

# Exploring the conditional purchasing technique: Why and how should public procurers in Europe use this technique?

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## **ABSTRACT,**

This paper explores why and how the conditional purchasing technique should be used by European public procurers. The conditional purchasing technique is a relatively new procurement technique that is developed to fulfill the wishes of buyers and suppliers as good as possible. It is a technique whereby a tender is divided into separate lots, and based on these lots, buyers as well as suppliers can impose conditions on the final outcome. Recently, some features of the conditional purchasing technique have been introduced in the 2014/24/EU Directive on public procurement. The private sector uses the conditional purchasing technique frequently, but little is known about its use in the public sector. Therefore, the current use of the conditional purchasing technique in the public sector is investigated by analyzing public tenders from the Netherlands, Germany and Belgium and by interviewing public procurement experts. Furthermore, conditional purchasing isn't commonly accepted terminology. Several terms that are used for (features of) the technique are identified. Based on the identified terms, a critical literature review is conducted to provide a clear overview of the existing research on the conditional purchasing technique. A difficulty is that there are discussions if the conditional purchasing technique is legally allowed. To provide an answer on this question, Directive 2014/24/EU on public procurement and its implementation in the Netherlands, Germany and Belgium is analyzed. Public procurement experts also give their opinion about this difficulty. Finally, interviews with the CEO of Keelvar and a consultant of TradeExtensions are held. Both companies sell strategic sourcing optimization software. This software is able to solve extremely complex sourcing problems, such as problems that arise from using the conditional purchasing technique with many lots, bidders and conditions. This paper recommends public procurers in Europe to reconsider their procurement strategy, and to use the conditional purchasing technique more often. The reasons for this recommendation are extensively discussed. Furthermore, this paper identifies several potential pitfalls for public procurers who want to use the technique. It is explained how those potential pitfalls can be tackled.

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## **Keywords**

Conditional purchasing, public procurement, Directive 2014/24/EU on public procurement, combinatorial bidding, package bidding, strategic sourcing optimization software.

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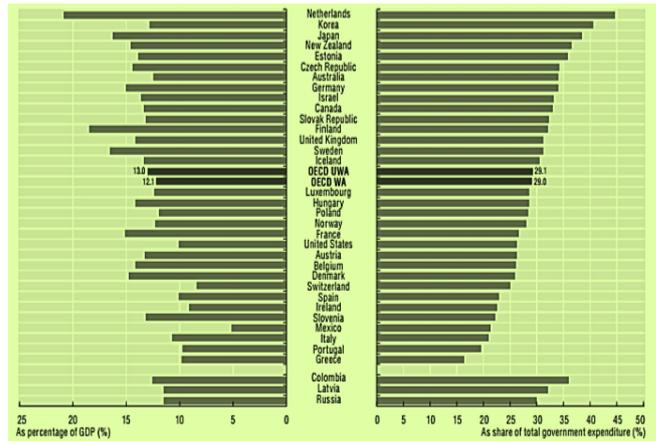
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# 1. INTRODUCTION

There are relatively new procurement techniques, which are increasingly used by the private sector, but which are not (often) used in the public sector. One of those techniques is the conditional purchasing technique. Recently, this technique has been partly introduced in the European Directive 2014/24/EU on public procurement. However, the term “conditional purchasing” isn’t explicitly mentioned. Only specific features of the conditional purchasing technique are discussed. Conditional purchasing is a technique that can be used when a tender is divided into different lots. Buyers as well as suppliers can impose conditions on the final outcome based on those lots. An example of a condition from the perspective of a buyer is: a bidder can be awarded at most three lots. Logically, conditions limit the number of possible award outcomes. There isn’t a lot of knowledge available about the conditional purchasing technique. For example, searching at the term “conditional purchasing” at WebOfScience or Scopus gives zero results. However, the term “conditional purchasing” isn’t commonly accepted terminology. Terms like multi-contract / combinatorial / expressive – procurement / purchasing / bidding are used for (features of) the conditional purchasing technique. This makes it less surprising that the term gives zero results. Henceforth, the term “conditional purchasing” is used for the above described technique.

One country where conditional purchasing is gaining increasing attention is in the Netherlands. Recently, several papers have been published. An interesting paper is written by Manunza, Lohmann, Uenk, & Telgen (2015), who conclude that it is an economically sensible technique. This makes it even more curious that little information is available about the technique. One of the first articles that can be found about conditional purchasing is written in 2007 by Telgen & Idzenga. It is known that conditional purchasing is used in the private sector, but little knowledge is available about its use in the public sector. If public procurers want to use the conditional purchasing technique, they have to find the optimal allocation (for example by using software). Based on the interviews with public procurement experts, sub-optimal allocation techniques that are used in combination with the conditional purchasing technique are identified and illustrated in this paper. Public procurement experts also suggest that the sourcing process will change in the future. In the past, buyers defined the lots and the rules with which bidders have to comply. It is suggested that, in the future, buyers as well as bidders will be able to be more expressive. Then, bidders are, for example, able to express capacity limits and decide themselves which lots they want to combine in a package bid. Powerful software has to be developed to make it easy for buyers and bidders to be more expressive and to solve the potentially complex computational problem.

This paper tries to identify the link between public procurement and conditional purchasing. In the conclusion, it is explained why public procurers in Europe should use the technique more often. Public procurement is defined as the spending of public funds by public entities to obtain goods or services (Hunja, 2003). The importance of public procurement is illustrated in figure 1. Figure 1 shows total government procurement as a percentage of gross domestic product (GDP) and as a share of total government expenditures in 2013. For example, the Netherlands’ government procurement accounts for more than 20% of their GDP, and their government procurement accounts for nearly 45% of their total expenditures. This illustrates the importance of public procurement in the most obvious way. Public procurement are sometimes seen as a means for countries to translate policy objectives into concrete actions (Edler & Georghiou, 2007).



**Figure 1. Government procurement as a percentage of GDP and as a share of total government expenditures, in 2013. Copyright by OECD National Account Statistics (database).**

One of the advantages of conditional purchasing is that policy objectives are achieved more easily (Telgen et al., 2008; Grimm et al., 2006; Linthorst & Telgen, 2006). However, convincing public procurers to use a new procurement technique will probably be difficult if public procurers are already achieving their objectives. Private sector procurers are more easily to convince, because they are more incentivized to realize extra savings. The results of the interviews with public procurement experts show that public procurers are afraid to defend the use of a new procurement technique in a court. This is one of the reasons that public procurers stick to the accustomed procurement methods. As recognized by Nyeko & Kakwezi (2004), any company that has no excellent procurement function will make irregular and biased decisions with costly consequences to every entity. Achieving all objectives doesn’t automatically mean that a company has an excellent procurement function. This has to be recognized by public sector companies: public procurers should follow trends and have to improve their procurement strategy if necessary.

The example below illustrates how the conditional purchasing technique works and what the effect of a condition on the allocation of lots is. The buyer in the example has five different transports (e.g. lots) to award. Furthermore, there are five bidders (Aqua, Beta, Chery, Down & Eternity). This information is shown in table 1. As you can see, the buyer can simply award each lot to the bidder with the lowest bid if there is no condition present.

**Table 1. The bids for lot 1 to 5. No condition is applied and the winning bids are marked in white.**

Bids	Lot	Lot	Lot	Lot	Lot
Bidder	1	2	3	4	5
Aqua	900	1200	1100	1000	800
Beta	800	1700	1200	900	800
Chery	600	800	800	700	700
Down	900	1100	1800	1000	900
Eternity	800	900	900	800	600

As you can see total costs will be 3500 (600 + 800 + 800 + 700 + 600). Bidder Chery is awarded four lots, and bidder Eternity is awarded one lot. Suppose that the buyer wants to apply a condition: a bidder can be awarded two lots at most. The reason that the buyer has for this condition is that the company wants to limit dependency on potential suppliers. The allocation of lots to the bidders has to be changed, because bidder Chery is awarded four lots in the situation without the condition. Awarding four lots to one bidder violates the condition that a bidder can be awarded two lots at most.

As can be concluded from this small example, the buyer can't award the lots independently of each other when the conditional purchasing technique is applied. Table 2 shows the optimal allocation of lots to bidders if the condition "a bidder can be awarded two lots at most" is applied.

**Table 2: The bids for lot 1 to 5. The condition "a bidder can be awarded two lots at most" is applied and the winning bids are marked in white.**

Bids	Lot 1	Lot 2	Lot 3	Lot 4	Lot 5
Bidder	1	2	3	4	5
Aqua	900	1200	1100	1000	800
Beta	800	1700	1200	900	800
Chery	600	800	800	700	700
Down	900	1100	1800	1000	900
Eternity	800	900	900	800	600

As you can see, the allocation of lots to bidders has changed due to the introduced condition. The total costs for the buyer will be 3800 (800 + 900 + 800 + 700 + 600). This illustrates that introducing a condition increases the final costs. However, a buyer often considers more than the final costs.

This paper is structured in a clear way. At first, the (sub)-research questions and research design are introduced. Secondly, sub-optimal allocation techniques are illustrated to show how they have a negative influence on the final costs. Thirdly, a critical literature review is conducted to provide a clear overview of the existing literature about the conditional purchasing technique. Fourthly, a practical analysis is conducted to find out what's happening in practice with regard to conditional purchasing in the public sector. This practical analysis consist of two parts: (1) an analysis of 150 public tenders in the Netherlands, Germany and Belgium, and (2) seven interviews with public procurement experts. The interviews with public procurements are held to complement the literature review and to gather opinions from experts that have experience with the conditional purchasing technique. Fifthly, a legal analysis is conducted with regard to European Directive 2014/24/EU and its implementation in the Netherlands, Germany, and Belgium. In the end, the answers on the research questions are presented in the conclusion and discussion.

## 2. RESEARCH QUESTIONS AND RESEARCH DESIGN

### 2.1 Research Questions and Research Objectives

The previous section has shortly introduced the conditional purchasing technique. Furthermore, the rationale behind this paper was described. The research questions and research objectives are presented in this section. This research paper wants to answer the main research question and four sub-research questions. The sub-research questions are used to create a comprehensive answer on the main research question. The main research question is:

*Exploring the conditional purchasing technique: Why and how should public procurers in Europe use this technique?*

The four sub-research questions are:

- Which sub-optimal allocation techniques are used by public procurers in combination with the conditional purchasing technique?
- What are the advantages and disadvantages of the conditional purchasing technique?
- Is the conditional purchasing technique currently used in the public sector? Why do(n't) public procurers use the technique?

*- Analyzing the legal situation in the Netherlands, Germany, and Belgium: Is the conditional purchasing technique allowed according to Directive 2014/24/EU and country-specific regulation?*

Based on the (sub)-research questions, this research paper has the following research objectives:

- (1) Explaining why public procurers in Europe should use the conditional purchasing technique more often.
- (2) Identifying sub-optimal allocation techniques that are used in combination with the conditional purchasing technique.
- (3) Providing an overview of the existing literature about the conditional purchasing technique and terms related to this technique.
- (4) Investigating if the conditional purchasing technique is already used by public procurers in the Netherlands, Germany and Belgium.
- (5) Analyzing if the conditional purchasing technique is legally allowed in the Netherlands, Germany and Belgium.

### 2.2 Research Design

Several research techniques are used in order to find the answers on the (sub)-research questions. The sub-optimal allocation techniques are identified by interviewing the public procurement experts. They know what is happening in practice and, therefore, which techniques public procurers may use in combination with the conditional purchasing technique. Those techniques are explained and illustrated. To get an excellent overview of the advantages and disadvantages of the conditional purchasing technique, the existing literature is reviewed critically. This literature review is complemented by the results of the interviews with public procurement experts. In the literature review, the division of tenders into lots is also extensively discussed. Results of interesting research papers about the division of contracts into lots and the conditional purchasing technique are combined. This will make readers more familiar with the division of tenders into lots and the conditional purchasing concept in general. 50 public tenders with multiple lots in the Netherlands, Germany and Belgium are analyzed in combination with the experiences of the public procurement experts to find out if the conditional purchasing technique is used in the public sector during the last years. The results of the public tender analysis are presented in pie-charts and clear overviews. The legal analysis concerns an analysis of Directive 2014/24/EU and its implementation in the Netherlands, Germany and Belgium. The legal analysis wants to find out if the conditional purchasing technique is actually allowed. It consists of three parts: the division of tenders into lots, award criteria and the conditional purchasing technique. Award criteria are analyzed, because applying the conditional purchasing technique will certainly influence the award process. Although a condition isn't an award criteria, it certainly influences the award process. Besides the seven interviews with public procurement experts, two interviews with strategic sourcing optimization software companies are held. The software of those companies can solve extremely complex conditional purchasing problems. The two companies are: TradeExtensions from Sweden and Keelvar from Ireland. It is interesting to find out if public sector companies are using the software and what the key additions of the software are over using standard solvers as Excel. Furthermore, possible limitations and the potential of the strategic sourcing optimization software are investigated.

### 2.3 Added Value of the Paper

This paper wants to explain why public procurers in Europe should use the conditional purchasing technique more often. Little information is currently available about the conditional purchasing technique. It is known that the conditional purchasing

technique is used in the private sector, but about its use in the public sector is little information available. Furthermore, it is doubtful if the technique is fully legally allowed. Directive 2014/24/EU introduces features of the conditional purchasing technique separately. However, the term “conditional purchasing” isn’t explicitly mentioned. This could also be because it isn’t commonly accepted terminology. The different terms that are used for (features of) the conditional purchasing technique are identified. The research results of those different identified terms are combined.

This paper adds to the existing academic research in several ways. Firstly, this paper explains why public procurers in Europe should use the conditional purchasing technique more often. Secondly, sub-optimal allocation techniques that can be used in combination with the conditional purchasing technique are identified and illustrated. Thirdly, different terms for (features of) the conditional purchasing technique are identified, and the research results of those terms are combined. Fourthly, public tenders in the Netherlands, Germany and Belgium are analyzed and based on the results of this analysis and interviews with public procurement experts, it can be concluded if the conditional purchasing technique is currently used (often) in the public sector. Fifthly, Directive 2014/24/EU on public procurement and its implementation in the Netherlands, Germany and Belgium is analyzed to find out if the technique is legally allowed.

### 3. SUB-OPTIMAL ALLOCATION TECHNIQUES

It is doubtful if all public procurers are able to apply the conditional purchasing technique without using strategic sourcing optimization software. Strategic sourcing optimization software can be acquired to hide the knowledge shortage of some public procurers. However, the investment that is needed to use the software for a specific project can’t always be justified by the extra savings. Then, public procurers should have the knowledge themselves to use the conditional purchasing technique. Public procurers can also choose to use another procurement technique. However, from the interviews with the public procurement experts, it can be concluded that the conditional purchasing technique is definitely useful for the public sector. Therefore, it is advisable to at least consider the technique for projects. Public procurement experts suggested that public procurers use certain sub-optimal allocation approaches to hide their knowledge shortage of the conditional purchasing technique. Using the conditional purchasing technique with a sub-optimal allocation approach can seriously harm the company. Three techniques that could be used to allocate homogenous (equal volume) lots are identified and illustrated below: (1) the sequential approach, (2) the biggest bid difference approach, and (3) the lowest bid approach. It should be noted that these sub-optimal allocation techniques can also be used with heterogeneous lots, but the following techniques are only applicable to heterogeneous lots: (1) limiting the number of lots for which a bidder can bid beforehand, and (2) allocating the highest volume lot first. Consider table 3 (with homogeneous lots) below that was presented earlier with the condition “a bidder can be awarded two lots at most”. This table shows the optimal allocation:  $(800 + 900 + 800 + 700 + 600) = 3800$ . Below it will be illustrated how bad the sub-optimal allocation techniques are. You can imagine that, since the allocation techniques don’t lead to the optimal allocation in a small example, companies will experience more negative consequences if there are more bidders, lots and conditions. If the number of bidders, lots and conditions increase, the number of possible final outcomes also increase. Often, there is only one optimal outcome. Therefore, the chance to arrive luckily at the optimal outcome is lower if there are more bidders,

lots and conditions if you use one of the sub-optimal allocation techniques.

**Table 3: The bids for lot 1 to 5. The condition “a bidder can be awarded two lots at most” is applied and the winning bids are marked in white.**

Bid	Lot	Lot	Lot	Lot	Lot
Bidder	1	2	3	4	5
Aqua	900	1200	1100	1000	800
Beta	800	1700	1200	900	800
Chery	600	800	800	700	700
Down	900	1100	1800	1000	900
Eternity	800	900	900	800	600

The sequential approach starts with allocating the first lot, then the second lot, and so on. Table 4 shows the allocation of lots to bidders if you use the sequential approach in combination with the condition “a bidder can be awarded two lots at most”. The total costs for the buyer are:  $(600 + 800 + 900 + 800 + 800) = 3900$ . The total costs for the buyer rise with 100 in comparison with the optimal allocation (3800).

**Table 4: The bids for lot 1 to 5. The condition “a bidder can be awarded two lots at most” and the sequential approach are applied. The winning bids are marked in white.**

Bid	Lot	Lot	Lot	Lot	Lot
Bidder	1	2	3	4	5
Aqua	900	1200	1100	1000	800
Beta	800	1700	1200	900	800
Chery	600	800	800	700	700
Down	900	1100	1800	1000	900
Eternity	800	900	900	800	600

The biggest bid difference approach starts with allocating the lot that has the biggest difference between the best offer and the runner up (e.g. the second best offer), then the lots with the second biggest bid difference is allocated, and so on. If the bid difference of two lots is the same, then the lot with the lowest bid will be allocated first (e.g. a lot with 600 as the lowest bid will be preferred over a lot with 700 as the lowest bid). Table 5 shows the allocation of lots to bidders if you use the biggest bid difference approach in combination with the condition “a bidder can be awarded two lots at most”. The total costs for the buyer are:  $(600 + 900 + 1100 + 700 + 600) = 3900$ . The total costs for the buyer rise with 100 in comparison with the optimal allocation (3800).

**Table 5: The bids for lot 1 to 5. The condition “a bidder can be awarded two lots at most” and the biggest difference approach are applied. The winning bids are marked in white.**

Bid	Lot	Lot	Lot	Lot	Lot
Bidder	1	2	3	4	5
Aqua	900	1200	1100	1000	800
Beta	800	1700	1200	900	800
Chery	600	800	800	700	700
Down	900	1100	1800	1000	900
Eternity	800	900	900	800	600

The lowest bid approach starts with allocating the lot that has the lowest bid from all the lots. If there are two lots with the same lowest bid, then the lot with the biggest difference between the lowest bid and the second lowest bid will be allocated first. Table 6 shows the allocation of lots to bidders if you use the lowest bid approach in combination with the condition “a bidder can be awarded two lots at most”. The total costs for the buyer are:  $(600 + 1100 + 900 + 700 + 600) = 3900$ . The total costs for the buyer rise with 100 in comparison with the optimal allocation (3800).

**Table 6: The bids for lot 1 to 5. The condition “a bidder can be awarded two lots at most” and the lowest bid approach are applied. Winnings bids are marked in white.**

Bid	Lot 1	Lot 2	Lot 3	Lot 4	Lot 5
Aqua	900	1200	1100	1000	800
Beta	800	1700	1200	900	800
Chery	600	800	800	700	700
Down	900	1100	1800	1000	900
Eternity	800	900	900	800	600

## 4. LITERATURE REVIEW

### 4.1 The Division of Tenders into Lots

It is required for buyers to divide tenders into lots if they want to apply the conditional purchasing technique. Dividing tenders into separate lots means factually that a tender is divided into small pieces (Perry, 2011). Reconsider the example in the introduction in which a buyer divided a tender consisting of five different transports into five different lots. The division into lots has gained attention for a long time (Boudreaux & Holcombe, 1989), but during the last years it is gaining increasing attention again, because more knowledge becomes available about the possible advantages of dividing contracts into lots. The increasing interest in dividing tenders into lots is stimulated by the European Union, since dividing tenders into lots is extensively discussed in the European Directives. In the Directives, the European Union encourages public procurers to divide tenders into lots. Some recent papers call the decision to divide tenders into lots (or not) “one of the main choices in public procurement nowadays” (Hill, 2016; Grimm, Pacini, Spagnolo & Zanza, 2006). Carpineti, Piga & Zanza (2006) found in a survey that, even in 2006, it was common practice to divide contracts into lots. This demonstrates that institutions consider it for a long time. In practice, the division of tenders into multiple lots has received plenty of support by procurement stakeholders (Anchustegui, 2015).

But what does the existing literature consider as the advantages of dividing tenders into lots? At first, bidders may not be able to complete the whole tender due to limited capacity. When a tender is divided into separate lots, more bidders are able to bid for the tender (Lundberg & Lunander, 2012; Telgen, 2003; Sandholm, 2007). Secondly, the buyer wants to have more than one supplier to complete the tender (Telgen, 2003). When a tender is divided into separate lots, the buyer is able to allocate different lots to different bidders. By having more suppliers, dependency on suppliers could be limited (Telgen, Idzenga & Uenk, 2008).

Another possibility is that a buyer wants different suppliers with different market specialisms to complete a tender. Consider a tender in which a gym has to be built and whereby the exploitation of this gym is included in the tender. There is probably no company available who is willing to do both. If the tender isn’t divided into lots, a company who will build the gym and a company who will exploit the gym have to form a consortium. This isn’t required if the tender is divided into separate lots, because building the gym and exploiting the gym could be allocated to bidders in separate lots. Thirdly, companies could be able to better achieve policy objectives by using the procurement function (Telgen et al., 2008; Grimm et al., 2006; Linthorst & Telgen, 2006). An example of a policy objective could be: receiving more bids from SMEs (Carpinetti et al., 2006). Fourthly, more competition between bidders is supported (Telgen et al., 2008; Lunander & Lundberg, 2012; Carpinetti et al., 2006). Because of the extra competition, dividing contracts into lots may be more cost efficient (Telgen et al., 2006). Fifthly, in 2015, a very interesting survey was conducted by the Organisation for Economic Co-operation and Development (OECD). In this survey, attracting new entrants to the market was also mentioned as a reason to divide tenders into lots. New entrants become more interested in a tender when it is divided into separate lots, because they think that they have more chance to win (part of) the tender.

However, existing literature also identifies potential pitfalls for buyers. At first, it may be the case that the buyer doesn’t consider the market possibilities (Telgen, 2003). Then, dividing tenders into separate lots may result in an sub-optimal outcome for the buyer. Secondly, buyers may divide the tender in a low amount of lots to make it easy to assign the separate lots to different suppliers (Telgen, 2003). This can result in buyers who don’t experience any advantage of dividing tenders into separate lots. Thirdly, Hill (2016) recognizes the toughness of making the correct decision. When the decision is wrong to divide (or not) a tender into separate lots, negative consequences could be: lack of competition, suboptimal tender outcome, possible collusive behaviour by suppliers, and failure to achieve policy objectives. An advice for buying companies is to train public procurers to learn to work with the division of tenders into separate lots.

Some authors regard the decision to divide tenders into separate lots as a balance between two extremes. Grimm et al. (2006) considers the decision as a matter of choosing for the economies of scale that are derived from the use of a single contract or choosing for the possible diversity of suppliers which are the result of dividing the tender in multiple lots. Hill (2016) stresses that the decision to divide a tender into different lots has to be

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#### Advantages of dividing tenders into separate lots as identified by the existing literature

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1. The limited capacity problem of bidders disappears.
  2. The buyer wants to have more than one supplier.
  3. Companies could be able to better achieve their policy objectives.
  4. Supporting competition between bidders.
  5. Attracting new entrants to the market.
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#### Potential pitfalls for buyers of dividing tenders into separate lots as identified by the existing literature

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1. The buyer doesn’t consider the market possibilities.
  2. Buyers divide the tender in a low amount of lots to make it easy to assign lots.
  3. It is very tough to make the correct decision to divide tenders into separate lots or not.
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made for each specific tender: it depends, to a large extent, on the specific market characteristics of the market concerned and the object of the contract. Market characteristics that may impact the decision to divide a tender into different lots are, for example, the number of capable suppliers in the market concerned and how risky it is to be dependent on one supplier. The decision could also be seen as follow: on the one hand, selecting one supplier for the whole contract reduces efforts in evaluating, selecting, and contracting suppliers, but a limited number of suppliers will be capable of doing that. On the other hand, selecting multiple suppliers will increase the workload in evaluating, selecting, contracting, and coordinating suppliers, but a high number of capable suppliers will be available. A buyer could minimize the risk of making a bad decision by doing extensive market research (Hill, 2016).

Grimm et al. (2006) identify two general prescriptions from literature when it comes to deciding in how many lots a tender should be divided. The first one is: the number of lots should be smaller than the expected number of participants. Otherwise, the participants could create an agreement about division of the lots. If the number of expected participants is higher than the number of lots, some participants would end with nothing. This should prevent the buyer from collusion by the participants. However, Grimm et al. (2006) stresses that the ability to sustain collusion isn't always positively affected by a higher number of lots. For example, collusive agreements may also be implemented through rotation schemes. This is highly applicable in regularly organized tenders. The second rule is: define at least one lot more than the number of incumbents and reserve it to new entrants. This rule will promote the participation of "new" bidders, which automatically results in increased competition. Furthermore, in a study of PricewaterhouseCoopers (PwC), which was commissioned by the European commission in 2014, it is empirically proven that the division of tenders into lots encourages SMEs to participate in public procurements. SMEs can compete more easily with bigger companies, because there are more contracts to win and the size of the contracts is smaller (Sandholm, 2007). However, Eßig and Glas (2016) found in an empirical study that the division of a tender into lots does not automatically lead to a higher success of participating SMEs. They found that other aspects of the tender have to be changed to improve SMEs bidding success. Loader (2013) found that the overly prescriptive qualification criteria, poorly written tender specifications and prohibitive resource requirements are barriers of SMEs bidding success.

In conclusion, you could say that a great amount of research has been conducted in this field. People ascribe potential to the division of tenders into lots. The existing literature mainly analyzes private sector companies, and reasons why they are using it. Fortunately, most of the identified advantages are also applicable to the public sector. This can make it very interesting for public sector companies to use the method. However, there are a number of potential pitfalls. Public procurers have to carefully consider these. It is advisable for public sector companies to provide training for public procurers and to stimulate public procurers to conduct extensive market research. Furthermore, it is interesting to see that not all empirical research shows positive results about the division of tenders into lots.

## 4.2 The Conditional Purchasing Technique

Conditional purchasing is a technique for when a tender is divided into separate lots, and where the award procedure (the assignment of lots to bidders) contains conditions that restrict the number of possible tender outcomes (Manunza et al., 2015). When using the conditional purchasing technique, the tender is divided into lots, and the buyer and/or bidder creates conditions based on the lots (Van der Horst & Schenk, 2009). Examples of

conditions from the perspective of the buyer are: a bidder can be awarded at most X lots, bidder A has to be awarded at least X lots, lot A and C have to be awarded to the same supplier, or the total number of bidders that can be awarded a lot is at most X. Examples of conditions from the perspective of the bidder are: the buyer can award at most X lots to my company, if my company is awarded at least X lots then I will provide a discount of X%, or if my company is awarded lot A and C then I will provide a discount of X%. The discount offers can also be based on awarded volume instead of number of lots. Note that these examples are only a small fraction of the possible conditions. The number of possible award outcomes are limited by the conditions (Telgen et al. 2008). The unique feature of the conditional purchasing technique is that the assignment of lots to bidders can't be done separately for each lot. The assignment of lots to bidders is a matter of mutual dependency (Manunza et al., 2015). This means that the allocation of lots has to be considered in combination. Bidders can in most cases decide themselves on how many lots they bid (Van der Horst & Schenk, 2009). However, bidding on less lots reduces the chance of winning lots. Since each additional condition reduces the number of possible award outcomes, conditions increase the final costs for the buyer. Therefore, buyers should only create necessary and useful conditions.

Traditionally, single bidding is applied instead of bidding with conditions (Lunander & Lundberg, 2012). However, conditional purchasing is increasingly being employed in both the private and public sectors as an alternative to simultaneous single contract bidding (Lunander & Lundberg, 2012). Conditional purchasing isn't used as often in the public sector as in the private sector. The value of the technique has already been acknowledged by the private sector (Manunza et al., 2015; Carpineti et al., 2006). Bichler, Pikošky & Setzer (2009) find different real-life cases in which the technique is successfully applied. The technique is used for a wide variety of items (Bichler et al., 2009; Carpineti et al., 2006; Maréchal & Morand, 2009). It ranges from office supply to chemicals. Bichler et al. (2009) find in their survey that the number of bidders are 10-20 on average, and the number of items may vary from 10 to 1000 items. By using conditions that limit the number of total suppliers, buyers must be sure that there are sufficient large companies to complete the tender and that these large companies are also willing to complete the tender. By using conditions that attract smaller companies, the bids will normally be more economically favourable for the buyer because of the more intense competition. However, more bids will definitely result in higher evaluating, selecting, contracting, and coordinating costs. When there are many lots, conditions, and bidders, the award procedure of conditional purchasing will be a very complex process to execute. Linear programming (LP) and integer programming (IP) are widely available to solve those problems. However, extremely complex problems couldn't be solved with LP/IP. Therefore, companies, like TradeExtensions and Keelvar, developed strategic sourcing optimization software. The existing literature identified a wide range of advantages of the conditional purchasing technique. Firstly, company policy objectives can be achieved more easily (Telgen & Idzenga, 2007). You can imagine that a state-owned enterprise has different objectives than a private sector company. Conditions can be used to make it more easy to achieve very different policy objectives. Secondly, SMEs are able to bid on more tenders and to compete with larger companies (Telgen & Idzenga, 2007; Telgen et al., 2008; Lunander & Lundberg, 2013; Sandholm, 2007). Of course, this is because the tender is divided into separate lots. Thirdly, the buyer wants to minimize or maximize the total number of suppliers (Manunza et al., 2015; Telgen et al., 2008). This can be achieved easily by using

conditions that limit or maximize the number of suppliers. Fourthly, lower costs due to possible cost synergies between lots (Telgen et al., 2008; Lunander & Lundberg, 2013; Sandholm, 2007; Lunander & Lundberg, 2012; Bichler et al., 2009). Cost synergies can be achieved when the lots are allocated in combination (e.g. package bids). Fifthly, the technique fosters creativity and innovation by the suppliers, which can result in big savings for buyers as well as suppliers (Sandholm, 2007). These effects are the results of the increased competition between bidders. Sixthly, the buyer can easily experiment with the trade-offs between conditions (Sandholm, 2007). They can change/add/delete conditions to see the effect on, for example, total costs by using what-if scenarios. The buyer is able to see what the effects are if certain conditions are added, because of a company policy that they want to achieve. Seventhly, decreased transaction costs for complex procurement negotiations in comparison with the alternatives that are used for allocations with multiple lots (Bichler et al., 2009). Eighthly, Bichler et al. (2009) finds that conditional purchasing prevents the bidders from facing the exposure problem. The exposure problem is the risk that bidders have in simultaneous bidding. In simultaneous bidding, the bidders can't use conditions, and thus no package bidding. If a bidder submits low bids for specific lots (there are cost synergies present between those lots for the bidder), because he assumes that he has the lowest bids on those lots. If the buyer doesn't award the specific lots with cost synergies to the bidder, then the bidder actually offered too low bids. The bidder may end up with lots for which he offered too low bids, because the possible cost synergies aren't present. This is the exposure problem. The exposure problem disappears if package bids are allowed. Some authors place remarks on the technique. Telgen et al. (2008) stresses that every situation is unique, and the buyer has to make sure that using the conditional purchasing technique fits with the situation. Lundberg & Lunander (2013) point out that cost synergies are stronger in the size of the individual lots rather than in the number of lots awarded. Furthermore, Telgen et al. (2008) identifies characteristics of a situation in which conditional purchasing is better applicable: a clearly specifiable product, sufficient capable suppliers, and the possibility to allocate in different lots. There are also challenges associated with using the conditional purchasing technique. Firstly, the potential complex computational problem in determining the winners (Nisan, 2006; Sandholm, 2007; Dimitri, Pacini, Pagnozzi & Spagnolo, 2006; Bichler et al., 2009). If X is the amount of separate lots, then  $2^X$ -

1 is the total number of possible bids that a supplier can submit. If Y is the number of different suppliers, then the number of possible offers that can be made is  $Y(2^X-1)$ . If the number of separate lots (X) is 8 and the number of suppliers (Y) is 9, the number of possible offers is  $(9) \times (2^8-1) = 2295$ . However, buyers can deal with this challenge by investing in strategic sourcing optimization software. Secondly, the technique is strategically very complicated (Lunander & Lundberg, 2013; Bichler et al., 2009). This can be the case when bidders place bids on separate lots and on combinations of lots. In fact, the bids on the separate lots compete with the bids on combinations of lots. Bidders may inflate their bids on single lots, or not even place a bid to increase the chance of winning a combination of lots. This may give an erroneous view of the possible cost synergies (Lunander & Lundberg, 2013). Empirical evidence for this phenomenon has also been found by Lunander & Lundberg (2013). Thirdly, the free-rider problem can occur (Dimitri et al., 2006; Maréchal & Morand, 2009). This means that small suppliers who are seeking for only a single contract, prefer to submit high prices, relying on other small suppliers to bid aggressively. A large company can win the competition with a package bid even if it would be more efficient to allocate the lots separately. As a result, the savings may be low for the buyer. To prevent the free-rider problem from happening, the "small" suppliers must agree with each other on how much to bid on the separate lots to beat the bid of the "large" supplier. As mentioned before, conditional purchasing isn't commonly accepted terminology. Lunander & Lundberg (2013) & Bichler et al. (2009) use the term "combinatorial procurement" in which bidders are allowed to submit bids on combinations of contracts (e.g. package bids). Sandholm (2007) uses the technique "expressive bidding" whereby the advantages of highly expressive human negotiation are combined with the advantages of electronic procurement. The expressive commerce software (Sandholm, 2007) can solve highly complex optimization problems. See figure 2 on the next page for the interface of the expressive bidding software. Lunander & Lundberg (2012) & Dimitri et al. (2006) use the term "multi-contract tendering" in which suppliers have the option to bid on contracts with the possibility to condition the prices in their bids on the outcome of other contracts. As mentioned in the beginning of this chapter, Manunza et al. (2015) call the technique conditional purchasing, which is a technique in which a tender is divided into separate lots, while the award procedure (assignment of lots to bidders) contains conditions that restrict the number of possible tender outcomes.

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#### **Advantages of the conditional purchasing technique as identified by existing literature**

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1. Achieving policy objectives more easily.
  2. SMEs are able to bid on more tenders to compete with larger companies.
  3. The buyer can easily minimize or maximize the total number of suppliers for the tender.
  4. Lower costs due to cost synergies between lots.
  5. Increased creativity and innovation by suppliers.
  6. Buyers can easily experiment with trade-offs between conditions.
  7. Decreased transaction costs for complex procurement negotiations in comparison with the alternatives.
  8. It prevents bidders from facing the exposure problem.
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#### **Challenges associated with the conditional purchasing technique as identified by existing literature**

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1. The potential complex computational problem in determining the winners.
2. The technique is strategically very complicated.
3. The free-rider problem can occur.

**Step 1. Select a rule and define the necessary parameters.**

- Require at least  suppliers
- Allow a maximum of  suppliers
- Require between  and  suppliers
- Award at least  dollars to
- Award at most  dollars to
- Favor  by  percent
- Award as much business as possible to
- Favor supplier by  percent if their score is greater than
- Exclude supplier with a score less than
- Use payment terms of  days. (Default is 60 days, applies everywhere)
- Use contract terms of  years. (Default is 3 years, applies everywhere)

**Step 2. Apply this rule**

- Everywhere.
- To the following:
  - All Items
  - to Item(s):
  - All Bid Rounds
  - to Bid Round:
  - All Product Groups
  - to Product Groups:
  - All Products
  - to Products:
  - All Sites
  - to Sites:
  - All Business Groups
  - to Business Groups:

**Figure 2: Interface of the expressive bidding software.**

## 5. PRACTICAL ANALYSIS

In this section, the results of the public tender analysis and the interviews are presented. In the Netherlands, Germany, and Belgium, 50 public tenders are analyzed for each country. In the Appendix (chapter 11), summarizing pie-charts and overviews of the analyzed public tenders can be found. The pie-charts and overviews are about the tender-IDs, the number of lots, if a supplier is allowed to bid on all lots, the award criteria, and the special conditions. It is tried to find tenders with a high number of lots. The use of the conditional purchasing technique is more likely if there are a high number of lots to award. The award criteria are analyzed to check if buyers tried to implement conditions via the award criteria. Furthermore, the interviews are held with seven public procurement experts from different countries. Two of these public procurement experts have a link with companies that sell strategic sourcing optimization software: TradeExtensions and Keelvar.. It is important to note that this analysis stands apart from the legal analysis. This analysis doesn't consider legal rules, but simply analyzes public tender documents. The presented information comes from the respective tender documents. The public tenders of the Netherlands are downloaded from <https://www.tenderned.nl/>. TenderNed is the online marketplace for the Dutch government's tenders. The public tenders of Germany and Belgium are downloaded from Tenders Electronic Daily (TED, <http://ted.europa.eu/>). TED is the online version of the 'Supplement to the Official Journal' of the EU, dedicated to European public procurement.

### 5.1 The Netherlands

In Appendix A (chapter 11.1), you can find the summarizing pie-charts and overviews of the 50 public tenders of the Netherlands. The public tenders are published between 2015 and 2017. It was easy to find tenders with a high number of lots. As can be seen in the pie-chart, only 20% of the tenders consisted of less than 5 lots, and 28% of the tenders consisted of 10 or more lots. You can find something remarkable in the pie-chart about if bidders are allowed to bid on all lots. Namely, in the tender documents of 48% of the tenders it wasn't mentioned if bidders were allowed to bid on all lots. For 50% of the tenders this was definitely allowed, and for only one tender the bidder wasn't allowed to bid on all lots. The buyer has to mention in the tender documents if a bidder isn't allowed to bid on all lots as required by the legal framework in Europe. Therefore, you can conclude that for the tenders in which it wasn't mentioned in the tender documents, the bidders were actually allowed to bid on all lots. This means that in 98% of the cases, bidders were allowed to bid on all lots. In the only case a bidder wasn't allowed to bid on all lots, the bidder could bid on 5 of the 20 lots.

A lot of variety can be detected in the award criteria. The economically most advantageous tender based on several criteria appears most often (46%), while also the price in combination with other criteria appears frequently (36%). Solely price as award criteria is used less often (18%). It was suggested that conditions could possibly be implemented via the award criteria. However, this doesn't happen in practice in the Netherlands. The award criteria that were used don't have a link with the conditional purchasing technique.

The last overview is about possible special conditions. Five special conditions can be found in the public tenders of the Netherlands. The special conditions that are found are: a bidder can be awarded at most X lots, a bidder can be awarded at most X lots and is thereby free to choose on which lots to bid, a bidder can be awarded at most X different regions, a bidder has to bid on all lots, and a buyer is allowed to use comparative assessment in the allocation of lots to suppliers. The conditions appeared only once or twice each. Therefore, the conclusion is simple for the Netherlands: features of the conditional purchasing technique such as the comparative assessment in the allocation of lots to suppliers (package bids) and some conditions are very occasionally used. However, it seems that the conditional purchasing technique is never fully applied.

### 5.2 Germany

In Appendix B (chapter 11.2), you can find the summarizing pie-charts and overviews of the 50 public tenders of Germany. The tenders were published between 2012 and 2017. As can be seen in the pie-chart, it was difficult to find tenders with a high number of lots. Only 12% of the tenders consisted of 5 or more lots. Remarkably, 78% of the tenders consisted of two or three lots. However, the highest number of lots that is found is 20. Bidders were almost always allowed to bid on all lots. This was in 96% of the tenders the case. In only two cases (4%), the bidders were restricted in the number of lots they can bid on. Both cases consisted of only two lots. For one of the tenders, the reason behind this restriction was mentioned: the lots were related to each other.

Little variety can be detected in the award criteria. In 72% of the tenders, the economically most advantageous tender based on several criteria was used. In 22% of the tenders, price in combination with other criteria was used. In only 6% of the cases, price was the only award criteria. The award criteria that were used don't have a link with the conditional purchasing technique. Special conditions were identified several times. The condition that appeared most often was: the framework agreement can have at most X participants. The following conditions appeared only once or twice: a bidder can be awarded at most X lots, making use of the procedure whereby the number of bidders is reduced in different phases, the buyer is allowed to use comparative assessment in the allocation of lots to suppliers, and at most X

bidders will be invited. These conditions are all allowed according to the law. The conclusion for Germany is also that some features of the conditional purchasing such as the comparative assessment in the allocation of lots to suppliers (package bidding) and some conditions are very occasionally used.

### 5.3 Belgium

In Appendix C (chapter 11.3), you can find the summarizing pie-charts and overviews of the 50 public tenders of Belgium. The public tenders were published between 2015 and 2017. The number of lots range from 2 to 19. As you can see in the pie-chart, only 10% of the tenders consisted of less than 5 lots, and 38% of the tenders consisted of 10 or more lots. The bidders were always allowed to bid on all lots. In 98% of the tender documents this was mentioned, and once it wasn't mentioned. The buyer has to mention in the tender documents if a bidder isn't allowed to bid on all lots. Therefore, you can conclude that for the tenders in which it wasn't mentioned, the bidders were actually allowed to bid on all lots. This means that bidders were always allowed to bid on all lots.

Little variety can be detected in the award criteria. In 70% of the tenders, the economically most advantageous tender based on several criteria is used. Price was in 28% of the cases used, and price in combination with other criteria was once used (2%). The award criteria that were used don't have a link with the conditional purchasing technique.

Six special conditions were detected: the framework agreement can have at most X participants, making use of the procedure whereby the number of bidders is reduced in different phases, at least X bidders are invited, at most X bidders are invited, a bidder can be awarded at most X lots, and the buyer isn't obliged to allocate all lots. The conditions appeared only once or twice. For Belgium, you can also conclude that only features of the conditional purchasing technique are used very occasionally.

### 5.4 Interviews

In total, seven interviews with public procurement experts are held. The interviews were held with the following persons: Dr. Holland, CEO of Keelvar (Ireland), Dr. Albano, head of research of Consip, which is the national central purchasing body (Italy), Prof. dr. Ancarani (Italy), Dr. ir. De Boer (Norway), Prof. dr. Eßig (Germany), Prof. dr. Lunander, consultant of TradeExtensions (Sweden), and Prof. dr. Lundberg (Sweden).

The question about the use of the conditional purchasing technique in the public sector gave varying responses. Keelvar provided conditional tendering services to government bodies in Ireland, and declared that they've never lost a customer in the public sector. However, it was noted that it is a difficult process to educate public procurers about the possible value of the technique. Furthermore, it was mentioned that public tendering was a slow process. In Italy, Consip uses geographical lots quite often. The public procurement experts in Norway, Sweden, and Germany know the technique, but the use of the technique was seen as very uncommon. TradeExtensions never sold their software to public procurers, but they offered their services to them. Hereby, they were trying to convince public procurers of the value of the technique. In conclusion, you can say that the technique is applied only occasionally (if this is the case at all in a country).

The public procurement experts illustrated several practical examples in which the conditional purchasing technique is used or can be used. At first, the conditional purchasing technique can be used for transports, because each company is good on certain routes and poor on others. Companies differ in their strengths and weaknesses. For air freight, it may be the case that an airline offers the route Paris-> Milan, but not Milan->Paris. Therefore it

is smart to divide tenders into lots, and to let bidders themselves decide on which lots they want to bid. If a bidder is awarded lots they actually don't want, they often have to subcontract those lots. Secondly, TradeExtensions worked with the Danish Road Administration for the maintenance of their roads and used the conditional purchasing technique. Buyers and bidders were able to condition in both ways. In total 35 contracts (lots) were sold. Thirdly, the conditional purchasing technique was used for providing paper and plastic materials in a hospital. In total 140+ items were divided into 40 different lots. Bidders had to submit their prices on a list, and they offered X% discount if their allocated volume was higher than X%. Fourthly, conditional purchasing can be used for cleaning services at different locations. The different locations have different square meters. Bidders can offer discounts based on the volume and they could condition their maximum capacity.

But what restricts public procurers from using the technique more often according to the public procurement experts? Several reasons are often mentioned. Firstly, public procurers don't care enough of the money they spend (they are not very restricted to their budget). They lack incentives to try improve their procurement strategy. Public procurers only get punished if something goes wrong and why should you change your procurement strategy if it was successful the last time? Secondly, public procurers lack the knowledge to use such advanced procurement techniques. If you use the conditional purchasing technique, a complex formulation and optimization problem may arise. Public procurers may lack the knowledge about how to formulate and solve the conditional purchasing problems. Thirdly, the award procedure has to be announced beforehand, and it seems that this extra workload is high in comparison to what is regarded as normal now. Fourthly, lawyers who create the Directives on public procurement and country-specific regulation don't have the knowledge and way of thinking of economics and mathematicians. This can be the reason for why techniques like the conditional purchasing technique aren't explicitly mentioned in the Directive. Because the term "conditional purchasing" isn't explicitly mentioned, it is unclear if the use of the technique is fully legally allowed.

Nevertheless, public procurement experts see many advantages which should convince public procurers to use the conditional purchasing technique more often. Firstly, conditional bids of smaller companies can compete against aggressive package bids of larger companies. Smaller bidders can bid for all lots and simultaneously condition their maximum capacity. Furthermore, larger companies don't have to take the whole tender, and to subcontract part of the tender themselves. Instead of that, they are now able to bid only for the lots they want. In the end, the larger and smaller companies are both content, and the buyer has better bids. Secondly, buyers and bidders can be more expressive. For example, bidders can submit package bids and condition capacity limits, while the buyer can use conditions to limit the number of bidders that can be awarded a contract. Thirdly, the savings for the buyer will increase by using the conditional purchasing technique in comparison with other techniques that are used when tenders are divided into lots (for example the sequential allocation technique). Fourthly, the conditional purchasing technique supports increased competition. For example, if the buyer uses the condition: a bidder can be awarded at most three lots if there are 20 lots to allocate, then new entrants and SMEs definitely think they make a chance to win at least one lot.

Public procurement experts also identified several potential disadvantages of using the conditional purchasing technique. Firstly, the technique is regarded as highly sophisticated. Do buyers and bidders completely understand the technique? On the other hand, it is doubtful if it is easier for bidders to submit single

bids instead of package bids, because, as a bidder, you don't know how many lots you will win. Secondly, legal experts doubt about if it is legally allowed to use the technique, and public procurers do definitely not want to defend the use of a new procurement technique in a court. For example, using conditions might be seen as treating bidders unfair. Thirdly, if the participation of (smaller) firms is lower than expected, the extra costs of using such a technique might not be outweighed by the benefits.

It was interesting to see what public procurement experts thought about which situation fits better with the conditional purchasing technique. It depends on market characteristics (e.g. market structure) is a frequently given answer. For example, markets with a lot of potential bidders better fit with the technique, because competition can be easily supported. Furthermore, it was noted that if the competition is already intense, the benefits of using the technique may not outweigh the extra costs. Also, homogeneous products are easier to define in terms of quality etc. and therefore regarded as better suited for the conditional purchasing technique. However, the public procurement experts also stress that it is also possible to use the conditional purchasing technique in combination with heterogeneous products.

Public procurement experts were also asked about their thoughts about dividing tenders into lots in general since this is strongly encouraged by the European Union in the Directives. Public procurement experts agreed that most of the time dividing tenders into lots is validly encouraged by the European Union. However, they stress that in some situations, dividing tenders into lots doesn't make any sense. Furthermore, it is stressed that the market instead of the buyer has to decide the optimal lot division. Also, if you don't allow package bids and capacity constraints, then dividing into lots may not result in achieving optimal economies of scale (for bigger firms) or SME support (for smaller firms). Finally, it was often mentioned that the conditional purchasing technique may help to improve expected results of dividing tenders into lots. The buyer and bidders can both be more expressive with the technique.

The answers on the question if it is legally allowed to use the conditional purchasing technique were mixed. The following arguments are given for why the technique is legally allowed: (1) to be legally allowed, a technique has not to be explicitly mentioned, other techniques that are used by public procurers are also not always mentioned in the Directive, (2) the buyer is free to decide on award criteria, and (3) the economically most advantageous tender as considered by the buyer has to win the tender. Arguments against if the conditional purchasing technique is legally allowed are: (1) the principles of equal treatment and non-discrimination are harmed, because conditions exclude certain bidders from winning particular lots, and (2) the conditional purchasing technique isn't mentioned in the Directive, so it isn't allowed.

The public procurement experts all think that the conditional purchasing technique has value for public sector. Furthermore, the research is seen as very timely and relevant. It is suggested that to rise its use in the public sector, successful practical examples of its use in the public sector should be presented in research papers. Another option is that the governments and/or the European Union should publish an advice report about the conditional purchasing technique. Through this, public procurers become more aware of the technique, and their anger to defend the use of the conditional purchasing technique in a court will disappear. The last remark was that formulation and optimization software are important to have. Then, it isn't necessary for public procurers and bidders to have more than basic knowledge of the technique. Finally, all public procurement experts agree: the potential of the conditional purchasing technique in combination with the strategic sourcing optimization software is enormous.

The last part of this chapter is about the strategic sourcing optimization software. Answers of TradeExtensions and Keelvar are combined. Both companies couldn't say anything about the average number of conditions, lots or bidders. This differs a lot per project. Until now, the software of both companies was able to solve all optimization problems. The biggest project of TradeExtensions was for Walmart. There were more than a million bids, thousands of items and many conditions. The software solved this optimization problem in 30 to 40 seconds. Both companies noted that also for smaller projects the software is interesting. The complexity of small projects can still be enormous. This depends on the constraints and how the bids were submitted (package or not). The price for the software is based on the complexity of a project. Therefore, it is difficult to estimate a value from which it is attractive to use the software. The software has to recoup its costs by the extra savings. The savings also differ per project. Both companies faced projects where the savings were only 2-3%, but they also faced projects where the savings were more than 15%. The savings are higher if a company has high fixed costs with decreasing unit costs. The number of bidders and lots also influence this. TradeExtensions and Keelvar offer additions over standard solvers such as Excel. Firstly, the software formulates the optimization problem for the buyer. Secondly, the software is easy to use and allows buyers and bidders to be as expressive as they want. Thirdly, the software optimizes extremely complex strategic sourcing problems in less than a minute. Fourthly, different scenarios can easily be compared by using what-if scenarios. The effects of conditions etc. can easily be observed.

## 6. LEGAL ANALYSIS

An analysis of EU Directive 2014/24/EU is conducted in order to find out if it is allowed for public procurers to use the conditional purchasing technique. Directive 2014/24/EU sets out rules on the use of public contracts for the provision of works, supplies, or services by companies or individuals and the exemptions which can be applied. These rules are only applicable above certain thresholds with a value net of value-added tax (VAT):

-€5.225.000 for public works.

-€135.000 for central government contracts.

-€209.000 for local and regional government contracts.

-€750.000 for social and other specific service contracts.

Although the rules of the Directive aren't updated often, the European Commission assesses the thresholds every two years.

### 6.1 Directive 2014/24/EU about the Division of Contracts Into Lots

Article 46 about the division of contracts into lots states that "Contracting authorities may decide to award a contract in the form of separate lots and may determine the size and subject-matter of such lots," and if a tender isn't divided into lots, "Contracting authorities shall provide an indication of the main reasons for their decision not to subdivide into lots, which shall be included in the procurement documents or the individual report." Thus, buyers are strongly encouraged to divide their contracts into separate lots and they are free to decide on the subject-matter and size of each lot. If a buyer doesn't want to divide into lots, they should good reasons for this choice. Those good reasons have to be included in the procurement documents or the individual report. Because it is strongly encouraged to divide tenders into lots, you can ascertain that the EU thinks it has value for the public sector. Recital (78) gives the reason why buyers are encouraged to divide large contracts into lots: "Public procurement should be adapted to the needs of SMEs. Contracting authorities should be encouraged to make use of the Code of Best Practices... To that end and to enhance

competition, contracting authorities should in particular be encouraged to divide large contracts into lots". Furthermore, Article 46 states that "Contracting authorities shall indicate, in the contract notice or in the invitation to confirm interest, whether tenders may be submitted for one, for several or for all of the lots." Article 46 allows buyers to limit the number of lots for which a bidder is allowed to bid. Recital (78) annotates the following about how to divide tenders into lots: "Division could be done on a quantitative basis, making the size of the individual contracts better correspond to the capacity of SMEs, or on a qualitative basis, in accordance with the different trades and specializations involved, to adapt the content of the individual contracts more closely to the specialised sectors of SMEs or in accordance with different subsequent project phases". This means that the EU acknowledges two ways of supporting the position of SMEs. Buyers can decide themselves if the quantitative or qualitative method fits best with a specific situation. Paragraph 8 and 9 of Article 5 indicate that "Where the aggregate value of the lots is equal to or exceeds the threshold, this Directive shall apply to the awarding of each lot." Thus, it isn't possible to divide tenders into lots to circumvent the rules of the Directive.

## 6.2 Directive 2014/24/EU about Award Criteria

It is also interesting to look at what the Directive says about the award criteria. Although conditions aren't award criteria (such as cost or quality aspects, which are mentioned as possible award criteria in the Directive), conditions can certainly influence the process of awarding lots to suppliers. Recital (89) states that "All winning tenders should finally be chosen in accordance with what the individual contracting authority considers to be the economically most advantageous tender among those offered", and "In order to avoid confusion with the award criterion that is currently known as the 'most economically advantageous tender' in Directives 2004/17/EC and 2004/18/EC, a different terminology should be used to cover that concept, the best price-quality ratio." It is interesting that the Directive states that the economically most advantageous tender should win as considered by the buyer. This is interesting, because a buyer can have many reasons for what they consider as the economically most advantageous tender. For example, minimizing the number of suppliers can result in a higher price in comparison with a situation with many suppliers, but economically more advantageous tender for the buyer. It depends on which award criteria are chosen by the buyer to assess the economically most advantageous tender. Recital (90) tells more about how the economically most advantageous tender should be assessed: "Contracts should be awarded on the basis of objective criteria that ensure compliance with the principles of transparency, non-discrimination and equal treatment, with a view to ensuring an objective comparison of the relative value of the tenders in order to determine, in conditions of effective competition, which tender is the most economically advantageous tender." The principles of non-discrimination and equal treatment could make the use of the conditional purchasing technique more difficult, because conditions always exclude certain bidders from winning particular lots. This is because conditions limit the number of possible award outcomes. It could be that conditions are regarded as discrimination and non-equal treatment of bidders. Importantly, Recital (90) obliges buyers "To enable all tenderers to be reasonably informed of the criteria and arrangements which will be applied in the contract award decision. Contracting authorities should therefore be obliged to indicate the contract award criteria and the relative weighting given to each of those criteria." This means that if buyers want to apply the conditional purchasing technique (if it is allowed at all), this

has to be decided beforehand. All rules and conditions have to be indicated to the bidders. Article 67 is specifically about award criteria, and states that: "Award criteria shall be considered to be linked to the subject-matter of the public contract where they relate to the works, supplies or services to be provided under that contract in any respect and at any stage of their life cycle." It seems that conditions are not allowed if they are not linked to the subject-matter of the contract according to Article 67. However, Article 70 states that "Contracting authorities may lay down special conditions relating to the performance of a contract, provided that they are linked to the subject-matter of the contract ... Those conditions may include economic, innovation-related, environmental, social or employment-related considerations". Those special conditions should also be linked to the subject-matter of the contract, but now the specific considerations behind the conditions are mentioned. Conditions that are linked to the subject-matter of the contract are thus allowed.

It is clear that, in the end, the best price-quality ratio (e.g. the economically most advantageous tender) as considered by the buyer should win the tender. This could make the use of the conditional purchasing potentially possible, because conditions can certainly have value for the buyer, and the economically most advantageous tender that should win is considered from the perspective of the buyer. The non-discrimination and equal treatment principles are possibly not in line with the conditional purchasing technique, because you always exclude bidders from winning particular lots by using conditions. Conditions could be seen as discriminating bidders and non-equal treatment of them. The chosen award criteria of the tender have definitely to be indicated beforehand. Special conditions are mentioned in the Directive, but it isn't clear if the conditions of the conditional purchasing technique are meant with those conditions. Reasons behind conditions could be economic, innovation-related, environmental, social or employment-related considerations. It seems that at least conditions that are linked to the subject-matter of the contract are allowed.

## 6.3 Directive 2014/24/EU about Conditional Purchasing

The term "conditional purchasing" isn't explicitly mentioned in the Directive. However, some recitals and articles discuss features of the conditional purchasing technique. There are two conditions that are explicitly mentioned in the Directive. The first one is mentioned in Article 46: "Contracting authorities may, even where tenders may be submitted for several or all lots, limit the number of lots that may be awarded to one tenderer, provided that the maximum number of lots per tenderer is stated in the contract notice or in the invitation to confirm interest." The second one is mentioned in Recital 79: "Contracting authorities should, for instance in order to preserve competition or to ensure reliability of supply, be allowed to limit the number of lots for which an economic operator may tender". Thus, at least these two conditions are allowed, because they are explicitly mentioned in the Directive. Other conditions aren't discussed in the Directive, and it is unclear if it is allowed to use them. You could argue that other conditions are also allowed, because (1) these two conditions are allowed and are only used as examples. Therefore, other conditions are also allowed. (2) The two explicitly mentioned conditions are also not linked to the subject-matter, and award criteria should normally be linked to the subject-matter of the contract. Therefore other conditions are also allowed. (3) Conditions aren't explicitly forbidden in the Directive, which makes it legally allowed to use conditions. On the other hand, you could argue that other conditions aren't allowed, because (1) other conditions aren't mentioned in the Directive and therefore not allowed. (2) Conditions are often not

linked to the subject-matter of the contract and this is a requirement for award criteria to be allowed.

Recital (59) is a remarkable one. It states that *“There is a strong trend emerging across Union public procurement markets towards the aggregation of demand by public purchasers, with a view to obtaining economies of scale, including lower prices and transaction costs, and to improving and professionalizing procurement management.”* One of the policy objectives of the EU is to support SMEs by encouraging buyers to divide tenders into lots. It is strange to see that Recital (59) talks about economies of scale to achieve lower prices and transaction costs. When tenders are divided into lots, and bidders aren’t allowed to bid on packages of lots, it is difficult for companies to achieve those economies of scale. Allowing package bids is one of the features of the conditional purchasing technique. Also, professionalization of procurement management is mentioned. As will be illustrated by the practical analysis in the next chapter, this isn’t completely true. This can be illustrated by the use of the conditional purchasing technique in the private sector, but its low use in the public sector. However, possibilities for achieving economies of scale aren’t unlimited. Recital (59) annotates that *“the aggregation and centralization of purchases should be carefully monitored in order to avoid excessive concentration of purchasing power and collusion, and to preserve transparency and competition, as well as market access opportunities for SMEs.”*

Another feature of the conditional purchasing technique is the allocation of lots in combination. This is mentioned in the Directive. However, it isn’t linked to the conditional purchasing techniques in the respective article and recital. Article 46 discusses the allocation of lots in combination: *“Where more than one lot may be awarded to the same tenderer, contracting authorities may award contracts combining several or all lots where they have specified in the contract notice or in the invitation to confirm interest that they reserve the possibility of doing so and indicate the lots or groups of lots that may be combined.”* Thus, package bids are allowed, but to be allowed it is necessary to inform bidders about which lots can be combined in the contract notice or in the invitation to confirm interest. Therefore, it isn’t possible to combine lots afterwards to find the most optimal solution for the buyer if not all combinations of lots are specified in the contract notice or in the invitation to confirm interest. Recital (79) adds an extra requirement for using combining lots: *“Contracting authorities should conduct such a comparative assessment by first determining which tenders best fulfil the award criteria laid down for each individual lot and then comparing it with the tenders submitted by a particular tenderer for a specific combination of lots, taken as a whole.”*

In conclusion, you could say that the conditional purchasing technique is at least partly allowed. Buyers are allowed to use the comparative assessment of lots (e.g. package bids) if certain requirements are met and the two conditions that are explicitly mentioned are allowed. It is very important for the buyer to inform the bidders beforehand about the (award) procedure. It is namely not possible to change the (award) procedure after the announcement of the tender. Furthermore, it is doubtful if conditions, which are different from the two aforementioned conditions, are also allowed, because no recital or article writes about it. After reading the Directive, it is reasonable that the writers of the Directive aren’t familiar with the conditional purchasing technique, or don’t even know it at all. The term is namely not explicitly mentioned. Another possibility is that they think the conditional purchasing technique has no value for public procurement. But this seems to be a strange idea, because the value of the technique has been illustrated in the private sector.

## 6.4 The Implementation of Directive 2014/24/EU in Three EU-Countries

Directives have to be translated in country specific laws. In this section, the implementation of Directive 2014/24/EU in the Netherlands, Germany, and Belgium is considered. It is important to note that the analysis is about what the country specific law says about public tenders above the thresholds of the Directive mentioned at the start of chapter 5. The focus in this analysis is on possibilities to apply the conditional purchasing technique.

### 6.4.1 The Netherlands

In the Netherlands, the legislation for public tendering can be found in the “Aanbestedingswet 2012” (Tender Act 2012). Article 2.1 – article 2.6 indicate that chapter 2 of this law applies to public tenders above the indicated thresholds of European Directive 2014/24/EU. The quotes of the articles are freely translated from Dutch into English to make the quotes understandable for all readers, since the Tender Act 2012 isn’t officially translated into English.

Before discussing chapter 2 of this law, it is important to mention one article of chapter 1, namely Article 1.5: *“A buyer has to divide a tender into multiple lots. If this is not deemed appropriate, then the buyer has to motivate this in the tender documents.”* Thus, dividing tenders into lots is strongly encouraged. Article 2.10 states that *“A buyer has to announce in the tender documents if bids can be submitted for one or more lots”* and *“If more lots can be awarded to the same supplier, the buyer can use combinatorial assessment of the lots, if it is mentioned which lots can be combined in the tender documents.”*

Combinatorial assessment (e.g. package bids) is one of the features of the conditional purchasing technique. It is mentioned apart from the term “conditional purchasing”, which isn’t mentioned at all. However, it is thus certainly allowed.

Furthermore, Article 2.10 allows bidders to *“Limit the number of lots that can be awarded to the same supplier if this is mentioned in the tender documents.”* At least this condition is allowed, and another condition is discussed in Article 2.99: *“For the restricted procedure [5], competitive dialogue [3], negotiated procedure [3], and innovation partnership procedure [3], the buyer is allowed to limit the number of bidders if there are a sufficient amount of bidders.”* The number between brackets is the minimum amount of bidders. Article 2.100 indicates that *“When the number of bidders is limited by the buyer, this has to be done in an objective and non-discriminating way and the rules for limiting the number of bidders have to be mentioned in the announcement of the tender.”* Article 2.114 indicates that *“The economically most advantageous tender as considered by the buyer should win the tender.”* This economically most advantageous tender can be based on (1) best price-quality ratio, (2) lowest costs, or (3) lowest price. Article 2.115 is about award criteria. *“The award criteria have to be indicated in the tender documents”* and *“the award criteria should be linked to the subject-matter of the tender.”* Article 2.18 indicates that *“Where the aggregate value of the lots is equal to or exceeds the threshold, this Directive shall apply to the awarding of each lot.”* “The conclusion is simple. The Tender Act 2012 doesn’t differ from the EU Directive 2014/24/EU with regard to the possibility to apply the conditional purchasing technique.

### 6.4.2 Germany

In Germany, the rules for public tenders above the European thresholds can be found in the “Gesetz gegen Wettbewerbsbeschränkungen” (German Act against Restraints of Competition) and “Verordnung über die Vergabe öffentlicher Aufträge” (German Regulation on the Award of Public Contracts). It should be noted that the details of the different

procurement procedures are elaborated in three other procurement regulations, but the specific details aren't important for the analysis about the possibility to apply the conditional purchasing technique. The two acts discussed below are general provisions. There are no official translations of these acts from German into English available. The quotes that are used below are freely translated from German into English to make it understandable for the reader.

Part IV of the German Act against Restraints of Competition is about awarding public contracts. Article 97 states that *"The interests of small and medium-sized undertakings shall primarily be taken into account in an award procedure. Contracts shall be subdivided into partial lots and awarded separately according to the type or area of specialization. Several partial or trade-specific lots may be awarded collectively if this is required for economic or technical reasons."* This article supports the package bidding feature of the conditional purchasing technique. This feature is allowed if the buyer has economic or technical reasons for it. Most of the time, the reason behind using package bidding is an economic reason. Furthermore, article 97 annotates that *"The tender which is the most economically advantageous shall be accepted."* This is in line with the EU directive on public procurement. There are no specific conditions or other features of the conditional purchasing technique mentioned in the German Act against Restraints of Competition.

The articles that are discussed from now on are from the German Regulation on the Award of Public Contracts. Article 3 about the estimation of the value of the tender states that *"If tenders are divided into lots, the combined value of all lots have to be used to check if the rules for tenders above the thresholds have to be used for each lot"*. Article 8 requires buyers *"To communicate the award procedure beforehand to bidders."* Article 30 obliges buyers *"To communicate beforehand if a bidder can bid for one, more, or all lots"* and allows buyers *"To limit the number of lots that can be awarded to a bidder."* Thus, at least the condition: bidder X can be awarded X lots at most is allowed. Also, article 30 allows buyers *"To allocate lots in combination if it is communicated to the bidders which lots can be combined."* This supports the package bidding feature of the conditional purchasing technique. Article 51 allows bidders *"To limit the number of bidders for the restricted procedure [5], negotiated procedure [3], competitive dialogue [3], and innovation-partnership procedure [3] if there are more than the minimum amount of bidders (between brackets) and this the objective and non-discriminating rules for limiting the number of bidders are announced in the tender documents."* Thus, for these procedures buyers are allowed to limit the number of bidders if there are more bidders than the minimum amount. Article 58 confirms the German Act against Restraints of Competition and states that *"The economically most advantageous tender shall win."* This economically most advantageous tender is assessed on the best price-quality ratio. In addition to price or costs, *"qualitative, environmental and social criteria can be used."* In conclusion, you can say that the German regulation doesn't differ from the European Directive with regard to the possibility to apply the conditional purchasing technique.

### 6.4.3 Belgium

In Belgium, the rules for public tenders can be found in the "Wet Inzake Overheidsopdrachten, 17 juni 2016" (Public Tender Act, 17<sup>th</sup> of June, 2016). All chapters of title 2 of the law apply to public tenders above the European thresholds. The articles that will be discussed are from title 2 of the act. The Public Tender Act isn't officially translated into English. Therefore, the quotes that are used below are freely translated from Dutch into English. Article 58 states that *"Buyers can decide to divide tenders into lots. If tenders are divided into lots, the nature, size, subject-*

*matter, division, and characteristics have to be announced in the tender documents."* Furthermore, article 58 annotates that *"If buyers don't divide into lots, the reasons for this choice have to be mentioned in the tender documents."* This means that also in Belgium, buyers are strongly encouraged to divide tenders into lots. Article 58 also allows buyers *"To allocate only part of the lots if a tender is divided into lots."* Lots that aren't allocated can be added to new tenders. It is possible to do this via a different procedure. This is confirmed by Article 85: *"Following a procedure doesn't oblige the buyer to award the tender, the buyer can cancel the allocation or allocate via the same or a different procedure."* Article 58 obliges buyers *"To mention if bidders can bid for one, more, or all lots."* According to Article 58, buyers *"Can limit the number of lots that can be awarded to one bidder if this is announced in the tender documents."* Thus, at least this condition is allowed. Article 79 states that *"For the restricted procedure [5], competitive dialogue [3], innovation partnership [3], and negotiated procedure [3], the buyer can limit the number of invited bidders if this number exceeds the minimum number of bidders (between brackets)."* Also, if there is a maximum number of bidders, this has to be mentioned in the tender documents. For the open procedure it isn't allowed to limit the number of bidders. Article 81 states that *"The buyer should base the allocation of public tenders on the economically most advantageous tender as considered by the buyer."* The economically most advantageous tender can be based on (1)price, (2)costs, or (3)best price-quality ratio should. Furthermore, article 81 states that *"Award criteria should be linked to the subject-matter of the tender"*. In summary, the rules with regard to the conditional purchasing technique in Belgium don't differ from rules of the European Directive.

## 7. DISCUSSION AND CONCLUSION

The aim of this research paper was to find an answer on the question "Why and how should public procurers in Europe use the conditional purchasing technique?" Several sub-research questions were formulated to find a comprehensive answer on this main research question. The results of the critical analysis of the existing literature, seven interviews with public procurement experts, and public tender analysis are used to explain why and how public procurers in Europe should use the conditional purchasing technique.

From the public tender analysis and interviews with public procurement experts, it can be concluded that features of the conditional purchasing technique are used only very occasionally. But, why should public procurers in Europe actually use the conditional purchasing technique? The existing literature is analyzed and public procurement experts are interviewed to find an answer on this question. The following advantages of the conditional purchasing technique are identified: 1) buyers can achieve policy objectives more easily, 2) SMEs are able to compete more easily with larger companies, 3) the buyer as well as the bidders can be more expressive, 4) lower costs due to cost synergies, 5) increased creativity and innovation by suppliers, 6) buyers can easily experiment with trade-offs between conditions by using what-if scenarios, 7) decreased transaction costs for complex procurement negotiations in comparison with alternative techniques that can be used, and 8) it prevents bidders from facing the exposure problem. Furthermore, public procurement experts are asked about their personal opinion about the conditional purchasing technique. The answers were unanimous: the conditional purchasing technique could have value for the public sector. According to them, the potential of the technique in combination with the strategic sourcing optimization software is enormous. Several problems why public procurers aren't using the conditional purchasing technique are identified from the

interviews with public procurement experts. A solution is developed to solve those problems. Firstly, public procurers don't care enough of the money they spend. They only get punished when something goes wrong. They lack the incentives to improve their procurement strategy again and again. Secondly, Public procurers may lack the knowledge to use new complex procurement techniques. Thirdly, the award procedure has to be announced beforehand. The workload before the tender is awarded increased. This seems to be too high in comparison to what is seen as normal now. Fourthly, lawyers who create the Directives on public procurement and country-specific regulation don't have the knowledge of economics and mathematicians. They have a different style of thinking. Because the term "conditional purchasing" isn't mentioned in the Directive, it is unclear if it is actually allowed. It is suggested that to rise the use of the conditional purchasing technique in the public sector, successful practical examples of its use in the public sector should be presented in research papers. Furthermore, the governments and/or the European Union should publish an positive advice report about the conditional purchasing technique and they should educate/incentivize public procurers about new procurement techniques. Through this, public procurers become more aware of the technique and the need to improve the procurement strategy. Their anger to defend the use of the conditional purchasing technique in a court will probably also disappear. In the Directive 2014/24/EU it is stated that the European Union wants to professionalize the procurement function. Then, public procurers should definitely follow trends and not stick to their old procurement strategy. Probably as important as why public procurers should use the technique, is how should public procurers use the conditional purchasing technique? It is an advanced procurement technique. Therefore, public procurers have to consider potential pitfalls before they are going to use the technique. The first big potential pitfall is the use of sub-optimal allocation techniques for the potential complex computational problem in determining the winners of the lots. Five of such techniques are identified: (1) the sequential approach, (2) the biggest bid difference approach, (3) the lowest bid approach, (4) limiting the number of lots for which a bidder can bid beforehand, and (5) allocating the highest volume lot first. In chapter 3, some of these techniques are illustrated. Even in a small example, these allocation techniques lead to a sub-optimal outcome. Therefore, public procurers should be trained to work with the technique, and they should learn how to arrive at the optimal outcome. IP/LP software are available to help public procurers. For extremely complex optimization problems, software from companies as TradeExtensions and Keelvar has to be acquired. Secondly, the technique is strategically very complicated. For example, when bidders place bids on separate lots and on combinations of lots (e.g. package bids). Package bids compete with bids on single lots factually. Bidders may inflate their bids on single lots, or not even place a bid to increase the chance of winning a combination of lots. Buyers have to understand the technique completely to gain the benefits that the technique has over other techniques that can be used for the allocation of lots to suppliers. Thirdly, legal experts doubt about if the technique is fully legally allowed. Although the assessment of lots in combination and two specific conditions are discussed, it isn't clear if other conditions are also allowed. You could argue that the conditional purchasing technique is fully legally allowed, because (1) a technique has not to be explicitly mentioned to be allowed for public procurers, other procurement techniques that are currently used by public procurers are also allowed, (2) two conditions are allowed, so why should the other conditions not be allowed?, (3) the buyer is free to decide on award criteria, and should consider themselves as what is the economically most advantageous tender for them,

and (4) it is believed that if you describe the award procedure clearly beforehand, then public procurers are allowed to use the conditional purchasing technique.

In summary, public procurers in Europe should use the technique more often, because it has clear advantages over some techniques that are currently used. Also, as confirmed by public procurement experts: the technique has huge potential. However, it should be noted that every situation is unique. This means that public procurers should not always use the conditional purchasing technique. It depends on the market characteristics and product/service characteristics if the conditional purchasing technique fits with the situation. Furthermore, public procurers in Europe have to carefully consider the potential pitfalls, and they should be well prepared for these pitfalls if they are willing to use the conditional purchasing technique.

## **8. IMPLICATIONS AND LIMITATIONS**

### **8.1 Managerial Implications**

This research explored why public procurers in Europe should use the conditional purchasing technique more often. Since it is strongly encouraged by the EU in the Directive on public procurement to divide tenders into lots, it is important which techniques they use to award lots to bidders. As can be concluded from the interviews with public procurement experts and the public tender analysis, public procurers don't often change their procurement strategy. This is probably because they aren't very sharply restricted to their budgets and they are only punished if something goes wrong. This attitude towards new procurement techniques has to change. Figure 1 of the introduction (chapter 1) shows the importance of public procurement for a country. Therefore, new procurement techniques have to be considered. Existing literature and public procurement experts acknowledge the potential of the conditional purchasing technique in combination with software that can solve the extremely complex mathematical problems that arise from the conditional purchasing technique. However, one difficulty is that the law doesn't provide a clear answer on the question if the conditional purchasing technique is legally allowed. If this problem can be solved, then the potential of the conditional purchasing technique may finally be utilized.

### **8.2 Contribution to Theory**

In the academic research, little can be found about the use of the conditional purchasing technique in the public sector. This paper analyzed public tenders from the Netherlands, Germany and Belgium to find out if the conditional purchasing technique is used in the public sector. To gather information about other countries, interviews with public procurement experts are held. Based on this information, it can be concluded that the features of the conditional purchasing technique are used very occasionally. Furthermore, the term "conditional purchasing" isn't commonly accepted terminology. This research paper identified different terms that are used for (features of) the conditional purchasing technique. This research paper combines the results of research papers that are written about (features of) the conditional purchasing technique. The results of the extensive literature are structured in a clear way. Finally, it is unclear if public procurers are actually allowed to use the conditional purchasing technique. Therefore, opinions of public procurement experts from various countries are gathered about this issue, and an analysis of the Directive 2014/24/EU on public procurement and its implementation in the Netherlands, Germany, and Belgium is conducted.

### 8.3 Limitations

Every research has its limitations and the most significant barrier for this research paper was the short time in which the research paper has to be completed. As a consequence of that, it wasn't possible to analyze public tenders of more countries and to have interviews with public procurement experts from more countries. Also, if the time frame was longer, interviews with more than one public procurement expert per country would have been possible more often. The generalizability of the findings about the use of the conditional purchasing technique in the public sector is harmed, because public tenders from only three countries in the European Union are analyzed. Furthermore, it is not possible to say anything about the possible use of the conditional purchasing technique in countries outside the European Union. Another limitation is that no public sector company that uses the conditional purchasing technique is identified. Therefore, private sector companies were contacted, but they didn't have time to have an interview. If a company that uses the conditional purchasing techniques (frequently) could be identified, an interview could have been held. It would be great to talk to people who used to work with the conditional purchasing technique. Due to the time frame and the focus of this research paper, it was also not possible to have contact with experts of the Directive 2014/24/EU who could provide me a definite answer, or at least more clarity, on the question which parts of the conditional purchasing technique public procurers are allowed to use.

### 8.4 Future Research Opportunities

There are several research opportunities with regard to the conditional purchasing technique and its use. Firstly, it would be interesting to see if the technique is used more frequently in the public sector outside the European Union, or in other countries in the European Union. Tenders of other countries have to be analyzed to provide an answer on that question. Secondly, it is known that the technique is used in the private sector, but it would be interesting if a paper is written in the future about its use in the public sector with practical experiences from public procurers. Thirdly, since the conditional purchasing technique has only recently been (partly) introduced in Directive 2014/24/EU, it would be interesting to see what the effect of this is in a couple of years. It is namely possible that public procurers are using the technique more often in a couple of years. An analysis which compares tenders of at least 7 or 8 countries from all over the world would be a great idea for a research paper in the future. Fourthly, a paper which compares and combines the experiences and way of thinking of public procurers from all over the world. In my paper the thoughts about public procurers are based on experiences of public procurement experts. However, it would be interesting to see what public procurers experience themselves. Then, you can be sure about how public procurers think about the conditional purchasing technique.

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## 11. APPENDIX

### 11.1 Appendix A – Summarizing Pie-Charts and Overviews of the Netherlands

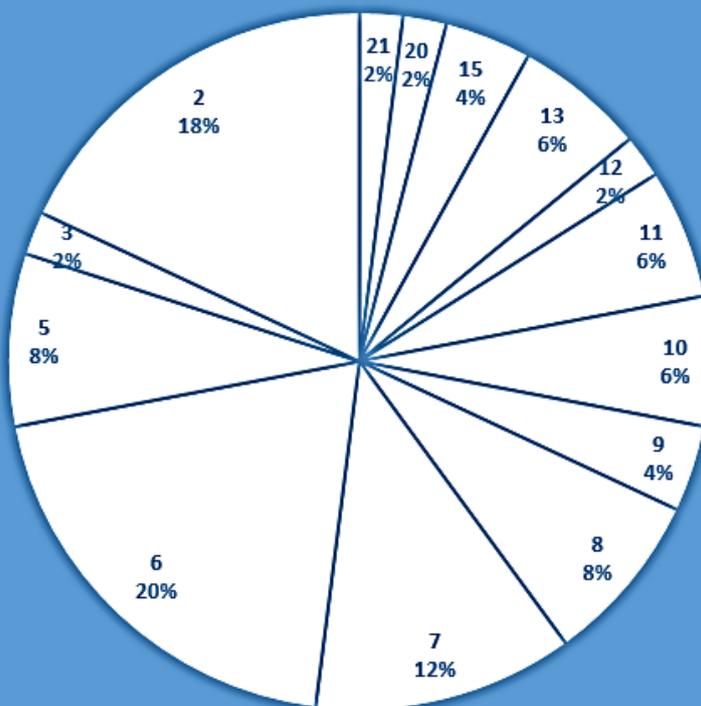
#### TenderNed-ID overview – The Netherlands

105926 – 109119 – 97730 – 87157 – 86461 – 110381 – 115761 – 109181 – 101395 – 128529 – 135180 – 117388 – 112686 – 133273 – 101764 – 117955 – 90620 – 135224 – 135634 – 107335 – 83463 – 103181 – 117761 – 110644 – 104452 – 114243 – 111104 – 89606 – 98741 – 141334 – 104981 – 128417 – 137544 – 124140 – 117619 – 123118 – 90509 – 131580 – 113385 – 102379 – 133623 – 116156 – 136285 – 122741 – 117978 – 111292 – 85890 – 81237 – 124669 - 31412

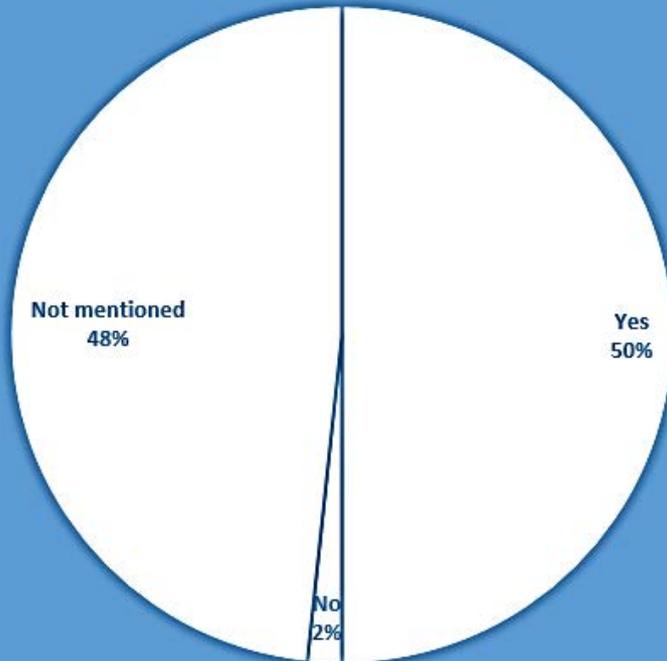
#### Special conditions overview – The Netherlands

- A bidder can be awarded at most X lots.
- A bidder can be awarded at most X lots, and the bidder is free to choose on which lots to bid.
- A bidder can be awarded lots from at most X different regions.
- A bidder has to bid on all lots.
- A buyer is allowed to use comparative assessment in the allocation of lots to suppliers.

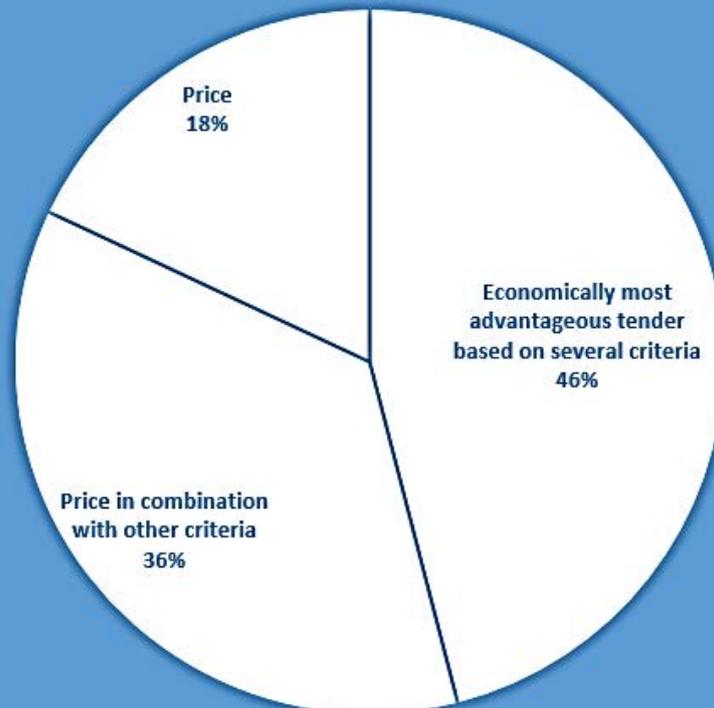
#### NUMBER OF LOTS - THE NETHERLANDS



## ARE BIDDERS ALLOWED TO BID ON ALL LOTS? - THE NETHERLANDS



## AWARD CRITERIA - THE NETHERLANDS



## 11.2 Appendix B – Summarizing Pie-Charts and Overviews – Germany

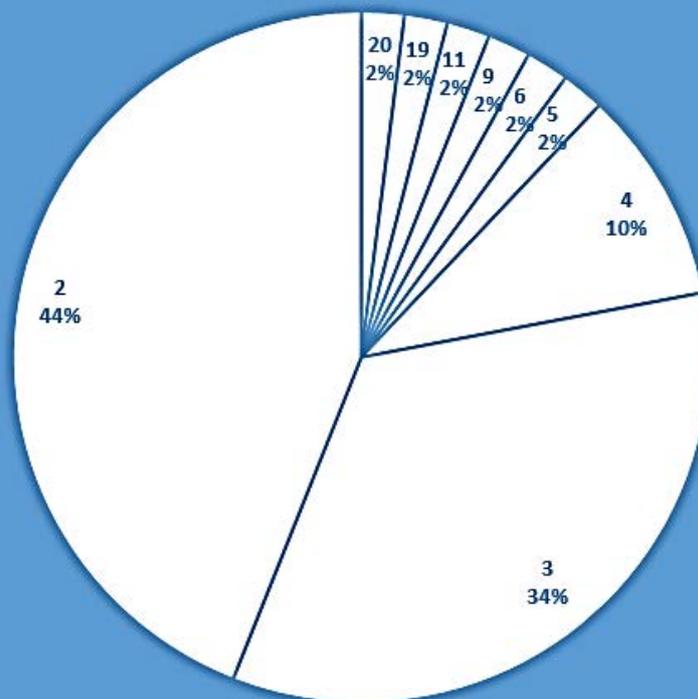
### Tenders Electronic Daily (TED)-ID overview – Germany

35936-2016 – 97009-2016 – 19-2016 – 100825-2017 – 103028-2017 – 107193-2017 – 111720-2016 – 127663-2017 – 138255-2016 – 179402-2017 – 185925-2017 – 249736-2016 – 258100-2016 – 315610-2016 – 319051-2016 – 350794-2015 – 354136-2015 – 362354-2016 – 378671-2015 – 407261-2015 – 429615-2015 – 456382-2015 – 2-2015 – 1296-2015 – 31516-2015 – 65714-2015 – 94075-2014 – 96665-2013 – 140440-2015 – 148819-2013 – 155797-2013 – 199000-2015 – 201811-2014 – 231311-2015 – 265070-2015 – 294141-2013 – 297197-2014 – 330934-2014 – 418284-2013 – 422074-2013 – 72894-2013 – 87810-2013 – 189346-2012 – 218165-2012 – 223971-2012 – 289283-2012 – 297674-2012 – 340986-2012 – 394614-2012 – 198619-2016

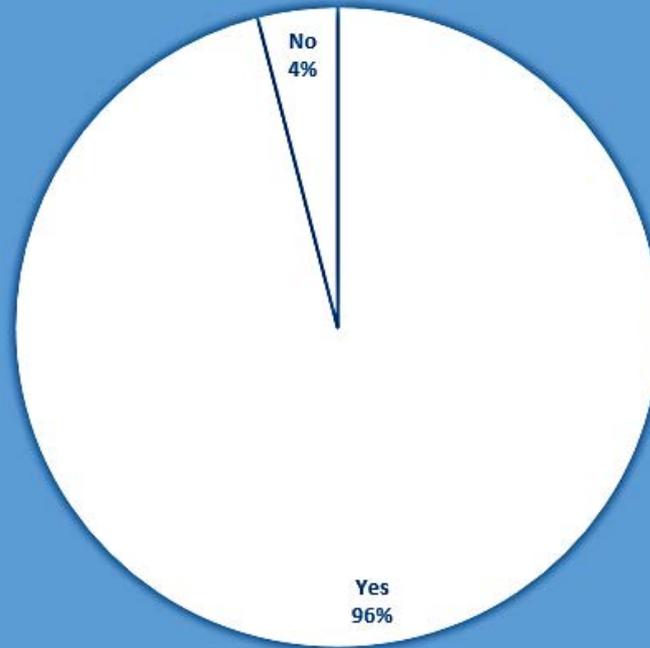
### Special conditions overview – Germany

- The framework agreement can have at most X participants.
- A bidder can be awarded at most X lots.
- Making use of the procedure whereby the number of bidders is reduced in different phases.
- The buyer is allowed to use comparative assessment in the allocation of lots to suppliers.
- At most X bidders will be invited.

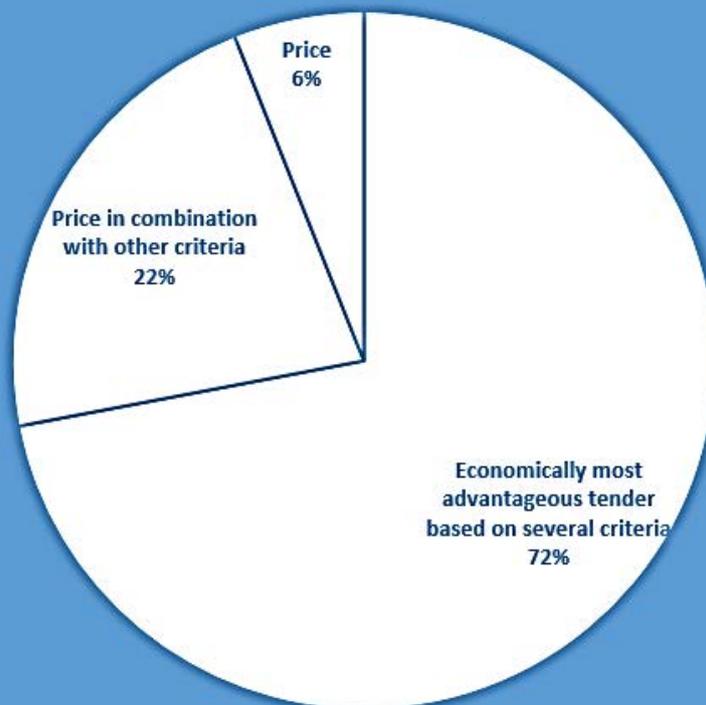
### NUMBER OF LOTS - GERMANY



## ARE BIDDERS ALLOWED TO BID ON ALL LOTS? - GERMANY



## AWARD CRITERIA - GERMANY



### 11.3 Appendix C – Summarizing Pie-Charts and overviews – Belgium

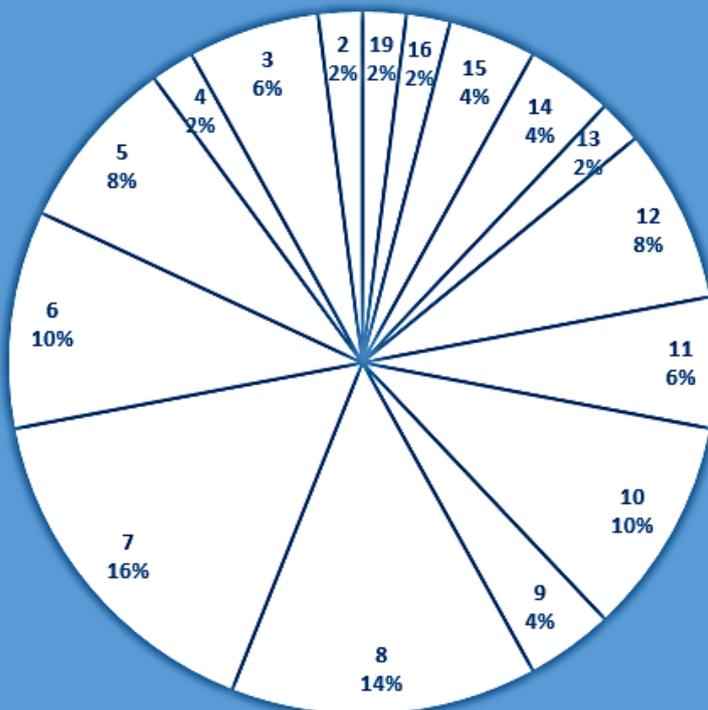
#### Tenders Electronic Daily (TED)-ID overview – Belgium

204183-2015 – 264489-2015 – 259124-2016 – 364467-2016 – 144042-2017 – 327595-2016 – 206596-2017 – 142857-2015 – 247909-2015 – 356341-2015 – 328126-2015 – 246318-2016 – 360394-2015 – 161958-2017 – 203322-2017 – 195072-2015 – 197215-2015 – 206501-2015 – 57026-2017 – 233060-2015 – 322647-2015 – 197304-2017 – 200636-2015 – 246631-2015 – 203296-2017 – 403109-2015 – 228439-2016 – 379293-2016 – 173500-2017 – 117242-2017 – 289872-2015 – 182852-2016 – 29396-2016 – 323748-2016 – 382604-2016 – 422178-2016 – 50921-2017 – 110937-2017 – 248715-2016 – 159589-2017 – 350267-2016 – 364172-2016 – 425650-2016 – 113078-2017 – 127542-2017 – 30373-2017 – 371993-2016 – 171193-2017 – 75858-2017 – 115235-2017

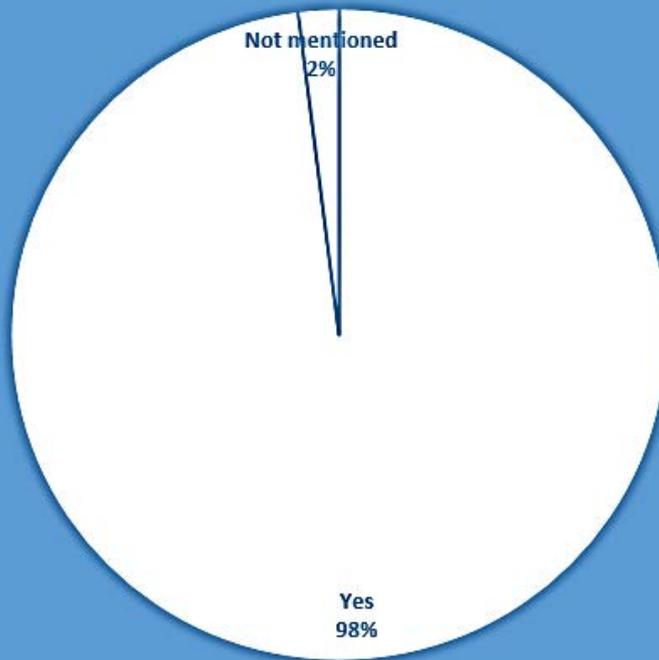
#### Special conditions overview – Belgium

- The framework agreement can have at most X participants.
- Making use of the procedure whereby the number of bidders is reduced in different phases.
- At least X bidders are invited.
- At most X bidders are invited.
- A bidder can be awarded at most X lots.
- The buyer isn't obliged to allocate all lots.

#### NUMBER OF LOTS - BELGIUM



## ARE BIDDERS ALLOWED TO BID ON ALL LOTS? - BELGIUM



## AWARD CRITERIA - BELGIUM

