

ATT2: Jeg stiller meg veldig positivt til innovative offentlige anskaffelser.

ATT3: Å utføre innovative offentlige anskaffelser er en spennende oppgave.

Support structure: (SUPPORT_STR)

This construct was measured on facts about the level of PPI training and leader involvement and it was comprised of the following items:

ORGSUP1: Jeg har mottatt tilstrekkelig opplæring i innovative offentlige anskaffelser.

ORGSUP2: Det er forankret sterk støtte for innovative offentlige anskaffelser fra mine ledere.

PPI prospects: (PROSP)

This construct was measured on the purchaser's opinions regarding the outcomes of PPI and it was comprised of the following items:

PROSP1: Innovative offentlige anskaffelser er den beste tilnærmingen for å oppnå merverdi for pengene.

PROSP2: Innovative offentlige anskaffelser er den beste tilnærmingen for å gjøre det mulig for kommunen å levere tjenester av høy kvalitet til folket.

PROSP3: Innovative offentlige anskaffelser er den beste tilnærmingen for å garantere leverandørutvikling.

Incentive arrangements: (INCENT)

This is a single-item construct that was based purely on the purchaser's opinion regarding availability of incentive structures.

INCENT: Det er tilgjengelig gode nok incentiv strukturer som senker den finansielle risikoen involvert med å sikte på innovative offentlige anskaffelser.

Control variables

To increase robustness of the results two control variables were included. They were based on statements made by the national program for supplier development. They defined the maturity of the organizations based on how many innovative procurement-processes the unit had carried

out (Exp), and if the unit had PPI included in their strategy document (StratDoc). They stated that some of the informants for the interviews was “in the middle of the tree” regarding experience, and in the interviews these informants stated that they had carried out about 2 procurements that they regarded as being innovative public procurements.

StratDoc: Har dere forankring for innovative offentlige anskaffelser i deres strategidokument?

Exp: Har dere gjennomført 3 eller mer innovative offentlige anskaffelser?

6.5 Statistical analysis technique for analysis of the survey results

In this section the choice of analysis for the first part of the survey will be presented. The data from the first part of the survey was tested using partial least squares (PLS) path modeling. This is a composite-based form of structural equation modeling (SEM). Path analysis models were developed in the early 1920s. Structural models as applied in the social sciences began appearing in the 1970s. PLS-SEM is the approach that has become established business research (Hair, Ringle and Sarstedt 2014). Conceptually and practically, PLS-SEM is similar to using multiple regression analysis. The primary objective is to maximize explained variance in the dependent constructs but additionally to evaluate the data quality on the basis of measurement model characteristics (Hair, Ringle and Sarstedt 2014).

Two types of methods of SEM exists, this is covariance-based techniques (CB-SEM) and variance based partial least squares (PLS-SEM). Smart-PLS has smaller sample size requirements compared to CB-SEM and thus PLS-SEM has been chosen as method in this research (Hair, Ringle and Sarstedt 2014) (Henseler, Ringle and Sinkovics 2015).

The approach to evaluate PLS-SEM models is a two-step process. *First* the assessment of the outer model and *second* the assessment of the inner model. PLS path models are formally defined by two sets of linear equations: the inner model and the outer model.

The inner model specifies the relationships between unobserved or latent variables, whereas the outer model specifies the relationships between a latent variable and its observed or manifest variables (Henseler, Ringle and Sinkovics 2015).

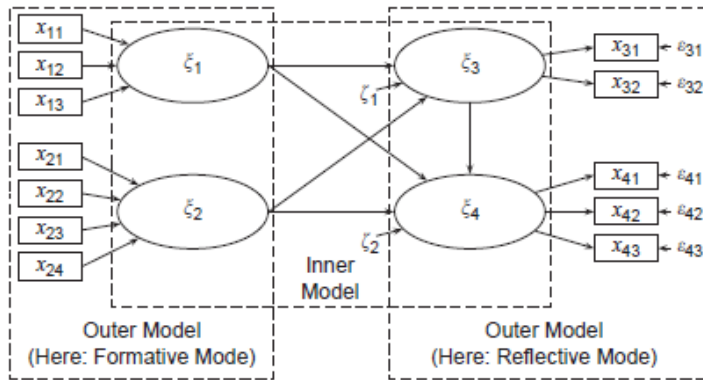


Figure 8: Outer and Inner model (Henseler, Ringle and Sinkovics, 2015)

At the beginning of the two-step process, model assessment focuses on the measurement models. It starts with assessing reliability and validity according to certain criteria that are associated with formative and reflective outer model. It only makes sense to evaluate the inner path model estimates when the calculated latent variable scores show evidence of sufficient reliability and validity (Henseler, Ringle and Sinkovics 2015).

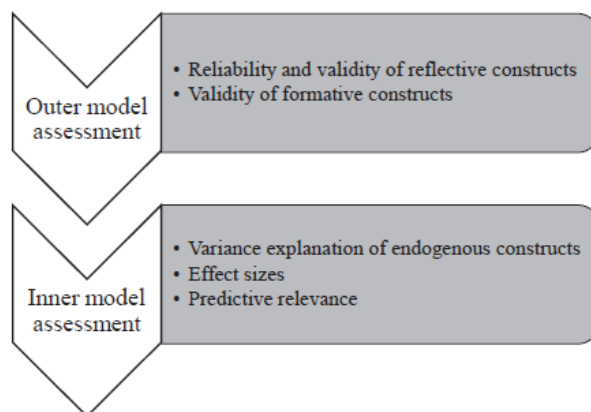


Figure 9: Model assessment (Henseler, Ringle and Sinkovics, 2015)

The data analysis in this study was conducted using a program called SmartPLS3. Given the nature of the indicators from the survey PLS-SEM is a good choice of analysis method (Hair, Ringle and Sarstedt 2014). And the survey got 114 replies, so the thresholds of 100 observations is met (Assaker, Huang og Hallak 2012) and the recommended PLS-SEM minimum sample size should be equal to the larger of the following: (1) ten times the largest number of formative indicators used to measure one construct or (2) ten times the largest number of structural paths directed at a particular latent construct in the structural model. This is also met (Hair, Ringle and Sarstedt 2014).

6.5.1 Descriptive statistics

The analysis will start with the use of descriptive statistics. This is useful when dealing with large sets of data (Ubøe 2012).

These analyses will include the mean, standard deviation, and the total of respondents from the survey. There will also be statistics on missing data. Missing data is a common problem in research using survey as a tool, and when missing data exceeds 15% of the observations, Hair et al. (2014) describes that the observation may be removed from the data set. In this study missing data is replaced with mean values, as the response rate overall was quite high.

6.5.2 Assessment of the model

It is crucial to test if the measurement model is good. And it is crucial to test this in order to make sure that the results are valid, and that the conclusions drawn from the analysis is not faulted (Hair, Ringle and Sarstedt 2014).

6.5.2.1 Reliability analysis

The assessment starts with reliability analysis. This begins by checking the internal consistency by looking at the Cronbach's alpha. The Cronbach's alpha should be above 0,7 (Hair, Ringle and Sarstedt 2014). Unlike Cronbach's alpha, composite reliability does not assume that all indicators are equally reliable, making it more suitable for PLS-SEM. Composite reliability values of 0,60 to 0,70 in exploratory research and values from 0,70 to 0,90 in more advanced stages of research are regarded as satisfactory (Hair, Ringle and Sarstedt 2014).

Then the convergent validity is assessed by the value of the average variance extracted (AVE) with the recommendation of AVE above 0,5 (Hair, Ringle and Sarstedt 2014). An AVE value of 0,50 and higher indicates a sufficient degree of convergent validity, meaning that the latent variable explains more than half of its indicators variance (Hair, Ringle and Sarstedt 2014).

Then the next step is to look at the loading of each indicator in the model, and the recommendation is that the loading is above 0,7 (Hair, Ringle and Sarstedt 2014).

The final step is to check the Discriminant Validity (HTMT). This is to check if all the variables in the model is distinct from other variables. (Hair, Ringle and Sarstedt 2014) The thresholds here are that the values should be below 0,85 (Voorhees, et al. 2015).

6.5.2.2 Multicollinearity

Each indicators variance inflation factor (VIF) value should be less than 5. VIF value of 5 which implies that 80 percent of an indicator's variance is accounted for by the remaining formative indicators related to the same construct. This indicates potential multicollinearity problems (Hair, Ringle and Sarstedt 2014).

6.5.2.3 Approximate model fit

Approximate model fit criteria help answer the question how substantial the discrepancy between the model-implied and the empirical correlation matrix is. This question is particularly relevant if this discrepancy is significant. Currently, the only approximate model fit criterion implemented for PLS path modeling is the standardized root mean square residual (SRMR). A cut-off value of 0.08 as proposed by Hu and Bentler (1999) appears to be adequate for PLS path models (Henseler, Hubona and Ray 2016).

6.5.3 Structural model and hypothesis testing

The estimated model was tested by checking path coefficients, R^2 values, effect size (f^2), and approximate model fit. The judgment of what R^2 level is sufficient depends on the specific research discipline. R^2 results of 0,20 are considered high enough in disciplines such as for example consumer behavior. In fields such as natural science much higher R^2 levels are needed in order to be assumed as acceptable, but in the fields that relate to human's behavior much lower values can be justified. Paths that are nonsignificant or show signs contrary to the hypothesized direction do not support a prior hypothesis, whereas significant paths showing the hypothesized direction empirically support the proposed causal relationship (Hair, Ringle and Sarstedt 2014).

For the significant effects it makes sense to quantify how substantial they are, which can be accomplished by assessing their effect size f^2 .

f^2 values above 0.35, 0.15, and 0.02 can be regarded as strong, moderate, and weak, respectively (Cohen, 1988). But however, Angus et al. (2005) have shown that the average effect size in test of moderation is only 0,009 and against this background Kenny (2016) proposes that 0.005, 0.01 and 0,25 are more realistic in terms of small, medium and strong, but point out that even these values are optimistic given Angus et al. (2005) review (Hair, et al. 2017). The path coefficients are essentially standardized regression coefficients, which can be assessed with regard to their sign and their absolute size. They should be interpreted as the change in the dependent variable if the independent variable is increased by one and all other independent variables remain constant. Indirect effects and their inference statistics are important for mediation analysis, and total effects are useful for success factor analysis (Henseler, Hubona and Ray 2016).

6.5.3.1 Bootstrapping

To test the hypotheses the model was run using 5.000 bootstrap resamples (Henseler, Hubona and Ray 2016). PLS-SEM does not presume that the data are normally distributed.

Bootstrapping is a method of repeated random sampling with replacement from the original sample to create a bootstrap sample, to obtain standard errors for hypothesis testing. The process assumes that the sample distribution is a reasonable representation of the intended population distribution. The bootstrap sample enables the estimated coefficients in PLS-SEM to be tested for their significance (Hair, Ringle and Sarstedt 2014).

The procedure creates a large, prespecified number of bootstrap samples by randomly drawing cases with replacement from the original sample. Each bootstrap sample should have the same number of cases as the original sample. The PLS algorithm estimates the SEM results from each bootstrap sample. The repeated bootstrap parameter estimates are then used to create an empirical sampling distribution for each model parameter, and the empirical sampling distribution's standard deviation is used as proxy for the empirical standard error for the parameter. The PLS-SEM results of all the bootstrap samples provide the standard error for each path model coefficient. With this information, a t-test can be performed to measure the significance of path model relationships. The bootstrapping analysis allows for the statistical testing of the hypothesis that a coefficient equals zero (null hypothesis) as opposed to the alternative hypothesis that the coefficient does not equal zero (two-tailed test) (Hair, Ringle and Sarstedt 2014).

A statistical hypothesis test has the following elements:

- *A hypothesis zero or **H0** and an alternative hypothesis **HA**.* In this study we have several hypothesis's **H1** to **H5** and they are all alternative hypotheses with their own **H0**.
The alternative hypothesis is a claim about populations, systems or reality.
- *A random variable called the T value.* Briefly speaking the larger the T value is, the more unlikely it is that the observation is just a coincidence. Using probability distribution for the T value we can find the probability or P-value that defines how big / small the probability is for the T value to be just a coincidence.
- *And a cut of point.* When the P value in regards of the T value for the test ends up below the cut of point the **HA** is regarded as confirmed. A 0.05 cut off point is used in this study, as it is a commonly used level of significance. And the lower the P value is, the stronger the evidence for **HA** is regarded to be (Ubøe 2012).

When carrying out a hypothesis test using PLS-SEM the researcher also need to take into account the path coefficients that is calculated when running the bootstrap. And even though if the P value is below the cut of point, if the alternative hypothesis states that A should give a positive effect on B and then the path coefficients between A and B comes out as negative **HA** cannot be confirmed because the direction of the path coefficients is the opposite of what the hypothesis stated (Hair, Ringle and Sarstedt 2014).

6.5.3.2 Moderating effects

Moderating effects in the context of PLS path modeling describe a moderated relationship within the structural model. This means that one construct moderates the direct relationship between two other constructs (Fassott, Henseler and Coelho 2016).

6.5.3.3 Mediation effect / mediation analysis

Most structural models are subject to mediation effects. Many researchers overlook this fact in their PLS-SEM analyses. If they don't examine and interpret the result of a full mediation but simply state that a relationship between two latent variables is not significant they can wrongly conclude that, in the structural model, the relationship between the two latent variables is zero (Hair, Ringle og Sarstedt 2013).

Mediation occurs when a third variable intervenes between two other related constructs. This means that a mediator variable governs the nature of the relationship between two constructs (SmartPLS.com 2018).

Analyzing the strength of the mediator variable's relationships with the other constructs allows substantiating the mechanisms that underlie the cause-effect relationship between an exogenous construct and an endogenous construct. In the simplest form, the analysis considers only one mediator variable (SmartPLS.com 2018).

The following figure shows the example of a simple mediator model, whereby p_3 is the direct effect, $p_1 * p_2$ is the indirect effect, and the direct effect p_3 + the indirect effect $p_1 * p_2$ = the total effect (SmartPLS.com 2018).

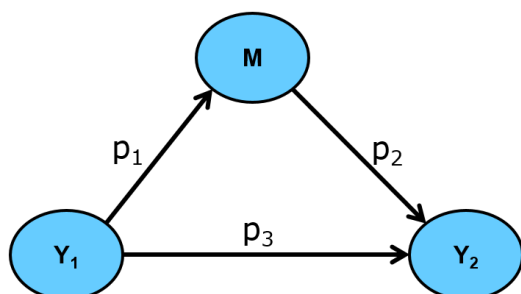


Figure 10: Simple mediator model (SmartPLS.com 2018)

To analyze a mediator model, Zhao et al. (2010) suggest a model, as shown in the following figure, which Hair et al. (2017) also propose to use for PLS-SEM (SmartPLS.com 2018).

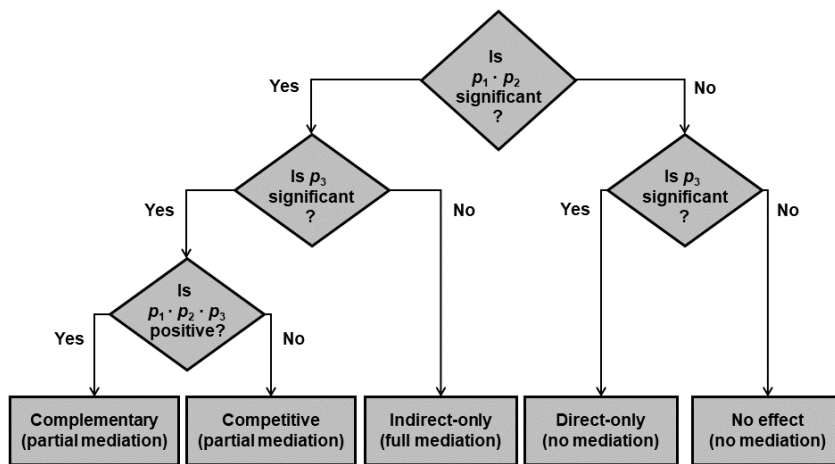


Figure 11: How to analyze a mediator model (SmartPLS.com 2018)

As a result, the researcher decides with regards to the indirect effect, if mediation and what kind of mediation occurs (SmartPLS.com 2018).

6.6 PLS-SEM analysis of survey results

In this section the survey results regarding Attitudes towards PPI (ATPPI) will be analyzed according to the earlier mentioned techniques.

The survey got a total of 114 responses. There was sent out 200 e-mail invitations for the survey, the response rate was thus $114/200=57\%$.

6.6.1 Preparation of data for analysis

In this section a presentation of the overall picture of the data attained from the survey regarding the relevant constructs will be presented. It will also cover the data cleaning procedures.

6.6.1.1 Preparation and overview of data

It is common that there is some careless answering to surveys. And a procedure to identifying these cases can be to look for repeated use of the same response category. When assessing the data there were some responses that firstly looked like they had strings of the same answers, but there was not a total string of the same answers from respondents. All data was kept from the surveys. But there was found some responses with missing data, but not much in the data that deals with the conceptual model.

The survey results labels also were renamed in SPSS. The aims were that it would be easier to assess according to the conceptual model. The 3 questions asked for attitude was labeled ATT1, ATT2 and ATT3. The question for economic incentive arrangement where labeled INCENT, and training was named ORGSUP1, anchoring was labeled ORGSUP2 and the prospects PROSP1, PROSP2 and PROSP3. The datafile was then saved as a CSV file that is readable in SmartPLS3.

6.6.1.2 Missing data

It is common with missing data when conducting survey research. The dataset of this study was assessed for missing data with the use of SPSS and missing value analysis. And it shows that there is not much data missing overall in the relevant answers from the survey regarding the conceptual model.

Table 3: Missing data analysis (SPSS)

	Univariate Statistics				
	N	Mean	Std. Deviation	Missing Count	Missing Percent
ATT1	114	3.99	.770	0	.0
ATT2	113	4.25	.738	1	.9
ATT3	113	4.14	.789	1	.9
INCENT	112	2.66	.865	2	1.8
ORGSUPP1	114	2.69	1.130	0	.0
ORGSUPP2	114	3.05	1.247	0	.0
PROSP1	114	3.20	.822	0	.0
PROSP2	114	3.23	.776	0	.0
PROSP3	114	3.57	.872	0	.0

But it is still important to address how to handle these missing data when carrying out the analysis. SmartPLS3 provides 3 options, Mean replacement, Case wise deletion and Pairwise deletion. Mean replacement was used in this study because there was so little relevant data missing.

6.6.2 Descriptive statistics

Table 4: Descriptive statistics of survey data (SPSS)

Descriptive Statistics			
	N	Mean	Std. Deviation
ATT1	114	3.99	.770
ATT2	113	4.25	.738
ATT3	113	4.14	.789
INCENT	112	2.66	.865
ORGSUPP1	114	2.69	1.130
ORGSUPP2	114	3.05	1.247
PROSP1	114	3.20	.822
PROSP2	114	3.23	.776
PROSP3	114	3.57	.872
Valid N (listwise)	110		

6.6.3 Construct reliability and validity

The reliability analysis shows the internal consistency by looking at the Cronbach's alpha. The Cronbach's alpha is above 0,7 for all constructs excluding SUPPORT_STR that is just below with 0,662. This construct is then checked for the composite reliability and is above the earlier mentioned threshold. Then the convergent validity is assessed by the value of the average variance extracted (AVE) and everything is above 0,5. If something was below 0,5 it would mean that those questions were not related to the same thing. And above means that the questions were relevant, and pointing to the same thing.

Table 5: Construct reliability and validity (SmartPLS 3)

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
ATTPPI	0,828	0,897	0,745
Exp	1,000	1,000	1,000
INCENT	1,000	1,000	1,000
Moderating Effect 1	1,000	1,000	1,000
PROSP	0,825	0,895	0,740
SUPPORT_STR	0,662	0,853	0,744
StratDoc	1,000	1,000	1,000

Then the next step is to look at the loading of each indicator in the model, and all indicators are loading above 0,7 as they should.

Table 6: Factor loadings (SmartPLS 3)

	ATTPPI	Exp	INCENT	Moderating Effect 1	PROSP	SUPPORT_STR	StratDoc
ATT1	0,824						
ATT2	0,869						
ATT3	0,894						
EXP		1,000					
INCENT			1,000				
ORGSUPP1						0,817	
ORGSUPP2						0,906	
PROSP * INCENT				1,293			
PROSP1					0,921		
PROSP2					0,876		
PROSP3					0,777		
STRATDOC							1,000

Then the Discriminant Validity (HTMT) was checked. This was to check if all the variables in the model is distinct from other variables. In other words if the constructs are different from each other and not the same. And they are below the threshold of 0,85.

Table 7: Discriminant validity (HTMT) (SmartPLS 3)

	ATTPPI	Exp	INCENT	Moderating Effect 1	PROSP	SUPPORT_STR	StratDoc
ATTPPI							
Exp	0,164						
INCENT	0,031	0,118					
Moderating Effect 1	0,281	0,066	0,005				
PROSP	0,523	0,159	0,106	0,035			
SUPPORT_STR	0,325	0,369	0,378	0,110	0,261		
StratDoc	0,149	0,472	0,047	0,114	0,103	0,500	

6.7 Structural model and hypothesis testing

Below is the structural model that was estimated for this study including the factor loadings for the focal constructs and the control variables. The factor loadings are as all ready mentioned all above 0,7.

In the model it is also important to notice that the path coefficients are positive between SUPPORT_STR -> ATTPPI, SUPPORT_STR -> PROSP, PROSP -> ATTPPI. But they are negative between INCENT -> ATTPPI, and also negative from the Moderating effect -> ATTPPI.

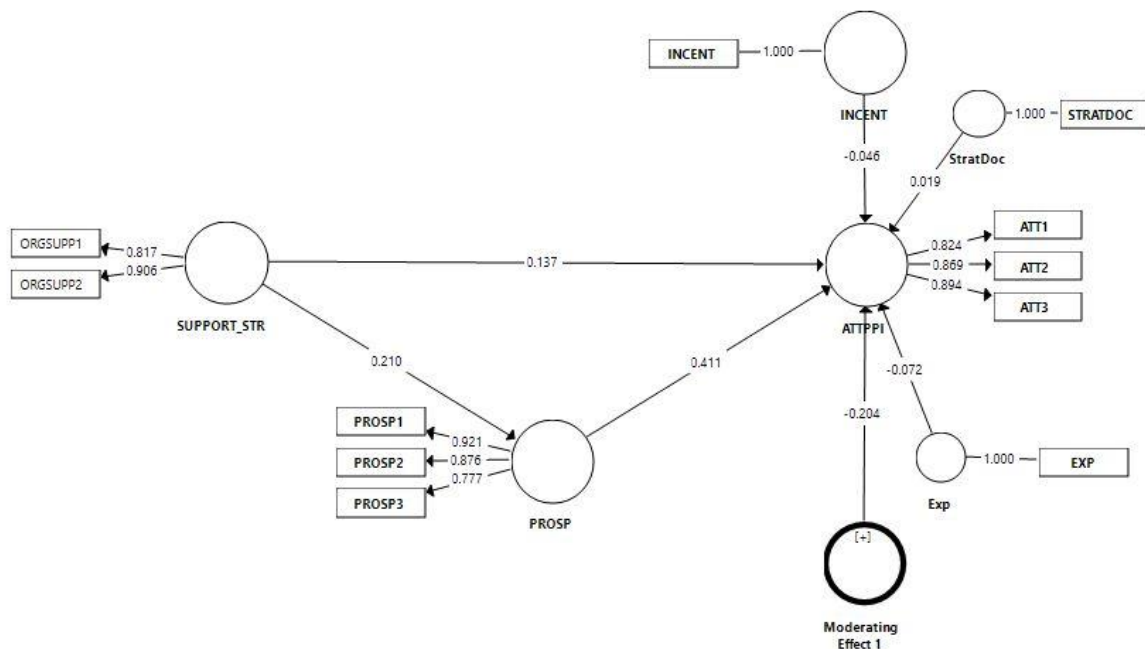


Figure 12: Structural model. Factor loadings and path coefficients (SmartPLS 3)

The model of the study has an R^2 Value of 0,29 for ATTPPI. The R Squared adjusted for ATTPPI has the value of 0,25 that implied that the 25% of the purchasers attitude towards PPI can be explained by the elements in the model. And this indicates that the model gives an adequate description of the data. R^2 values above 0,2 are as described earlier enough in business research.

Table 8: R square (SmartPLS 3)

	R Square	R Square Adjusted
ATTPPI	0,290	0,250

For the significant effects it makes sense to quantify how substantial they are, which can be accomplished by assessing their effect size f^2 . f^2 values above 0.35, 0.15, and 0.02 can be regarded as strong, moderate, and weak, respectively. And in the model the effects that are above this threshold is PROSP that suggest that the effects of PROSP on ATTPPI is moderate, and Moderating Effect 1 with a weak effect on ATTPPI. But when it comes to moderating effects Angus et al. (2005) has shown that the average is 0,009. Compared to that the model shows a strong moderating effect (Hair, et al. 2017). And there is also a moderate effect of SUPPORT_STR on PROSP with a value of 0,046.

Table 9: f^2 (SmartPLS 3)

	ATTPPI	Exp	INCENT	Moderating Effect 1	PROSP	SUPPORT_STR	StratDoc
ATTPPI							
Exp	0,005						
INCENT	0,003						
Moderating Effect 1	0,094						
PROSP	0,225						
SUPPORT_STR	0,018				0,046		
StratDoc	0,000						

Approximate model fit criteria help answer the question how substantial the discrepancy between the model-implied and the empirical correlation matrix is. And the SRMR is below the threshold of 0,08. This tells us that the variables that was chosen for this model actually makes sense. If it where above 0,08 the model would be irrelevant.

Table 10: SRMR (SmartPLS 3)

	Saturated Model	Estimated Model
SRMR	0,068	0,069

Each indicators variance inflation factor (VIF) value should be less than 5. And all indicators in the model is below that threshold so we don't have correlation issues.

Table 11: VIF (SmartPLS 3)

	VIF
ATT1	1,679
ATT2	2,004
ATT3	2,293
EXP	1,000
INCENT	1,000
ORGSUPP1	1,325
ORGSUPP2	1,325
PROSP * INCENT	1,000
PROSP1	2,373
PROSP2	2,132
PROSP3	1,588
STRATDOC	1,000

6.7.1 Hypotheses testing using Bootstrap resamples and mediation analysis

To test the hypotheses the model was run using 5.000 bootstrap resamples as described earlier. This gives the T statistics and P values.

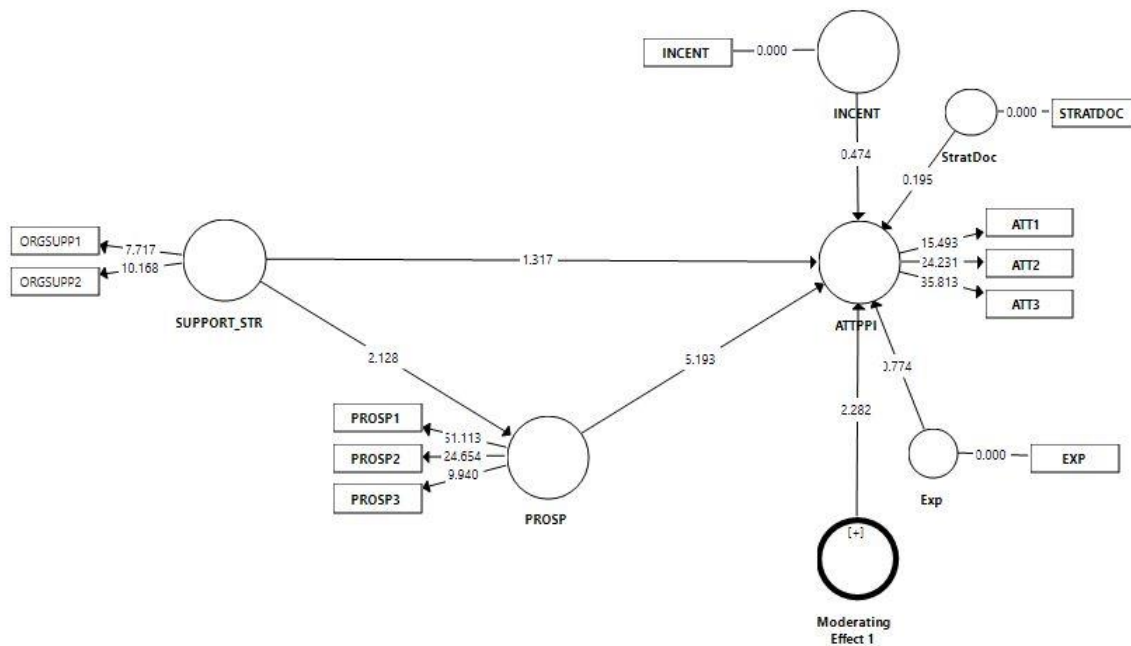


Figure 13: Structural model. Bootstrap with T Statistics (SmartPLS 3)

We observe that there is a full mediation effect according to the method mentioned earlier because of the fact that SUPPORT_STR -> PROSP -> ATTPPI is significant but, SUPPORT_STR has some effect directly on ATTPPI, but it is not significant, and there is also a much stronger effect on the path that goes trough PROSP.

Table 12: Bootstrap with P Values. Green values are significant. (SmartPLS 3)

	T Statistics	P Values
Exp -> ATTPPI	0,774	0,439
INCENT -> ATTPPI	0,474	0,636
Moderating Effect 1 -> ATTPPI	2,282	0,023
PROSP - ATTPPI	5,193	0,000
SUPPORT_STR -> ATTPPI	1,317	0,188
SUPPORT_STR -> PROSP	2,128	0,033
StratDoc -> ATTPPI	0,195	0,845

In the model SUPPORT_STR has some effect directly on ATTPPI, but it is not significant with a p value of 0,188 that is above the threshold of 0,05.

Thus, hypothesis **H2** is not confirmed.

But SUPPORT_STR has a significant effect on PROSP with a p value of 0,033 that indicates that training and anchoring leads to more positive opinions regarding the prospects and outcomes of PPI. And there is a really strong significant evidence with a T value of 5,193 and a p value of 0,000 on the effect from PROSP on ATTPPI. The path coefficients are also positive with values of SUPPORT_STR -> PROSP of 0,210 and PROSP -> ATTPPI of 0,411. This shows that these constructs elevate the constructs that they lead to, and thus training and support for PPI from leaders elevates the purchasers perception of the prospects of PPI, and this again elevates in turn the purchasers attitude towards PPI.

Thus, hypotheses **H3** and **H4** are both confirmed.

In regards of economic incentive structures and the effect they have on the purchaser's attitudes towards PPI the path coefficient is negative, and the direct effect of INCENT -> ATTPPI is also not significant with a p value of 0,636. But there is a significant Moderating Effect 1 -> ATTPPI with a p value of 0,023. But however, a negative path coefficient of -0,204. This means that when adding one standard deviation unit of INCENT the attitude towards PPI (ATTPPI) is actually going down and we have a pure moderating effect since INCENT -> ATTPPI is not significant. Put in other words the graphic below figure 14 shows that when there are no incentives present the attitudes towards PPI is high, but it gets lower when incentives are present.

The expected outcome before carrying out this study was that adding more economic incentives would strengthen the purchasers attitude towards PPI because of the fact of financial risk mitigation. But this suggest that this is not the case.

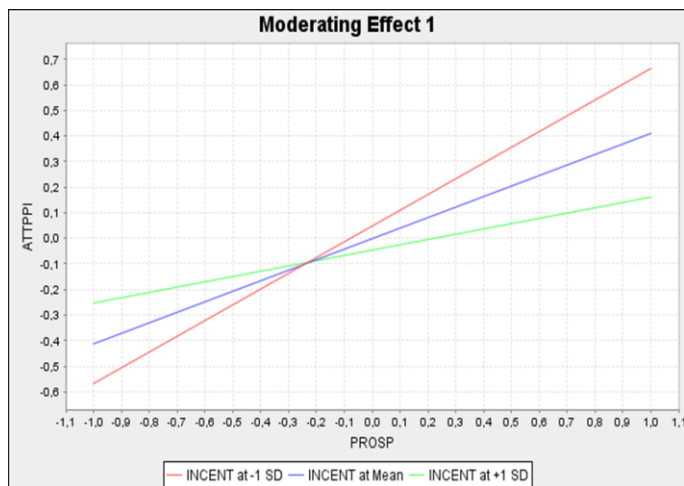


Figure 14: Moderating effect (PROSP*INCENT) (SmartPLS 3)

In other words it means that adding more economic incentive arrangements does not elevate the purchasers attitudes towards PPI, it actually lowers it. This can be a result from the statements that was given in the case study interviews about the large amounts of work the purchasers had to do when applying and reporting towards the owners of the economical incentives. But it is still a surprising result. Incentives is thus important for policy makers if they want to change the purchasers attitude towards PPI, but everything about the incentives has to be done correctly.

Thus, hypotheses **H1** and **H5** are not confirmed.

When addressing the control variables none of them are significant with p values of 0,439 and 0,845.

6.7.2 Summary hypothesis testing

H1: More economic incentive arrangements make public purchasers more positive towards PPI
NOT CONFIRMED

H2: Organization's support makes public purchasers more positive towards PPI
NOT CONFIRMED

H3: Organization's support increases public purchaser's expectations of positive returns from PPI
CONFIRMED

H4: Public purchasers expectations of positive returns from PPI increase their attitude towards it

CONFIRMED

H5: More economic incentive arrangements strengthen the association between public purchaser's expectations of positive returns and their attitude toward PPI.

NOT CONFIRMED

6.8 Survey answers regarding critical success factors and barriers

And in addition to the SmartPLS analysis there was also made some simple follow up questions aimed at critical success factors and barriers that are measured with the use of simple percentages as they are given by QueckBack to give an overview of the survey responses for these topics in addition to testing the hypotheses.

In this small section the survey responses regarding success factors and barriers will be presented as they are given on www.questback.com.

6.8.1 Critical success factors

15. Hvor viktig føler du at det følgende er for å oppnå suksess med innovative offentlige anskaffelser? Veldig uviktig = (1) Uviktig = (2) Hverken viktig eller uviktig = (3) Viktig = (4) Veldig viktig = (5)

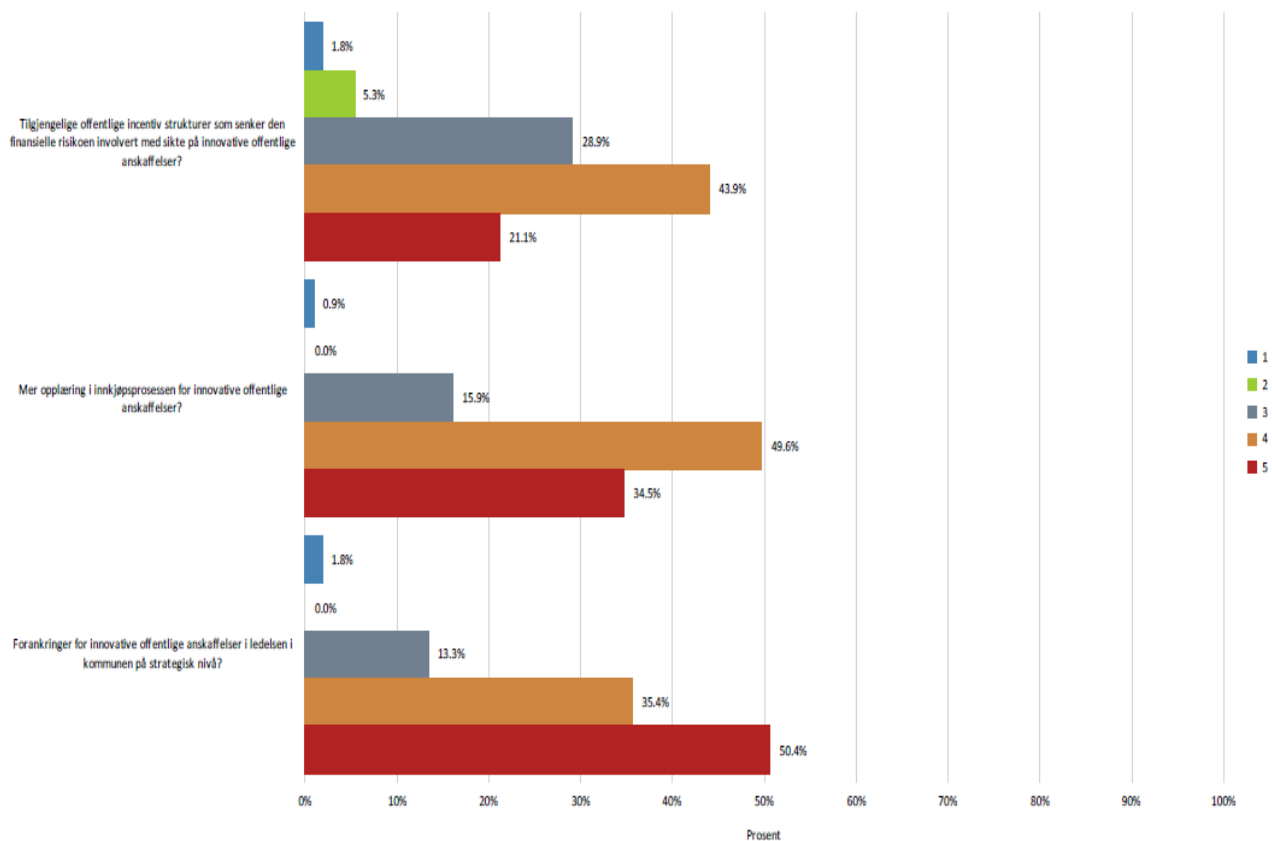


Figure 15: Survey results regarding critical success factors. (QuestBack)

From the responses above there is a rather big difference in the responses given that states 5 on the Linker scale regarding the 3 questions. While 34,5 % and 50,4 % totally agreed that PPI training and strategic anchoring for PPI was a critical success factor, only 21,1 % stated that they totally agreed that economic incentives was.

6.8.2 Barriers

19. Føler du at noe av det følgende er hindringer for gjennomføring av innovative offentlige anskaffelser? Sterkt uenig = (1) Uenig = (2) Hverken enig eller uenig = (3) Enig = (4) Helt enig = (5)

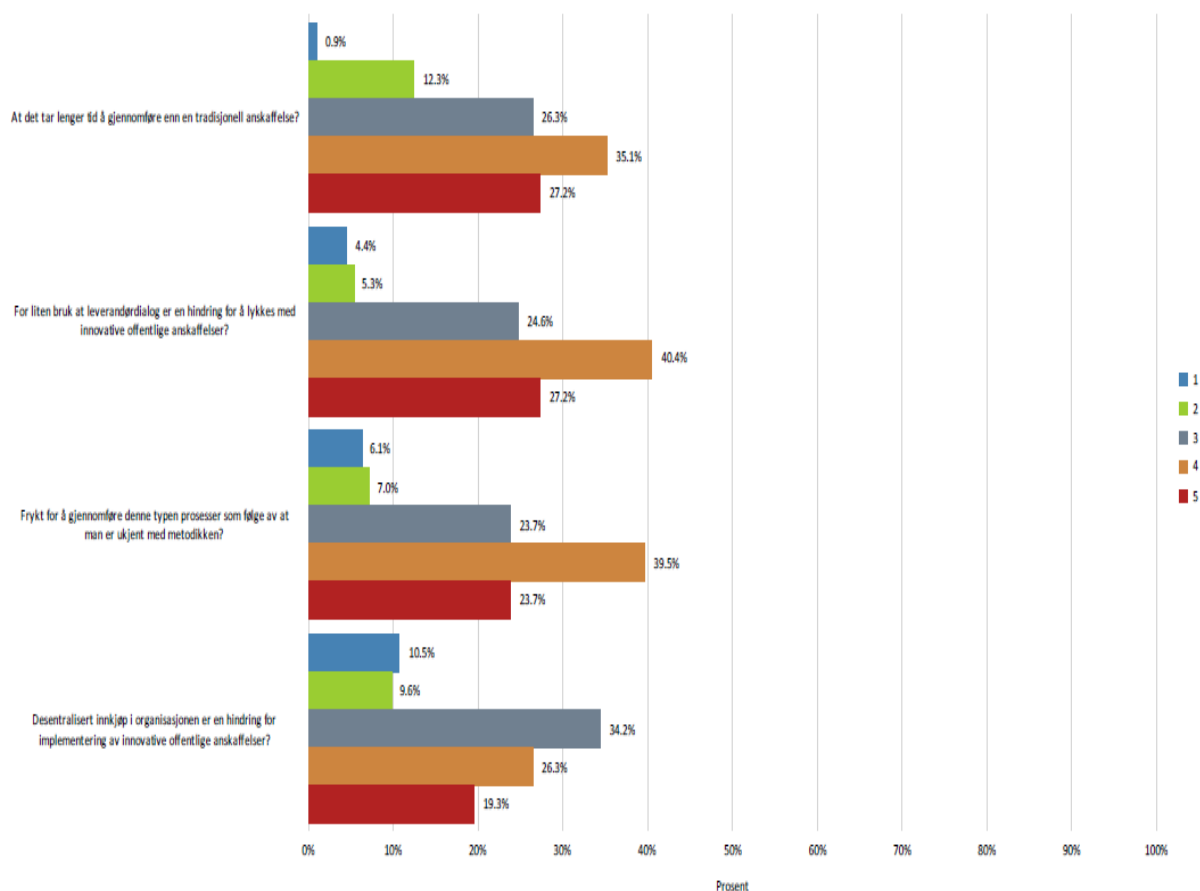


Figure 16: Survey results regarding barriers. (QuestBack)

When asked about if the purchaser regarded the extra time it takes to conduct the PPI purchasing process as a barrier for conducting an innovative public procurement 35,1 % + 27,2 % stated 4 or 5 on the Likert scale that means that they agree or totally agree with this statement.

When asked about if the purchaser regarded limited usage of dialog with the suppliers is a barrier for success with PPI 40,4 % + 27,2 % stated 4 or 5 on the Likert scale that means that they agree or totally agree with this statement.

When asked about if the purchaser regarded fear of conducting the PPI process because of lack of knowledge about the methodology is a barrier for conduction an innovative public procurement 39,5 % + 23,7 % stated 4 or 5 on the Likert scale that means that they agree or totally agree with this statement.

When asked about if the purchaser felt that decentralized purchasing within the organization is a barrier for implementing PPI 26,3 % + 19,3 % stated 4 or 5 on the Likert scale that means that they agree or totally agree with this statement.

CHAPTER 7

Discussion and limitations

7.1 Discussion

In this section the research findings from the study will be discussed, and the limitations of the thesis will be addressed. The usefulness of data analysis is that it enables researchers to make more sense of the data collected. The previous chapters provided answers to both the research questions and the hypotheses. Some of the hypotheses were confirmed while some were not.

The aim of PPI is among others to solve the world's societal problems, create more jobs, and to drive these changes by the large demand that public purchasing can create because of the large expenditures that are involved. In the Regulations for public procurement in Norway the purchasers are actually encouraged to use functional demands in the Norwegian regulations for public procurement § 15-1, and also in the guidebook for public procurement this is mentioned as important to achieve the best solutions. And this is a success factor for PPI. In order to deliver upon the visions for PPI, it is important that the suppliers are given the possibility to actually be innovative when delivering upon the need that is to be fulfilled. If the purchaser outlines the way the suppliers should solve the problem in the tender documents the suppliers will simply solve the issue in exactly the way that the purchaser has told them to. Then the innovative powers are at best set to the level of the purchaser's own perception of what is the best solution to that need. If the purchaser has outlined the solution, and how to deliver upon that solution in the tender documents the suppliers are locked in to that solution, and if they try to put forward a different solution than has been outlined in the documents this will simply lead to the tender from that supplier being most likely rejected. This can be seen in for instance § 24-8 in the Norwegian regulations for public procurement.

7.1.1 Why does public purchasers focus on a risk-averse approach

The public purchasers are today according to research by among others (Caloghirou, Protogerou og Panagiotopoulos 2015) (Menon economics 2017) most concerned with the fact that there is a lot more hardship if they purchase an unknown solution without a demonstrated history, than to just continue buying the solutions that they already know and has a demonstrated history. This is of course a way that will keep the purchaser and the

organizational unit free of bad publicity and also to assure that the need will be met in a way that is for the time being perceived by the organizational unit as the most risk-free solution. But it will not spur innovation, and there is also the possibility that the need is being solved with what can be argued to be the solutions of yesterday. From the case studies as mentioned earlier there was also given information that sheds light on the first research question about why public purchasers in Norway continue to focus on a risk-averse approach to procurement.

Not all the informants that were interviewed in this study had the same strategic leader involvement, and strategic anchoring for innovative public procurement. This makes the purchaser more hesitating when choosing between trying to compose the tender documents in such a way that it spurs more innovation, but in the same time involves more risk for both the purchaser and the organization.

There were also statements about using less dialog with suppliers if the purchaser, or the purchasing organization felt that they had good knowledge about the product or service. But this could also be a potential pitfall leading the purchaser into a false perception about knowing everything about what the cutting-edge solution for that need is. And when this is the case the purchaser will most likely buy this product or service in a much more historic fashion that could be the case if he always took the time to have more dialog, or at least not outline the details for the solution in the tender documents. This will most likely lead to the fact that the suppliers in this market would be locked in to the outlined solution that the purchaser makes in the tender documents. If the dialog is dropped, then the only option left that can spur some innovation is if the purchaser makes the tendering documents based on the outcomes that he wants. And that he does not describe the solution he wants in 100 % detail in the tender documents.

But it is important to note that sometimes innovation is not the most relevant when addressing purchasing in the public sector. If the purchaser is buying something totally based on lowest price or lowest cost that can be regarded as an off-the-shelf product, for instance office suppliers such as pencils or pens, then it will be reasonable to just purchase the items according to more detailed specification. This is also recommended in the guidebook for public procurement (Norwegian Guidebook for Public Procurement Regulations 2017).

And there are also sometimes other constraints that needs to be taken into account that sometimes leads the purchaser to outline exactly what he needs in the tender document. And

this can be the case for instance if the purchased item needs to fit together with something else that is in the possession of the organization. An example for this was given by one of the informants for the interviews.

But it seems rather obvious from both the literature and the case studies in this thesis, that the most common reason that purchasers also in Norway focus on a risk averse approach to procurement is that they are concerned with the fact that there is a lot more hardship if they purchase an unknown solution without a demonstrated history that fails. Than to just continue buying the solutions that they already know works and has a demonstrated history.

This is not a shocking discovery as mention earlier. And without the proper mandate and training the purchasers will most likely continue in this fashion.

7.1.2 Success factors for implementation of PPI in Norway

There is put forward recommendations and best practices from several different sources (European Commission 2014) (DIFI 2017b). The success factors that are being put forward in the mentioned sources in the literature review in this study are pretty much all given recognition by the informants for this study both in the interviews and also in the survey, but some interesting statements have been put forward that are relevant to take into account to explore more on the success factors in Norway. This can shed a light on what public purchasers especially in Norway with experience with PPI regard as critical strategic success factors for successful implementation of PPI.

Pretty much all informants in the case studies agreed on the importance DIFI recommendations (DIFI 2017b) of involving more people and thinking broader than usual when defining the need. They also agreed in the case studies on the importance to describe this need in a more open way to allow the suppliers to use their expertise, and that this was a success factor. The purchasers in the case studies also described the importance of dialog, and that this was something that in the more recent years had become increasingly used. An interesting statement was also made about the use of dialog in more recent years after the enactment of the new Norwegian law and regulations. That statement give reference to the Norwegian regulations for public procurement § 13-1, 13-2, 12-1 and § 12-2 that defines the dialog both before and after the tender competition has started. This is also mentioned in (Norwegian Guidebook for Public Procurement Regulations 2017).

The most experienced purchasers with regards to PPI put forward several interesting statements on success factors. When asked questions about if they were given a chance to advise someone who had not used the PPI process before, and what should be focused on several of them put forward the element of anchoring for PPI both in management and strategic documents. And those statements are also somewhat connected to what can be argued to have something to do with the purchaser's visions for the future, the prospects. From the PLS-SEM analysis there was strong significance in regards of the purchaser's perception of the prospects for PPI had a big impact on the purchaser's actual attitude towards PPI with strong positive path coefficient. And I will argue that by focusing strongly on the elements that can elevate Norwegian public purchaser's perceptions of the prospects of PPI they are in a better position to have, or at least get an even more positive attitude towards PPI. And this will arguably lead to the fact that if they have a proper mandate in the organization to aim for innovation with the risks it involves,

they will most likely make an effort to use the techniques that spur innovation such as supplier dialog and not detailing the solution in the tender documents if they of course also have the proper training in PPI. This vision for the future is also put forward in literature on change management (Martinsen 2004) and in literature on changing attitudes more evidence on the prospects of PPI can also change the attitudes of the purchasers (Festinger 1957). In the study and the PLS-SEM analysis it was also shown that the support structure that involved both training and mandate to aim for innovation had a significant positive effect on the prospects of PPI. And both hypothesis H3 and H4 where confirmed. It was not a surprise that training and strategic anchoring was regarded important by the purchasers. This is already rated as important by Norwegian research (Analysis & Strategy and Oslo Economics 2015) (European Commision 2014) and many more.

From the survey of critical success factors the study reveals that training and strategic anchoring for PPI was regarded as really important in terms of being perceived as critical success factors. And this is not surprising. But I will argue that the issue is to put even more effort into proving the effect of PPI so that the evidence base for PPI gets even bigger and more known by the Norwegian public purchasers. This will if done correctly arguably elevate the purchaser's perception of the prospects of PPI to a great extent. This is also a goal from the European Commission (European Commision 2014) and the Norwegian government (Ministry of Trade and Industry 2013). There is also again the evidence from literature on change management in this study, that argues for positive effects by focusing on the prospects and a vision of what can be achieved will be important to succeed in managing this change towards focusing even more on PPI (Martinsen 2004). And again, also from literature on changing attitudes. (Festinger 1957)

Some other interesting findings from the case study interviews is that there is a somewhat mixed knowledgebase about what PPI actually is. There seems like there should be focus in the PPI training on the differences between public procurement for innovation, and public procurement of innovation. These two are separate things as described at the start of this thesis. The first aim to use the demand and functional descriptions as a tool to drive what can be regarded as incremental innovation, while the other asks for something that is not available in the market today and can be regarded as more of a game changer or at least a break through innovation. By including more in the training on PPI about the differences between the two different types of PPI I will argue that this can lead to a better view of the prospects of PPI. If

the public purchasers get a sound understanding that there does not need to be created something brand new in order for it to be an innovation, then maybe more would aim to what one of the informants called “Knowledge based purchasing” where they include some of the techniques of PPI such as dialog and functional demands towards products or services that was already in the market today. The purchasers must also be aware of the definition of innovation both in the EU directive and in the Norwegian law that states that it is innovation both when there is created something new, or if something is significantly improved. Then hopefully this would lead to the fact that more and more public purchasers would try out the techniques in small scale at first, and this would strengthen the confidence leading to more and more innovation both from incremental innovation and the more game changers where this is possible. This again would strengthen the evidence base of successful outcomes that arguably can lead to more purchasers having a better view of the PPI prospects. This is also a key element that is focused on from the European union as I elaborated on in the literature review (European Commission 2014).

As for the economic incentive structure they are also recognized as important from the views of the informants in the case studies. And in the last part of the survey regarding barriers and success factors when asked if available economic incentive structures that lowered the financial risk aiming for innovation was regarded important to achieve successes with implementation of PPI 43,9 % + 21,1 % stated 4 or 5 on the Likert scale that means that they agree or totally agree with this statement. The literature review showed that the research on the Norwegian purchaser's opinions regarding economic incentives varies (Analysis & Strategy and Oslo Economics 2015) (Menon Economics 2016). But from the case studies several statements were given from several informants stating that the reporting and applying procedures was regarded as somewhat of a struggle. And the PLS-SEM analysis of the survey showed that it was also a negative moderating effect. This was a surprising result, as the outcome was expected to be positive meaning that making available more economic incentives in the same shape and form that they are now would lead to a more positive attitude towards carrying out PPI because of the risk reduction. And the PLS-SEM analysis showed that the hypotheses **H1** and **H5** was not confirmed. So, it would seem appropriate to add more research on the shape and form of both the applying and reporting procedures for the available incentives as there seems to be something about these issues that are lowering the purchasers attitude regarding PPI as a whole.

7.1.3 Barriers for implementation of PPI in Norway

There is also put forward research uncovering several barriers regarding the implementation of PPI from different sources both in regards of what the suppliers focus on and more general ones that has more the views of the public purchaser in focus. And from the case studies pretty much all of the more general ones by (Edler and Yeow 2013) where addressed directly. But regarding this issue there was also made statements in the case studies that needs to be taken into account that sheds a light on what public purchasers in Norway regard as the main challenges in implementing procurement of innovative solutions.

One of the key barriers that was mention by several different informants was the fact that carrying out a full PPI purchasing process takes more time than more traditional purchasing without the supplier dialog. When asked in the final part of the survey regarding barriers and critical success factors about if the purchaser regarded that the extra time it takes to conduct the PPI purchasing process is a barrier for conducting an innovative public procurement 35,1 % + 27,2 % stated 4 or 5 on the Likert scale that means that they agree or totally agree with this statement. There was also made statement from one of the more experienced informants that the extra time could sometimes be accounted for by less complaints from the losing suppliers after the winner of the tender competition was announced. Since they felt that the process had been more open and see trough. That statement also visualizes one of the other key elements that has been elaborated on in the section above about success factors and that is that correct training is needed to elevate the perception of the prospects of PPI. If there is not enough training, or not the correct training this will be a barrier for implementation of PPI. The statement also showed that some of the extra time spent on the PPI purchasing process can be won back by a smoother transition into the new contract period with the new supplier. And I will also argue that if the aim is that the purchasing organization as a whole is in focus, then even though maybe the purchasing department spends more time on the procurement the organization as a whole can save back that extra time, and money, if the product or service fills the demand in a more suited way.

Another key element that was mentioned in the case studies was that it was important to be able to have dialog with the suppliers. This is also elaborated on in the section above regarding success factors, and if there is no dialog there is the chance of buying yesterday's solutions because of the fact that the purchasers don't have an updated knowledgebase for this solution. When asked about if the purchaser regarded that to little usage of dialog with the suppliers is a

barrier for success with PPI 40,4 % + 27,2 % stated 4 or 5 on the Likert scale that means that they agree or totally agree with this statement. And it is important to remember that there are different levels of this dialog, and if carried out in the wrong way it can be a barrier on its own. The purchaser can have a full-blown dialog meeting with all possible suppliers one by one, or he can schedule a group session where all possible suppliers gather and can get information about the purchasers need, and then give feedback. And there is also the possibility to use RFI and just get feedback if the tender documents are any good. The important part is that none of the suppliers in the dialog are given any leverage above the other suppliers. There needs to be perfect competition, this can be seen in The Norwegian regulations for public procurement § 13-1, 13-2, 12-1 and § 12-2. The statements in the case studies relating to the dialog shows that even though dialog is important, it is important to do it correctly in order to not ruin the supplier's willingness to innovate.

From the literature review (Menon Economics 2016) and the section above on success factors, and the PLS-SEM analysis, the study shows that the incentive structures of today are considered important to the purchasers because of the risk mitigation they financially provide. But they come out as somewhat of a barrier in this study because of the fact that they lower the purchaser's perception of the prospects of PPI, and when that goes down the purchaser's attitude towards PPI goes down. The reason for this seems according to the case studies to be the application procedures and reporting procedures that are connected to these incentives. As mentioned before it was surprising to see the result in the PLS-SEM analysis with the negative path coefficients, but it is important to address this in order for the incentives to work as they are intended and not come out as something that does not work in the best possible way.

Another key barrier that was mentioned in the literature review that also the informants in the case study gave feedback on, was that sometimes it was a challenge to be able to implement the innovation and change the organizational procedures, the routines and the actual capacities that are needed to do so (Edler and Yeow 2013). And I would argue that if there is not enough user involvement when defining the need for the purchase and some training and information about the purchased item after it is bought then this can be an effect that shows itself and then turn out to be a great barrier for innovation. There was also given statements about this in the case studies. This is a really important issue to focus on. From my own work experience giving tenders towards public procurement I sometimes see the negative effects of too little user involvement both in the tender process and after the purchase. Some examples of this can for

instance be when a contract period ends for our services, and we again win the next contract period but with different specifications given from the purchaser there is sometimes a lot of end user complaints due to the fact that they know nothing about the changes that has been made in the demands from the old to the new contract period. We also sometimes experience the same when we win contracts that has been in other supplier's portfolios before. What this leads to directly for the purchaser is that he gets a lot of complaints from the end users, complaining about the fact that suddenly the supplier of this week, is doing something else than the supplier for instance did last week, that was actually in the old contract period. And of course, all of these complaints are frustrating for the purchaser to have to deal with. I have also seen this go to the extremes. An example from my daytime job is when the purchaser for the next tender competition when the contract for our services end after four years, in his frustration from all the end user complaints from last time use exactly the same tender documents from four years ago, where he has even forgotten to change some dates in the written document has now incorporated every element that has been complained about from the end users in this contract period. Now the specifications are even more detailed outlining how we as a supplier should solve the purchasers needs, and this does not put us in a position to use our innovative powers as a supplier. And I will argue that the purchaser could make this much more efficient if he makes the effort to involve the users when defining the need and gives proper instructions about the contractual elements after a supplier is selected. This is an issue that can be somehow related to the capabilities of the purchasers, and are also outlined in earlier research (Uyarra, et al. 2014).

7.1.4 Factors influencing Norwegian public purchasers' attitude towards PPI

There are several important factors influencing public purchaser's attitudes towards PPI that has been put forward both in the literature, and also directly in the findings from this study.

From the PLS-SEM model of the study it was shown that it has an R Squared adjusted for ATTPPI with a value of 0,25 that implied that the 25% of the purchaser's attitude towards PPI can be explained by the elements in the model. The main elements are organizational support, the PPI prospects and the economic incentives.

And what has been found in this study is that it is of crucial importance to aim for even more strengthening of the purchaser's attitudes towards PPI. And it seems that the key in doing this

is to focus on the purchaser's perceptions of the prospects of PPI. It seems that in order to really elevate the quantity of PPI in Norway the purchasers must get more knowledge of a continuously growing evidence base of the prospects of PPI, and that this evidence base is commonly known by all purchasers. There are today several such evidence bases and in Norway we have <http://innovativeanskaffelser.no/>.

7.2 Limitations of study

There are several limitations of this study. First of all, there are the limitations of the researcher himself, as a supplier it has sometimes been hard to not be biased in my research. And also, the researcher's abilities to do actual research work and the fact that PLS-SEM was a technique that the researcher had not used before writing this thesis. PLS-SEM had also not been covered in any of academic classes that the researcher had done both at bachelor or master level and an effect of this was that it took a great amount of extra time learning the software and reading relevant literature. There was also the fact that for the sake of this study a free trial version of SmartPLS3 with limited amount of time of usage was used for analysis. So, the researcher did not have enough time to really get in depth of the seemingly great possibilities of PLS-SEM analysis. For a more optimal approach a full version of PLS-SEM should be made available to students using this software at Molde university college, and there should also be made at least a seminar on master level teaching this software and technique. This would also lead to the fact that the survey and buildup of the conceptual model would be more aimed towards PLS-SEM research from the start, as in this case it was more aimed at regular regression analysis in SPSS. But on the bright side this new analysis technique was really fascinating to use, and the supervisor for this thesis needs some applause for taking the extra time to teach this software to the researcher at a quick skype conference. Given more experience with this technique there would be created more constructs that could measure what had an effect of the purchaser's attitude towards PPI. This study seems to have too few constructs to assess in a really good way what has an effect on ATTPPI, the study shows just an adjusted R² value of 0,25 that is according to literature enough for business research, but I would for my own sake like to achieve a higher value. There is also the issue with the single item construct for INCENT. One option for increasing constructs reliability for INCENT could have been to add some questions that could have increased items related to one construct, as INCENT ended up as single-item constructs. And PLS-SEM does not provide the opportunity to measure the reliability to one-single construct. Future research should make more items to measure INCENT such as for instance questions regarding reporting procedures, applying procedures and other relevant issues regard the economic incentive structure.

There are also of course the time restraints when writing a master thesis. And the researcher had even more time restraints since there was carried out two different research methods both qualitative case studies and quantitative survey and PLS-SEM analysis. And because of the

time restraints there was not conducted any pre-studies to assess if both the interview guide, and the survey was in some way unclear or faulted. Because of the time restraints the analysis of interviews was carried out mostly manually, and no analysis software was used on the procedures. Given more time it would be desirable to go even more in depth of all the data from the six case studies as that could have been a thesis on its own. There is also of course the possibility of careless or biased answers from the informants both in the interview and the surveys. As mentioned in the chapter on survey design this is often a problem with this sort of research.

CHAPTER 8

Conclusion, recommendations, and future research

8.1 Conclusion, recommendations, and future research

It seems rather obvious that the most common reason that purchasers also in Norway focus on a risk averse approach to procurement is that they are concerned with the fact that there is a lot more hardship if they purchase an unknown solution without a demonstrated history that fails. Than to just continue buying the solutions that they already know works and has a demonstrated history. And without the proper mandate and training the purchasers will most likely continue in this fashion. Therefore, I will argue that there is a great need to put the proper mandate in place in order for the purchasers to be willing to lean more towards PPI that involves to some degree a riskier approach to purchasing and that the Norwegian program for supplier development continues their work with training towards public purchasers. It is also important to take into account that the main goal of the Norwegian law for public procurement is to promote effective usage of the Norwegian societies resources. It also demands that the public agencies act with integrity to achieve that the population has trust that public procurement is carried out in a socially beneficial way. Norwegian public procurement act § 1. And I will argue to a great length that if the purchasers are just focusing on buying the solution that has a demonstrated history, that they can detail-specify in the tender document, and then use lowest cost as the main selection criteria for assessing bids, then it is possibly not the most effective usage of the Norwegian resources if what is being purchased is yesterday's solutions.

By including more in the training on PPI about the differences between the two different types of PPI I will argue that this can lead to a better view of the prospects of PPI. If the public purchasers get a sound understanding that there does not need to be created something brand new in order for it to be an innovation, then hopefully more would aim to what one of the informants called "Knowledge based purchasing" where they include some of the techniques of PPI such as dialog and functional demands towards products or services that was already in the market today. Then hopefully this would lead to the fact that more and more public purchasers would try out the techniques in small scale at first, and this would strengthen the confidence leading to more and more innovation both from incremental innovation and the more game changers where this is possible. This again would strengthen the evidence base of successful outcomes that arguably can lead to more purchasers having a better view of the PPI prospects.

This is also a key element that is focused on from the European union as I elaborated on in the literature review. (European Commission 2014) And also, more evidence could have a great effect of changing the attitude according to cognitive dissonance theory (Festinger 1957) It would be nice to see in the future that there is put forward more tender-competitions on www.doffin.no that involved some sort of dialog as opposed to what Menon economics discovered of 1,4 % (Menon economics 2017).

It also seems appropriate to add more research on the shape and form of both the applying and reporting procedures for the available incentives as there seems to be something about these issues that are lowering the purchasers attitude regarding PPI as a whole.

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Appendix A: Interview guide

Intervjuer:

1. Send samtykkeskjemaet på forhånd via e-post.
2. IKKE Si Navn på Informant, Tittel, Firma, og dato i båndopptakeren.
3. Fortell dem at du vil ta opp mer enn en time av deres tid, og mindre hvis de trenger å gå. Spør dem om det er OK hvis vi gjør et oppfølgingsintervju for å fullføre de spørsmålene vi ikke kommer til i dag.
4. Informer om hvilken gruppering de tilhører.

Intro:

Etterspørsel er en kritisk drivkraft for innovasjon blant leverandører i enhver økonomisk ramme, og tidligere studier har konkludert med at offentlige anskaffelser spiller en viktig rolle for å fremme innovasjon. Målet med både den nye norske loven og det nye EU-direktivet fra 2014 er blant annet å gi plass til mer innovasjon som oppstår fra denne etterspørselen. Men vi ser fortsatt at offentlige innkjøpere ofte har en tendens til å anvende en risikoavvikende tilnærming til innkjøp. Til tross for EUs nye anskaffelsesdirektiv fortsetter offentlige innkjøpere å legge liten vekt på å prioritere innovative løsninger. *(kun 1,4% av alt som er utlyst på doffin har markedsdialog (Menon economics 2017))*

Denne studien tar sikte på å bygge videre på retningslinjene som eksisterer for å sikre at offentlige anskaffelser av innovasjon er mer vellykkede, basert på de offentlige innkjøpernes meninger om IOA i Norge. Studiet bygger på eksisterende teori og forskning på feltet, og tar sikte på å bidra til litteraturen. Mer kunnskap om denne kan fungere som et supplement ved utforming av retningslinjer for beste praksis for å sikre suksess med implementering av IOA. Har du spørsmål før vi begynner?

INNLEDNING SPØRSMÅL

Kan du beskrive din rolle i organisasjonen?

Hvor mange år har du jobbet med offentlige anskaffelser?

Hvor mange ansatte er involvert i innkjøp i organisasjonen din?

Har dere forankret innovative offentlige anskaffelser i deres strategi dokumenter?

Kan du beskrive hvor mange anskaffelser dere har gjennomført hvor dere har hatt markedsdialog **før** gjennomføring av selve innkjøpet?

Kan du gi noen eksempler på innkjøp som du har vært involvert i som har vært nyskapende eller innovative?

[Lag notater og henvisning til disse utgangspunktene for å gjøre intervju mer tilpasset]

Spørsmål til innkjøper som har implementert IOA

Disse spørsmålene tar sikte på å fange driverne, kritiske suksessfaktorer og utfall av implementering av IOA.

Nøkkelspørsmål (suppleres med oppfølgingsspørsmål avhengig av svarene som er oppgitt)

1. Hva var drivkraften til at din organisasjon ønsket å implementere IOA?
2. Hva synes du er de kritiske suksessfaktorene for implementering av IOA?
3. Fra din erfaring hva vil du si er hindringene for å implementere og å lykkes med IOA?
4. Tror du at framgangsmåten med IOA er egnet for å skaffe seg alle typer varer og tjenester?
Ja Nei? Kan du forklare hvorfor?
5. Hvis en innkjøpssjef som aldri har gjort IOA før tilnærmer seg deg for å få råd, hvilke feil / fallgruver vil du råde ham / henne til å unngå?
6. Kan du peke på eventuelle fordeler som organisasjonen din har oppnådd etter å ha implementert IOA?
7. Har du noe å tilføre som du føler vi ikke har fått tatt opp?

Spørsmål til intervjuer som ikke har implementert IOA

Disse spørsmålene tar sikte på å fange driverne, kritiske suksessfaktorer og utfall av implementering av PPI.

Nøkkelspørsmål (suppleres med oppfølgingsspørsmål avhengig av svarene som er oppgitt)

1. Hva er grunnlaget for at dere ikke har implementert IOA i full grad hittil?
2. Ønsker dere å implementere IOA i full grad i nær fremtid? Ja Nei? Kan du forklare hvorfor?
3. Hva føler du er de kritiske suksessfaktorene for implementering av IOA?
4. Tror du at framgangsmåten med IOA er egnet for å skaffe seg alle typer varer og tjenester?
Ja Nei? Kan du forklare hvorfor?
5. Har du noe å tilføre som vi ikke har fått tatt opp?

Oppfølgingsspørsmål om de kritiske suksessfaktorene for implementering av IOA

Bedre statlige incentivstrukturer som reduserer risikoen involvert for det offentlige med sikte på å gjennomføre IOA? Ja Nei? Hva er årsakene til det??

Å involvere markedet foran den faktiske konkurransen? Ja Nei? Hva er årsakene til det??

Å begynne å definere behovene tidligere, ved å tenke mye bredere enn vanlig? Ja Nei? Hva er årsakene til det??

Å involvere flere mennesker når dere definerer de faktiske behovene? Ja Nei? Hva er årsakene til det??

Å sjekke hva markedet faktisk kan tilby i dag, samt å sørge for at markedet får en god forståelse for ditt behov? Ja Nei? Hva er årsakene til det??

Å bruke funksjonelle krav i stedet for spesifiserte løsninger i kravspesifikasjonen? Ja Nei? Hva er årsakene til det??

Å evaluere tildelingen av kontrakten basert på den økonomisk mest fordelaktige anbudet? Ja Nei? Hva er årsakene til det??

Oppfølgingsspørsmål om barrierer for PPI

Den lave tilgjengeligheten av incentivstrukturer som reduserer risikoen involvert med IOA, er en barriere for implementering av IOA? Ja Nei? Hva er årsakene til det??

Liten grad av dialog med leverandører i anbudsfasen er en barriere for implementering IOA? Ja Nei? Hva er årsakene til det??

Gjeldende lover og forskrifter i Norge? Ja Nei? Hva er årsakene til det??

Vil du si at innkjøpers kompetanse om hva som driver innovasjon er en barriere for implementering av IOA? Ja Nei? Hva er årsakene til det??

At små og mellomstore bedrifter har vanskeligheter med å delta i konkurranser på grunn av prekvalifiseringsprosedyrer og betingelser? Ja Nei? Hva er årsakene til det??

Detaljdefinerte kravspesifikasjoner som beskriver løsningen, i motsetning til funksjonsbaserte spesifikasjoner? Hva er årsakene til det??

Vil du si at det er en utfordring å ta stilling til hva som er tilgjengelig i markedet, eller å ta stilling til hva markedet faktisk kan klare å levere hvis de får bruke sin fagkompetanse? Ja Nei? Hva er årsakene til det??

Utfordring å kunne forstå dine faktiske behov, og de forbedringene som er mulige gjennom innovative anskaffelser? Ja Nei? Hva er årsakene til deg??

Vil du si at det er utfordrende å kunne implementere den faktiske innovasjonen og endre organisasjonsprosedyrene, rutinene og ha den faktiske kapasiteten som trengs for å gjøre det? Ja Nei? Hva er årsakene til det??

Appendix B: Survey questions

Masteroppgave Høgskolen i Molde - Innovative Offentlige

Anskaffelser

Hei.

Jeg håper du har mulighet til å svare på min spørreundersøkelse som er et viktig ledd i min masteroppgave om offentlige anskaffelser. Du har blitt tilfeldig utvalgt på bakgrunn av at du har kunngjort konkurranse på www.doffin.no. Selve spørreundersøkelsen vil ikke ta mer enn 3 til 5 minutter å gjennomføre, og det er helt anonymt for deg som informant.

Min masteroppgave omhandler innovative offentlige anskaffelser (IOA) for å fremme innovasjon som følge av etterspørsel fra offentlige sektor. Et ledd i oppgaven er å gjennomføre en Survey undersøkelse. Dette for å ta stilling til hva som er signifikante hindringer for implementering av innovative offentlige anskaffelser, og hva som er suksessfaktorer for å lykkes med akkurat dette.

Det er like viktig for oppgaven at informanter med lite erfaring med IOA svarer, som at informanter med mye erfaring med IOA svarer.

I spørreundersøkelsen er det primært spørsmål som skal rangeres på en skala fra 1 til 5.

Din identitet vil holdes skjult.

[Les om retningslinjer for personvern.](#) (Åpnes i nytt vindu)



1) Hvor erfaren er din kommune med innovative offentlige anskaffelser?

Ja Nei

Har dere forankring for innovative offentlige anskaffelser i deres strategidokument?

Har dere gjennomført 3 eller mer innovative offentlige anskaffelser?



2) Hvordan stiller du deg til følgende utsagn om innovative offentlige anskaffelser? Skala fra en til fem hvor: Sterkt uenig = (1) Uenig = (2) Hverken enig eller uenig = (3) Enig = (4) Helt enig = (5)

	1	2	3	4	5
Å utføre innovative offentlige anskaffelser gir meg en stor mulighet for personlig profesjonell utvikling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jeg stiller meg veldig positivt til innovative offentlige anskaffelser	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Å utføre innovative offentlige anskaffelser er en spennende oppgave	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>



3) Det er tilgjengelig gode nok incentiv strukturer som senker den finansielle risikoen involvert med å sikte på innovative offentlige anskaffelser

1 2 3 4 5

Sterkt uenig = (1) Uenig = (2) Hverken enig eller uenig = (3) Enig
= (4) Helt enig = (5)



4) Jeg har mottatt tilstrekkelig opplæring i innovative offentlige anskaffelser

1 2 3 4 5

Sterkt uenig = (1) Uenig = (2) Hverken enig eller uenig = (3) Enig
= (4) Helt enig = (5)



5) Det er forankret sterk støtte for innovative offentlige anskaffelser fra mine ledere

1 2 3 4 5

Sterkt uenig = (1) Uenig = (2) Hverken enig eller uenig = (3) Enig
= (4) Helt enig = (5)



6) Hvordan stiller du deg til følgende utsagn om effekten av innovative offentlige anskaffelser? Skala fra en til fem hvor: Sterkt uenig = (1) Uenig = (2) Hverken enig eller uenig = (3) Enig = (4) Helt enig = (5)

	1	2	3	4	5
Innovative offentlige anskaffelser er den beste tilnærmingen for å oppnå merverdi for pengene	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Innovative offentlige anskaffelser er den beste tilnærmingen for å gjøre det mulig for kommunen å levere tjenester av høy kvalitet til folket	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Innovative offentlige anskaffelser er den beste tilnærmingen for å garantere leverandørutvikling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



7) Hvor viktig føler du at det følgende er for å oppnå suksess med innovative offentlige anskaffelser? Veldig uviktig = (1) Uviktig = (2) Hverken viktig eller uviktig = (3) Viktig = (4) Veldig viktig = (5)

	1	2	3	4	5
Tilgjengelige offentlige incentiv strukturer som senker den finansielle risikoen involvert med sikte på innovative offentlige anskaffelser?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mer opplæring i innkjøpsprosessen for innovative offentlige anskaffelser?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forankringer for innovative offentlige anskaffelser i ledelsen i kommunen på strategisk nivå?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



8) Føler du at noe av det følgende er hindringer for gjennomføring av innovative offentlige anskaffelser? Sterkt uenig = (1) Uenig = (2) Hverken enig eller uenig = (3) Enig = (4) Helt enig = (5)

	1	2	3	4	5
At det tar lenger tid å gjennomføre enn en tradisjonell anskaffelse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
For liten bruk av leverandørdialog er en hindring for å lykkes med innovative offentlige anskaffelser?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Frykt for å gjennomføre denne typen prosesser som følge av at man er ukjent med metodikken?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Desentralisert innkjøp i organisasjonen er en hindring for implementering av innovative offentlige anskaffelser?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[Send]

100 % fullført

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