MSc Thesis

Abnormally Low Tenders: Objectifying Detection

Working towards economically sustainable procurement through a framework for the contracting authority to objectify the detection of abnormally low bids

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Preface

People both on individual and a collective level are trying to achieve a balance between price and quality of what they obtain and of what they produce. Based on the perception of what is the rate of price-quality decisions are made regarding which product to buy, but also which one to produce. Interestingly, there is one common aim and this is to optimize the level of quality for a minimum price. However, there are boundaries within which the set of price-quality can be realistic and those boundaries are not always discrete. Identifying whether a set of price-quality is realistic depends highly on the knowledge one has on the type of product he evaluates. For instance, it took me 2 years of living in Delft before I could understand if a low price asked for an old, Dutch bike is worthwhile or problems would emerge the next day and the repair costs would prove the deal not to be beneficial.

This report intends to provide knowledge and information about the problem of examining whether the set of price-quality offered in tenders is realistic, in the context of infrastructure projects in the Netherlands. The study was conducted for my master thesis at TU Delft, which constitutes the last step in completing the Construction Management and Engineering MSc program. It has been a challenging period during which I obtained significant knowledge on the legal framework of public procurement on a European level and on the demanding process of estimating the project costs, especially in the Dutch context.

Succeeding in the final part of my studies would not be possible without my graduation committee, namely Monika Chao-Duivis, Leon Hombergen and Louk Heijnders, whom I would like to thank for providing me with guidance and feedback in the most cooperative way. The research was performed in the form of an internship at Royal HaskoningDHV, which I would like to thank for making this research possible and for introducing me to the world of procurement of large infrastructure projects. Most importantly, I need to thank my supervisor in RHDHV, Jan-Reinout Deketh, for giving me this life-changing opportunity. In addition, I would like to thank Johan Hekker for his trust and for facilitating my presence in the Business Line Infrastructure and the beautiful, creative and respectful working environment in Amersfoort.

I cannot omit thanking Gerard Filé in RHDHV for his help and for bringing me into touch with an extensive network of cost engineers in the Netherlands. Focal point of this research are the two rounds of interviews conducted in person with legal and cost experts in their offices. I need to express my gratitude to each one of those professionals for their valuable input, their interest and their willingness to assist me. Last but not least, I would like to thank my family for their mental, moral and material support. Also, my friend and classmate Pablo Labarca Perez for being a source of inspiration and my girlfriend Anna for her support and understanding.

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Executive Summary

Problem Analysis
The starting point for this research has been the growing awareness of the European construction industry that the downward pressure on prices should not impair the quality of products delivered. In the field of infrastructure public clients strive to deliver value to society, while they need to cope with budget restrictions that are intensified by the economic downturn. In that respect, the challenge for contracting agencies is to organize procurement processes in a way that contracts are awarded to competitive tenders, without adverse effects on the contract realization.

In particular, because of the downward pressure on prices clients are receiving with increasing frequency bids that are substantially lower than estimated or than the other bids. The European legislation refers to this phenomenon by the term “abnormally low tenders” (ALTs). Although the concept is regulated, there is no commonly acceptable definition of what constitutes an abnormally low tender in reality. The situation becomes more complex if we consider that both the contracting authorities and the bidders aim for low tenders. Contractors aim to win the contract to ensure they have work for their skilled staff and to protect their cash flow, and thus may even decide to tender at a loss. For contracting agencies that strive to achieve resource efficiency and to see their projects approved by central government, receiving very low tenders may be welcome at one level. However, if a tender proves to be economically unviable the client will be confronted with cost escalation and a performance that has adverse effect on the project materialization. The contractor that is faced with financial loss, in an effort to save costs, claims for extra charges and limits expenditure on health and safety. These effects are passed on through the supply chain to subcontractors that are squeezed, suppliers and employees. In addition, the contract scope is reduced where possible to cut expenditures and contractors intend to charge the client for extra work outside the scope of the contract. The problems in the contract execution create friction between the contractual parties which often leads to timely disputes between the client and the contractor. The result is a project that contradicts the principles of sustainable procurement that aims for resource efficiency, improving quality of products and services and ultimately optimizing costs.

Research Process
The issue of ALTs has two main parts, the detection of ALTs and the decision on whether to reject or not. There are proactive measures that can be taken to discourage the submission of ALTs and retroactive measures to safeguard the project materialization. However, the focal point of the problem, on which the research focuses, remains the identification of ALTs. The objective of this research is to “contribute to the direction of achieving economically sustainable procurement by elaborating on the identification of ALTs”. In particular, the objective is to examine the potential of setting standards for the identification of ALTs and to formulate suggestions on how to improve the outcome of tendering processes. In relation to this objective, the research question that is posed is “in what ways can the contracting authorities objectify the detection of ALTs?”.

Based on the preliminary research, it was decided to study the implications of the legal framework, the forms of collaboration, the cost estimation and the award mechanisms on the identification of ALTs. The boundaries of the research involve integrated contracts, which are dominant in large transportation infrastructure projects in the Netherlands, procured with the EMAT mechanism, the application of which is required by the new Dutch Procurement Act. Those key concepts and the relation between them are studied in theoretical terms through an extensive literature study.
Because the concept of ALTs is ill-defined in the EU Directives, relevant case law was reviewed to obtain an insight on the characteristics of such tenders. Furthermore, the proposal for a new Directive was studied, which involves a revision of the article on ALTs. An overview of the national legislation of the 27 EU Members was created, as several countries have legally established standards for the detection of ALTs. The intermediate findings up to that point constituted an input for the main part of the research: two rounds of interviews with cost and legal experts on the field. To get a comprehensive view of the issue, experts from the clients’ and the contractors’ side were contacted.

**Legal Framework**

In legal terms, ALTs should be related with objective concepts as the economic sustainability of bids and not the seriousness or genuineness of bids that has the potential to be subjective. From a client’s perspective that is of interest for the research, the economic sustainability of tenders concerns whether there is a reasonable risk of non-performance of the contract or of financial instability or disequilibrium. Thus, abnormally low might be regarded any tender priced at a level which leads the client to conclude that the project cannot be delivered in accordance with the contract, in the manner promised by the bid and for the whole duration of the contract.

In the national legislation of the European countries three approaches can be encountered for the identification of ALTs: relative standards, absolute standards, and use of both depending on the number of received bids. Relative standards examine the deviation of a tender for the mean of the tenders, while absolute standards examine the deviation from the client’s cost estimation. Legally establishing the cost estimate as a standard is complex, because the client would have to be able to substantiate their estimate and argue on it. The competitive advantage of relative standards is that they reflect market conditions. However, relative systems create space for manipulation of the tender process and require a minimum number of bids for the mean to be trustworthy.

Based on the current legal framework there is no duty for clients to investigate for ALTs, but only a right. The only duty that exists for the client is to investigate a tender before rejection, by asking the bidder for explanation in written, on precise point of the bid that raised suspicions. Consequently, the aforementioned standards can only be used to identify tenders for which further investigation is needed. If the explanation provided in due time is unsatisfactory, the client has the right to decide on whether to reject the tender or not. Thus, there are no juridical consequences stemming from the use of standards for the detection of ALTs. However, the client is liable for the argumentation on the decision about whether to reject a tender or not based on the explanation received by the bidder. Lastly, if this explanation is unsatisfactory the contractor is not allowed to make alteration in the bid in such an extent to overcome the bid being considered abnormally low.

**Implications of integrated contracts and the EMAT mechanism**

From a theoretical perspective the collaboration between clients and bidders is a principal-agent relationship, characterized by misalignment of objectives and asymmetry of information between the two parties. In practice, integrated contracts enhance the information asymmetry during tendering. Specifically, the introduction of integrated contracts had negative implications for the accuracy of the cost estimation, which is a complex task performed differently by clients and bidders. In the lack of a detailed design the cost estimation needs to be done on a higher level of the WBS where the uncertainty is high. In addition, the scope for which the client and the contractor calculate cost differs, which is reflected in cost estimates that deviate, enhancing the complexity of evaluating bids.
The differences in the scope determined by the client and the bidder(s) stem from the design freedom that functional specifications aim to provide. Describing the client’s requirements functionally creates ground for misinterpretations of the specifications, which can lead to the submission of ALTs either deliberately or even accidentally. Integrated contracts are typically procured with the EMAT mechanism. In practice, the EMAT still leaves space to submit ALTs and also makes their detection complex, because combining quality criteria with price is very difficult. Overall, the use of integrated contracts has proven to be adding difficulty in the detection of ALTs.

**Improving Procurement Processes**

The detection of ALTs is a complex problem that requires much more than setting mathematical standards in order to be solved. The steps that need to be taken by contracting authorities to deal with ALTs are equally important to the standards that may be used to identify such tenders. Improving the accuracy of the cost estimation is important and requires an extensive cost reference database. A very demanding step that needs to be made is to work towards standardizing the cost breakdown, by establishing a common definition of the cost elements and what they involve. The SSK constitutes a model that can be used as a baseline for a widely accepted approach on the cost breakdown. This would strengthen the client’s understanding of how prices offered in the bids were built up. On a project basis, this can be achieved by asking for price specifications in the tenders.

Further from the cost estimation, the way in which the EMAT mechanism is applied needs to be improved especially with respect to the quantification of qualitative aspects of tenders. Clients should disengage from attributing similar scores to the bidders’ performance on quality criteria, which makes it hard to distinguish if the quality offered is abnormal in relation to the price charged. Organizing procurement processes is a complex task and being efficient is largely a matter of experience and knowledge. Thus, clients should analyze the outcome of previous tenders to determine the characteristics of the market(s) in which they operate. Having an insight on the efficiency and sensitivity of the market assists in understanding if deviations in the bids should be expected and up to what point they can be attributed to market conditions.

**Setting Standards**

Regarding the standards that can be used to determine tenders that require further investigation, there are three levels in which action can be taken: the national law, the clients' tendering guidelines and the tender documents. Establishing unified mathematical standards in the national law is extremely difficult as those would have to be applicable for various markets, types of projects and contractual forms. On the other end, acting solely on the level of the tender documents does not guarantee the uniformity of the process. In contrary, clients can describe the process to be followed in the tendering guidelines, to achieve uniformity in decision making, enhance the transparency of the process and preserve competition. Provided that research is conducted on the types of standards and the corresponding thresholds, mathematical standards can be set in the tender documents.

In their tendering guidelines clients should set a non-exhaustive list of factors to be examined for the identification of tenders for which explanation shall be asked, only in qualitative terms. Those factors include the deviation from the cost estimation, the deviation from the mean of the bids and the risk analysis. It should be added that the specific factors to be examined together with the thresholds will be described in the tender documents, taking into account the project context. In order to avoid false statements by the contractor, it should be clarified that if the explanation on the tender is accepted, it will be legally binding for the contract execution.
Even though the exact quantitative standards to be set in the tender documents need to be context specific, some general characteristics of a potential framework can be determined. Initially, both absolute and relative standards should be used depending on the number of bids. The cost estimate should be used as an indicator when few tenders are received, provided that the client has the expertise to prepare a trustful estimate. Above a certain number of bids, the mean of all the valid bids should be used as an indicator. Ideally, if an even greater number of bids are received the highest and the lowest should be omitted from the calculation of the mean, so as to avoid outliers’ effects.

Up to a certain deviation, either from the mean of the bids or from the cost estimation, there is ambiguity on whether tenders should be examined. However, above that point it is undoubtful that tenders need to be investigated. Thus, gradual standards can be established meaning that up to a certain deviation the investigation should be optional and only above that point it should be mandatory. In the former case, the client should take into account the risk analysis in deciding whether to investigate the tender. The aforementioned characteristics are imprinted in a framework created based on the consultation of legal and cost experts throughout the interviews. It needs to be made explicitly clear that this constitutes an exemplar of a framework for the detection of ALTs. The only purpose that this exemplar serves is to indicate the main features of a potential framework to be set in the tender documents and possibly to act as a guideline for further research.

<table>
<thead>
<tr>
<th>Deviation of Tender</th>
<th>Action</th>
<th>Number of bids</th>
<th>Suggested Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 - 35 %</td>
<td>Optional Investigation</td>
<td>&lt; 5</td>
<td>Cost estimation</td>
</tr>
<tr>
<td>&gt; 35 %</td>
<td>Obligatory Investigation</td>
<td>5 - 7</td>
<td>Mean of all bids</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≥ 7</td>
<td>Mean of the bids excluding the highest and lowest</td>
</tr>
</tbody>
</table>

The identification of ALTs is considered by the vast majority of the interviewed as a step towards economically sustainable procurement. Developing a framework for the identification of such tenders is a very demanding process, but has the potential to prove beneficial for the contractual parties. Bidders will be motivated to submit tenders that do not involve unreasonably high risks for the project materialization. Contracting authorities will be incentivized to build on their knowledge and expertise in the field of procurement. Most importantly, contractual parties will be encouraged to work and improve together as professional counterparts for the benefit of the society, through the delivery of successful and resource-efficient infrastructure projects.
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1. Introduction

1.1. Research Background
The construction industry and especially the field of large infrastructure projects have unique characteristics that influence the relationship between the client and the producer. Infrastructure projects imply the development of complex, one-off products that contradict the standardization of the processes involved in all project stages, from conceptualization till operation. Public infrastructure adds value to societal life, pulls high levels of resources from the economy, attracts public attention and involves multiple stakeholders with diverse interests. Moreover, the long project lifecycle comes together with changes in the project dimensions and/or the business environment, which bring turbulence in the relation between the client and the contractor (Giannikis, 2011, p. 4).

Most importantly, the construction industry is traditionally one where those who produce (the contractors) are not the ones who come up with the initial idea for a project (the clients). Therefore, the client depends on the contractor to come up with innovative solutions which can add value to the project and increase the benefits for all the involved parties. In order to take advantage of the contractor’s expertise and maximize the project’s value, clients are using integrated contract forms in which the contractor is also responsible for the design. As a result, the level of information available to the client and his capacity to manage the crucial procurement phase diminish.

The situation become more complex if we consider that there is a divergence between the client’s and contractor’s interests. The client tends towards competitive tendering to maximize value for money which means realizing the required functionality at the lowest capital cost. The contractor tends towards negotiation and longer term contracts to maximize his returns from executing the work, through the exploitation of the competencies that the owner does not possess in-house (Apostol, 2011). This contractual combination of conflicting objectives and asymmetric information between the parties is in essence a principal-agent problem (Soudry, 2006).

In a principal-agent relationship the price of developing a product divides the total benefit into added value for the client and profit for the contractor (Figure 1). Despite the different interests, there is one common goal: to enlarge the difference between value and costs in such a manner that the resulting price is beneficial for both (Giannikis, 2011, p. 3). However, there is a limit in the value that can be delivered for a certain cost, above which there are adverse effects for the project materialization. In that respect, both clients and contractors should commit themselves during tendering to enter into a contractual agreement that facilitates a smooth project realisation. From the client’s perspective, this depends also on the capacity to evaluate the received tenders.

![Figure 1: Basic transaction model: Value - Price - Costs (Giannikis, 2011)](image-url)
1.2. Problem Analysis

More than a decade before, in 2001, a fraud in the Dutch construction industry was revealed. Specifically, contractors were fixing the prices to be submitted during tendering on a higher level. The revision of the EU Directives on public procurement in 2004, that stimulated the obligation for transparency, seems to have put an end to such practices. Lately, clients are noticing with increasing frequency that the prices tendered by some bidders are substantially lower than estimated and/or than the other bidders. The EU Directives refer to this phenomenon in the homonymous article about “abnormally low tenders”.

Contractors may win the tender by submitting an abnormally low tender (ALT) either accidentally, because of a miscalculation of the bid price, or deliberately in an effort to stay in the business (Gunduz & Karacan, 2009, p. 130). In the latter case, contractors tender at a loss intentionally so as to ensure they have work for their skilled staff to undertake. They reduce their profit margin, so the tender price is lower than the cost of undertaking the work and thus they are bound to make a loss. The rationale of this odd policy is that the contractor is achieving the short term aim of protecting his cash flow, albeit at the cost of his medium term profit (Lovatt, 2011, p. 1).

Contracting authorities, because of budget restrictions and in an effort to limit the cost of projects’ materialization, are striving to receive low prices in the tenders. This may be very welcome at one level, especially in times of economic downturn. However, if the tender proves to be economically unviable the client will be faced with cost escalation, and a performance that has adverse effects on the project quality or gives rise to constant disputes with the contractors (Giffin, N., 2010, p. 1).

Contractor’s financial loss leads to excessive pressures to save costs and reduced expenditure on quality, innovation, training, health and safety. These effects are passed on through the supply chain to sub-contractors that are squeezed, suppliers and employees. Small and medium size enterprises (SMEs) are particularly vulnerable because of their more limited financial resources and commercial strength. In addition, the contract scope is reduced where possible to reduce expenditures and contractors intend to charge the client for extra work outside the scope of the contract. Lastly, the cost of quality control during contract execution as well as the costs in use and maintenance will be higher (Harrower, 1999, p. 4).

The problems in the contract execution create friction between the contractual parties which very often leads to disputes between the client and the contractor. Because the client aims for the project to be completed he is not eager to drive those disputes to court, which is very time-consuming. On the other hand, the contractor’s main aim is to get paid out of the project. To ensure this, contractors use the possibility of going to court as a means of pressure to the client, knowing that the client is motivated to step back so as to preserve the project’s timely materialization.

From a legal perspective, the issue of ALTs is complex since the concept is regulated but ill-defined as the EU Directives do not provide a clear definition of what constitutes an ALT. Looked at from the client’s side, abnormally low might be regarded any tender priced at a level which leads the client to conclude that the project cannot be delivered in accordance with the contract, in the manner promised by the bid and for the whole duration of the contract. This contradicts the principles of sustainable procurement that aims for resource efficiency, improving quality of products and services and ultimately optimizing costs (United Nations Global Marketplace, 2010). Following this line of reasoning, the concept of ALTs can be related with the economic sustainability of tenders.
The Dutch construction industry is trying to improve the way in which projects are procured by introducing new competitive tendering processes. Value based tendering has been developed that is based on the Economically Most Advantageous Tender (EMAT) award mechanism. In the EMAT, bids further than the price criterion are also evaluated in context-specific quality criteria set by the client. Formulating qualitative criteria and combining them with price information in a transparent and proportional way is quite complex (Dreschler, 2009, p. 15). Most importantly, the EMAT mechanism still offers ground for unrealistic bids with contractors offering lower prices and/or higher quality.

Value based tendering was developed together with the transition to integrated contract forms that are currently dominant for infrastructure projects in the Netherlands. The key element of integrated contracting is that contractors are responsible for the design of the project. Linking design and construction in a contract makes these activities a ‘black box’ for the public client (Lenferink, 2013, p. 138). This can cause a loss of the client’s expertise in design and construction which leads to a decrease in the capability to manage procurement processes.

Integrated contracts make the estimation of cost in the early stage of tendering a difficult task for the client. Because the design is mostly done by the contractor the client does not have the necessary information to make precise cost estimation. In the absence of a detailed design in the client’s possession, the traditional bottom-up approach is not efficient anymore. As a result, clients that estimate the cost based on a reference design are faced with increased uncertainties in the process of evaluating the bids.

All together the aforementioned, make it very challenging for contracting authorities and the partnering consultancy companies to organize tendering processes in a way that contracts are awarded to competitive tenders, without adverse effects on the contract realization. In particular, identifying ALTs in an objective way that is in line with the European legislation and simultaneously does not discourage the market is a demanding task but necessary at the present juncture.

1.3. Research Objectives and Questions

Royal HaskoningDHV, a top engineering and consultancy service provider, has been widely involved in the procurement of large infrastructure projects. It has extensive experience in preparing the tender documents, formulating performance specifications and assessing the tender documents received. Moreover, RHDHV has specialized knowledge on carrying out cost estimates and providing legal advice in the context of integrated projects. For RHDHV that cooperates both with clients and contractors, it is crucial to work towards the direction of economically sustainable procurement so as to deliver greater value with benefit to all the involved parties and indispensably to the society.

The underlying assumption of this research is that dealing with the problem of ALTs is a step towards achieving economically sustainable procurement. However, the problem of ALTs has various aspects and accordingly there are several ways to deal with it during tendering. Firstly, the contracting authority may follow a proactive approach towards ALTs. This concerns how the client can organize a tendering process in a way that the submission of ALTs is avoided. Secondly, the client may opt for a retroactive approach, meaning that the focus of the contracting authority is on how to cope with an ALT that has been submitted, by taking measures to safeguard the project execution. Still, the focal point of the problem of ALTs remains the identification of such tenders, on which this thesis focuses.
Based on the aforementioned, the objective of this research project is to contribute to the direction of achieving economically sustainable procurement by elaborating on the identification of ALTs. In particular, the objective is to examine the potential of setting standards for the identification of ALTs and to formulate suggestions on how to improve the outcome of tendering processes. In relation to this objective, the main research question is formulated and has to be answered together with the sub-questions in which it has been decomposed.

**RQ.** In what ways can the contracting authorities objectify the detection of ALTs?

**SQ1.** What is the legal framework about ALTs?

**SQ2.** Which are the standards that can be used for the identification of ALTs?

**SQ3.** What are the implications of integrated contracts and the EMAT award mechanism for the identification of ALTs?

**SQ4.** In what ways can the procurement processes be improved to facilitate the identification of ALTs?

It is important to notice that the second and third research sub-questions in essence reflect two hypotheses of the thesis. The first hypothesis is that the problem of identifying ALTs can be dealt with in an objective way through the establishment of standards. The second hypothesis is that integrated contracts and the EMAT award mechanism have direct implications for the identification of ALTs. Thus, the answers to the research questions are expected to confirm (or reject) these hypotheses.

### 1.4. Report Outline

Following the introduction of this thesis, the second chapter unfolds the research design and strategy to reach the research objective. The third chapter deals with the necessary literature to obtain an insight on the key concepts of this research and the interrelations between them, being divided in four main sections. In the first section the basics of public infrastructure projects are discussed. Then the procurement processes are studied with a focus on the award mechanisms and the concept of ALTs. The third section refers to the transition from traditional to integrated forms of collaboration. In addition, the implications of integrated contracts for the procurement phase are viewed through the lenses of the principal-agent theory. The last part of the chapter presents and compares the main approaches and methods to estimate the project cost.

The fourth chapter elaborates explicitly on the legal framework about ALTs. Initially, European case law on ALTs is studied, while the rest of the chapter refers to the regulated standards on ALTs. This section includes an overview of the national legislation of the 27 EU members, together with an analysis of the proposal of the EU commission for a new Directive in public procurement. The fifth chapter discusses procurement of infrastructure projects in the Dutch context and then a brief chapter recapitulates on the research up to that point by presenting intermediate findings. Those constitute the input for the interviews presented and analyzed in the seventh chapter, based on which the conclusions of the research are drawn. Finally, in chapter eight the conclusions and suggestions of the report are presented, along with the proposals for further research.
2. Research Design

2.1. Introduction

This chapter describes how the research was organized and performed, based mostly on the guidelines described in the book “Designing a research project” (Verschuren & Doorewaard, 2010). Designing a research project involves the conceptual design and the technical design (Figure 2). The former determines everything that the researcher aims to achieve, while the latter concerns how to realize them. First, the conceptual framework within which the research was conducted is established. Then, the technical design involving the research strategy and the research material is presented. A detailed description of the method that was used to conduct different sets of interviews with legal and cost experts is given at the end of the chapter.

There are two broad categories of research, theory-oriented and the practice-oriented research, corresponding to theoretical and practical problems. When tackling a practice-oriented project the researcher may analyze a policy problem, diagnose bottlenecks in situations of change, make recommendations for improving an existing situation or evaluate a specific policy or intervention (Figure 3). The more realistic approach is to formulate suggestions for a design, based on a problem-analysis, a diagnosis of the causes and an assessment of a first prototype of the design.

When the project context consists of a complex problem encountered by a public or private organization, as it is the identification of ALTs, a practice-oriented approach is required. Often one wrongfully expects that the results of a practice-oriented research will solve a practical problem directly. However, research is not an instrument for solving problems. Research creates knowledge, insight and information. This knowledge does not solve the problem in itself, but it helps the problem solver to make the right decisions.
2.2. Conceptual Design

2.2.1. Research Objective

As stated before, the objective of this research is to contribute to the direction of achieving economically sustainable procurement by elaborating on the identification of ALTs. In particular, the objective is to examine the potential of setting standards for the identification of abnormally low tenders and to formulate suggestions for improvement of the outcome of tendering processes. The context of the research is the procurement of integrated contracts for transportation infrastructure projects in the Netherlands, using the EMAT award mechanism.

2.2.2. Research Framework

The steps that need to be taken to achieve the research objective are organized and visualized in the research framework. The research framework reflects the internal logic of the thesis by showing how the different parts of the research are interconnected (Figure 5). The core concepts of the research and the assumed relationships between them formulate the conceptual model, a focal part of the research framework (Figure 4). The conceptual model reads as follows: based upon the preliminary research, it was chosen to study the implications of the legal framework, the forms of collaboration, the cost estimation and the award mechanisms on the identification of abnormally low tenders.
Preliminary Research

The core concepts to be studied with respect to the identification of ALTs were determined by conducting a preliminary research. This research involved studying literature on the topic and conducting interviews with procurement experts from Royal HaskoningDHV and other organizations. The research strategy to be followed and the research material to be used were concluded together with the boundaries and limitations of this research. As it can be seen in Appendix (H) nine unstructured interviews were made with eight different experts.

2.2.3. Definition and Operationalisation of Key Concepts

It is particularly important to identify the core concepts of the research project and the assumed relationships between those concepts. This process is called defining and operationalising the key concepts of the research and helps to demarcate the research object.

Legal Framework

In the countries of the European Union, public procurement is ruled by national law and the European Directives established by the EU Commission. Thus, the Dutch Procurement Act and the current EU Directive on public procurement are studied. The articles that are of interest for the research are mostly those referring to the award mechanisms and to the phenomenon of ALTS. Currently, the EU commission is finalizing the proposal for a new EU Directive on public procurement which is of interest because it involves a revision of the article on ALTs.

The provisions of the EU Directive are bounding for projects the budget of which exceeds certain thresholds (see Appendix C). This research concerns projects above the thresholds for which complying with the EU Directives is imperative. In the article of the EU Directive about ALTs, the case of bidders having obtained illegal State Aid is analyzed thoroughly as a definite reason to characterize tenders as abnormally low and is not of interest for this thesis.
Because the EU Directives refer to the phenomenon of ALTs without providing any definition of what really constitutes an ALT, relevant cases have been brought to the European courts several times. Consequently, in order to analyze the legal framework on ALTs referring to European case law is necessary. Moreover, in the national Legislation of the EU members different approaches and standards are prescribed for the identification of ALTs. Thus, the national Legislation of the 27 EU members on ALTs is reviewed.

**Integrated Contracts**

During the last two decades a transition has taken place from traditional to more integrated contract forms. So as to get a better insight on the complexities that integrated contracts create during tendering, the issue is examined through the lenses of the agency theory. In the Netherlands, the two main types of integrated contracts are Design & Construct (DC) and Design – Build – Finance & Maintain (DBFM). Two of the main characteristics of integrated contracts are that the design is also put into tender and the contract duration is longer. As a result the phase of tendering is much more decisive and crucial than it used to be in traditional contract forms. For this research it is of special interest to examine the implications of integrated contracts for the cost estimation.

**Cost Estimation**

A key concept of the research is the process of estimating the project cost in the tendering phase. The reasoning lies on the fact that a focal criterion in evaluating the received bids and identifying ALTs is the price offered in the tenders. Recently the traditional deterministic approach has started to give its place to a probabilistic calculation of the cost. The two approaches, together with the three main methods of cost estimation, namely the build-up, analogy and parametric method are described.

The cost estimates prepared by the client and the contractor during tendering differ, a factor that makes the evaluation of bids and the identification of ALTs much more complex. The two parties base their estimate on a different level of information available and on a different project scope, as the project is to yet be designed in the case of integrated contracts. At the same time, clients and contractors apply different methods to calculate the cost. In the Netherlands, public clients estimate the cost of a project by making extensive use of the SSK model that is shortly presented.

**Award Mechanisms**

Also, the two award mechanisms prescribed in the EU Directives, namely the Lowest Price (LP) and the Economically Most Advantageous Tender (EMAT) are described. The boundaries of this research involve projects that are procured with the EMAT mechanism. The reason is that the new Dutch Procurement Act that came into force while conducting the research, provides that clients shall apply the EMAT mechanism, otherwise they need to substantiate their decision to use the lowest price. The EMAT mechanism combines the price criterion with qualitative criteria to evaluate tenders, which enhances the complexity of identifying ALTs.
2.3. Technical Design

2.3.1. Research Strategy

The research strategy involves a set of decisions concerning the way in which the research is going to be carried out. This refers mostly on whether the research strives for depth or breadth in the analysis and whether the method to conduct the research is quantitative, qualitative or mixed. Those aspects are interrelated since the qualitative methods offer themselves to analyze a subject in depth (Figure 6). This thesis has the characteristics of qualitative research even though some quantitative analysis is being done with respect to the mathematical standards that can be used to identify ALTs.

![Figure 6: Difference between qualitative and quantitative research methods (Galt, 2009)](image)

The identification of ALTs is a complex problem that in order to be solved requires much more than setting mathematical standards. The process of treating tenders that raise suspicions of being abnormally low is even more important that the indicators that may be used to identify such tenders. Thus, it was decided to perform a qualitative, in-depth research. Moreover, the characteristics of the problem would not allow for generalized results and a quantitative approach. The problem of treating ALTs is context-specific meaning that the type of project, the form of collaboration between client and contractor and the way the procurement process is organized are of influence.

In qualitative research the way to obtain and process the necessary data differs in comparison to quantitative research (Figure 7). When the research method involves interviews, as in this thesis, the questions are open-ended, which means they are lacking a pre-structured set of answer possibilities. Instead, a quantitative approach would be based on a survey consisting of closed-ended questions. The analysis of the information stemming from the interviews strives to identify and interpret patterns, but is not based on statistical means, as it is the case with surveys.

![Figure 7: Research methods (Creswell, 2009)](image)
2.3.2. Research Material

Initially, an extensive literature study is conducted on the key concepts of the research (Figure 4) to establish a theoretical background. Then, the legal framework on ALTs is presented in a distinct section based on content analysis of textual documents. The European Case Law on ALTs is examined by reviewing the rulings of the court, while the overview of the national Legislation of the 27 EU members was derived from the official legal documents. Lastly, two versions of the proposal of the EU commission for a new procurement Directive are studied complemented by an interview with a representative of the EU commission. A separate chapter provides more practice-oriented information about the procurement of transportation infrastructure projects in the Netherlands. The main sources of data are content analysis of documents, along with relevant literature and information provided during the preliminary interviews. The intermediate findings of the research up to this point constitute an input for the interviews with legal and cost experts.

Interviews - Delphi Method

Two main points of focus of this research is the legal framework and the cost estimation which led to conduct interviews with legal and cost experts. The legal framework is important as the concept of ALTs is regulated and thus any attempt to treat the issue needs to be in compliance with the legislation. On the other hand, the cost estimate is evidently important for the client to evaluate the tenders received and specifically to identify ALTs.

The research method that was used is based on the principles of the Delphi technique, a group process used to collect the opinions of experts on a particular subject. According to Linestone and Turoff (2001, p. 3) “Delphi may be characterized as a method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem”. There are different areas of application among which are gathering current and historical data not accurately known or available and delineating the pros and cons associated with potential options (Yousuf, 2007, p. 2). Among the objectives of the interviews is to gather information about the deviation of a bid that raises suspicions that it may be abnormally low.

The Delphi method is beneficial when other methods are not appropriate to collect data. It is adequate for this thesis, since the problem of ALTs does not lend itself to precise analytical techniques, but can benefit from subjective judgments on a collective basis. It is also valuable because legal and cost experts represent diverse backgrounds of expertise and thus a group meeting would not lead to an effective communication and a satisfactory outcome. Delphi helps to avoid group thinking as there are no dominant people in the “discussion”. Finally, the fundamentals of the method allow for anonymity of the participants.

There are several forms of the Delphi method depending on the purpose of the study. Nevertheless, the process for each type of Delphi is essentially the same. The process involves typically two or more rounds of consultation with experts, either through interviews or through questionnaires. There are no provisions about the size of the group of experts participating in the research. Mostly it depends on the heterogeneity of the group, meaning that more homogeneous samples require fewer participants and most often two rounds of contact. If different disciplines are involved in the sample, then those disciplines should be represented in a proportional way.
In order to get a comprehensive view of the subject it was decided to contact experts both on the clients’ and on the contractors’ side (Figure 8). A proportional number of legal and cost experts are interviewed based on two different sets of questions, among which several are in common. The participants are among the most experienced in the field of procurement of infrastructure projects. The legal experts are chosen based on consultation with Monica-Chao Duvis, the Director of the Dutch Institute for Construction Law (IBR) and Johan Hekker, the Director of the Advisory Group on Infrastructure in RHDHV. The cost experts that are contacted are members of the Dutch Association of Cost Engineers (DACE), specialized in infrastructure and particularly in cost estimation during tendering. They are chosen after consultation with Gerard Filé from RHDHV, member of the Board of DACE. Detailed information about the interviews are provided in the homonymous chapter.

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*Figure 8: Interviews Map*
3. Literature Study

3.1. Infrastructure Projects

Public infrastructure refers to the basic physical and organizational structures needed for the operation of a society, and the services and facilities necessary for an economy to function. Typical examples are large transport projects, energy projects, water management, communication etc. A common denominator of those projects is the fact that they are developed as networks to contribute in the economic growth and improve quality of life. The focus of this thesis that is transportation infrastructure, generates employment, reduces the cost of production, allows diversification, which is a key to the economy’s ability to adjust the equilibrium between demand and supply, and above all is valuable on its own right.

Large transportation infrastructure constitutes a necessary condition for both social and economic development. This justifies the huge investments that are made in transport projects that correspond to a large proportion of governments’ budget. Those projects are complex and require the consideration and integration of many aspects of engineering, economics, finance, sociology and management. Demand and the need to mitigate problems must be correctly interpreted, technical insight is imperative to generate feasible solutions and economic/financial insight is necessary for the efficient use of resources. The quality of infrastructure projects depends on this insight to steer decision making, but also on the quality of the proposed alternatives, especially during procurement.

The importance of infrastructure for the economic activity was recognized already in 1776 by Adam Smith in the famous “Wealth of Nations”. Smith underlined that public works like roads, bridges etc. are of such a nature that “the profit could never repay the expense to any individual or small number of individuals, and which it therefore cannot be expected that any individual or small number of individuals should erect or maintain” (p. 590). Thus, the involvement of the public for the development of transportation infrastructure is imperative.

In the past, public infrastructure projects were financed and constructed completely by the state. The large capital needed together with the cost overruns and demand shortfalls often caused by optimism bias and strategic misrepresentation, resulted in frequently haunted public infrastructure projects (Flyvbjerg et al. 2003). Thus, the private sector started to get involved in the public works to enhance strategic and construction management in a way that would result in successful public works in terms of quality, time and cost. The private sector opts for profit and continuation of business turnover and so private construction companies are generally unwilling to undertake projects that could result in losses or would not develop a revenue stream.

In the recent years, the internalization of economies, the united European market and the limited national budgets have resulted in the creation of new ways of cooperation between the public and the private sector for infrastructure development. Simultaneously, the neoliberal political agenda implied the redistribution of several tasks to the private sector (Lenferink, 2013, p. 128). Nowadays it is often that public infrastructure projects are designed or even financed by the private party that assumes substantial technical and financial risk in the project. This integrated approach on projects has noticeable implications on the procurement process.
3.2. Procurement Processes

Hordijk, P. et al. (2004) define procurement as the act of purchasing goods or services from an outside body by the government with a specified contract and a specified award procedure. In this definition, the government comprises traditional state authorities (state and regional), bodies governed by public law and associations of these first two bodies. Based on this definition, in contrast with relevant concepts as acquisition, buying or purchasing, procurement is always ‘public’.

At the moment, the European procurement procedures are regulated by Directive 2004/18/EC which is based on Court of Justice case-law on award criteria (Recital 1 of the Directive). The Directive clarifies the possibilities for the contracting authorities to meet the needs of the public concerned, including sustainability criteria (economic, environmental and/or social) provided that those criteria are linked to the subject of the contract. As indicated in Recitals (1, 2) of the Directive those criteria should not confer an unrestricted freedom of choice on the contracting authority, but need to comply with the fundamental principles of the Treaty and in particular to:

“... the principle of freedom of movement of goods, the principle of freedom of establishment and the principle of freedom to provide services and to the principles deriving there-from, such as the principle of equal treatment, the principle of non-discrimination, the principle of mutual recognition, the principle of proportionality and the principle of transparency.”

Articles 28-34 of the Directive define the procurement procedures, among which the open and the restricted procedure are the most common. In specific cases, mostly when the project complexity is high, contracting authorities may apply a competitive dialogue or other procedures. Most importantly, article 28 states that the contracting authorities shall apply their own national implementation of the procurement procedures adjusted to the purpose of the Directive. In some of those procedures, the award phase is preceded by a selection (pre-qualification) phase. As indicated by Dreschler, M. (2009, p. 19) during the selection phase suppliers are selected by focusing on their properties, while during the award phase focus is on properties of the proposal submitted.

Article 7 of the Directive sets the threshold values for public contracts. Contracts with an estimated value that is higher than the threshold have to comply with European regulation. Contracts below the threshold have to comply with the national regulation, which normally is less restricted. The threshold values are updated yearly. The current threshold values published in 2012 are mentioned in Appendix (C). In terms of this graduation project our focus is on contracts above the EU threshold.

At this point, it is necessary to mention that the EU Directive on public procurement will be revised by a new Directive, the proposal for which is currently under finalization. The new Directive will serve the aims of the strategy “Europe 2020: A strategy for smart, sustainable and inclusive growth” as entitled by the EU Commission. Different versions of the proposal for a new Directive have been published and include a revision of the article about ALTs as it will be discussed in chapter (4).

* The term client, contracting agency and contracting authority are used interchangeably throughout the text to refer to the party that organizes the tendering process.

* The term contractor and bidder are used interchangeably throughout the text. In a legal context this is incorrect as the term contractor should only be used after the bidder has been awarded the contract.
3.2.1. Award Mechanisms

In general, the objective of an award mechanism is to grade the bids submitted by the tenderers and to select the best based on certain criteria, as illustrated in the Figure 9 below.

*Figure 9: The function of an award mechanism is to grade the bids (Dreschler, 2009)*

The Directive 2004/18/EC provides that the award of public contracts shall be based either on the criterion of the Lowest Price (LP) or the criterion of the Economically Most Advantageous Tender (EMAT). Dreschler M. (2009) briefly describes and visualizes (Figures 10 & 11) the differences between the two mechanisms. The evaluation technique in the LP mechanism simply consists of rejecting bids that do not comply with the Terms of Reference (ToR) and selecting the cheapest bid. The EMAT award mechanism, besides price and conformance with the ToR, also takes other criteria into account. The evaluation technique combines the performance and price information into a preference ranking, applying some mathematical formula.

*Figure 10: The lowest price award mechanism (Dreschler, 2009)*

*Figure 11: The Economically Most Advantageous Tender award mechanism (Dreschler, 2009)*
Specifically, article 53.1 of the Directive 2004/18/EC states that:

“...the criteria on which the contracting authorities shall base the award of public contracts shall be:

(a) when the award is made to the tender most economically advantageous from the point of view of the contracting authority, various criteria linked to the subject-matter of the public contract in question, for example, quality, price, technical merit, aesthetic and functional characteristics, environmental characteristics, running costs, cost-effectiveness, after-sales service and technical assistance, delivery date and delivery period or period of completion, or

(b) the lowest price only.”

The list of criteria that formulate the EMAT award mechanism is non-exhaustive and is dependent on the subject that is procured and the type of the contract. As the European Court of Justice (ECJ) has explained in article 33 of the EVN/Wienstrom case¹ (Appendix D), the economically most advantageous tender does not imply that every criterion should be economic. “Secondary” criteria can be taken into account if they are linked to the subject of the public contract and they are fixed in the contract notice or contract documents. The Directive 2004/18/EC, in article 53.2, provides details on the application of the EMAT mechanism with respect to the award criteria:

“... the contracting authority shall specify in the contract notice or in the contract documents or, in the case of a competitive dialogue, in the descriptive document, the relative weighting which it gives to each of the criteria chosen to determine the most economically advantageous tender...”

Different forms of the EMAT mechanism can be encountered in practice. Doornbos (2005) presented three main forms, namely a point system, a ratio system and a price correction system. The point system expresses both quality and price in points and the bid with the best combined score is the winner. In the ratio system the total value of a bid, meaning the ToR value plus the added value is expressed in a number which is divided by the price. The bid with the highest ratio wins. The price correction system rewards the added value of bids, further that the value that corresponds to the ToR. This added value is expressed in fictitious monetary terms to be subtracted from the price so as to award the bid to the lowest corrected price. Expressing extra performance in monetary terms is more comprehensible for everyone involved and easier to ‘defend’ (Dreschler, 2009, p.117). As a result, the price correction system is dominant in the Netherlands.

¹ Case C-448/01, EVN AG and Wienstrom GmbH v. Republic of Austria, Articles 30, 32, 33, Available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:62001J0448:EN:HTML
3.2.2. Abnormally Low Tenders

In the course of evaluating the submitted tenders the contracting authority examines if those tenders fit to the conditions which were published in the contract notice. If a tender appears to be abnormally low, it may affect its validity (Juhasz, A. 2009, p. 59). However, there is no clear understanding of the nature of the problem and how it should be dealt with, within the law. Thus, ALTs are abhorred by contracting authorities and bidders, among which there is an amorphous consensus that ALTs should be despised (Golden, J., 2012, p 1).

The EU Commission created a Working Group on ALTs, which preceded the current EU Directive. As it indicated by the title the Working Group’ report, the problem of ALTs can be broken down to three parts which are the: “Prevention, Detection and Elimination of Abnormally Low Tenders” (Harrower, J. 1999, p. 10). This research focuses on the second part of identifying ALTs. In the report, a tender is assumed to be abnormally low if:

· “in the light of the client’s preliminary estimate and of all the tenders submitted, it seems to be abnormally low by not providing a margin for a normal level of profit and
· in relation to which the tenderer cannot explain his price on the basis of the economy of the construction method, or the technical solution chosen, or the exceptionally favorable conditions available to the tenderer, or the originality of the work proposed.”

The first condition which refers to the margin for profit out of the project is related to the economic sustainability of tenders as viewed from the contractor’s perspective. Especially in times of economic recession contractors may abolish their margin for profit to bid lower and win the contract. Potential reasons are to maintain turnover in the short term, keep the workforce employed, enter a new market and eliminate competition (Golden, J., 2012, p. 5). In this research, ALTs are viewed from the side of the contracting authority and thus the lack of a profit margin will only be examined as a risk for the project realization and not as an indicator of whether a tender is abnormally low (see part of § 3.3.2.2 about ‘Construction/Operation Stage’).

Bidders may submit ALTs deliberately, due to reasons as the ones listed above, or unintentionally. In the latter case, the causes may relate to errors by the tenderer, differing views of risk, inadequate and ambiguous tender and contract documentation, etc. (Figure 12). The borderline between intentional and unintentional “mistakes” is very thin for the contracting authorities to distinguish. For instance, risks can be underestimated and contract specifications can be “misunderstood” by the bidders accidentally or on purpose. From the client’s perspective, the challenge is to organize tendering processes in a way that limits the space for underbidding, either strategic or not.

| Inadequate and ambiguous tender documentation | (Harrower, J. 1999) |
| Inadequate time to tender | (>>)
| Use of the LP instead if the EMAT tender mechanism | (>>)
| Deliberate under-pricing | (Golden, J., 2012) |
| Differing view of risks | (>>)
| Errors by tenderers | (Gunduz & Karacan, 2009)
| Inaccuracy of conceptual cost | (>>)

Figure 12: Categories of reasons for the submission of ALTs
The second condition set by the Working Group for the identification of ALTs formulated the basis for article 55 of the current EU Directive 2004/18/EC (Appendix C), which provides that:

“If, for a given contract, tenders appear to be abnormally low in relation to the goods, works services, the contracting authority shall, before it may reject those tenders, request in writing details of the constituent elements of the tender which it considers relevant. Those details may relate to:

(a) the economics of the construction method, the manufacturing process or the services provided;

(b) the technical solutions chosen and/or any exceptionally favorable conditions available to the tenderer for the execution of the work, for the supply of the goods or services;

(c) the originality of the work, supplies or services proposed by the tenderer;

(d) compliance with the provisions relating to employment protection and working conditions in force at the place where the work, service or supply is to be performed;

(e) the possibility of the tenderer obtaining State aid.

As indicated by Golden (2012, p. 11) those ‘details’ are related to the subject matter of the contract, except possibly (d) and definitely (e). Because (d) and (e) are clearly reasons for tenders to be abnormally low, they do not concern this research. Even though the aspects of a tender to be examined are listed in article 55, it is not clear which tenders shall be investigated. The etymology of the phrase abnormally low tender suggests that the tender must be abnormally low ‘in comparison to something’ (Golden, J., 2012, p. 2). In other words, there must be some datum in relation to which the tender vastly deviates downwards.

In the absence of a commonly acceptable definition individual countries use different methods to grab the main characteristics of ALTs. Within the 27 EU members absolute and relative systems for the identification of ALTs can be distinguished. In the former case, the contracting authority’s examination expands only on the given tender per se. Unlike, relative systems correlate the tender to the other tenders received (Juhasz, A. 2009, p. 59). An overview of the national legislation of the 27 EU members on ALTs can be found in chapter (4). In the literature and the EU Directives, ALTs are examined regardless of the form of collaboration between the contracting agency and the bidder. In the terms of this research ALTs were studied explicitly in the context of integrated contract forms.
3.3. Forms of Collaboration between Client and Contractor

Every form of collaboration involves an agreement between the parties involved. The simplest form of agreement is that of a sales agreement, in which a client decides on whether to obtain a ready-made product. A collaboration agreement is much more complicated as the subject of the agreement is developed over time in the context of the collaboration. In a collaboration agreement there are mutual dependencies between the parties and the agency theory is highly adequate to describe the relationship between the collaborating parties. In the context of the agency theory, the agent (contractor) incurs costs so as to develop a concept, which has enough value for the principal (client) to justify him paying for the price asked for it (De Ridder and Koppen, 2008, p. 8).

The nature of the collaboration takes place in between two extremes: either the client carries out all the work himself, or he puts it out to tender. Within these extremes a number of standardized forms of collaboration can be encountered (De Ridder and Koppen, 2008, p. 9). For many years, the construction industry was dominated by the traditional Bid-Build model. There, the client provides most of the design details and the contractor executes the works in accordance with that design. During the last decades more integrated contract forms have been developed, in which the contractor performs several tasks further than the construction. Because the client often wants to get involved in some of those tasks, one could speak of a scale of ascending involvement.

The traditional Bid-Build model is the starting point for this scale, while further in this scale more integrated contract forms can be found. The most common integrated contract form is the Design-Build model where the client only indicates his requirements and the contractor is responsible for most of the design and construction of the works. Even further, the Finance, Maintenance and/or Operation of a project can be outsourced to the contractor(s), as it can be seen in the Figure 13.

![Figure 13: Integrated contract forms in the infrastructure project lifecycle (De Ridder & Koppen, 2008)](image-url)
### 3.3.1. Traditional Contracts

The principal characteristic of traditional Bid-Build contracts is the uniform way in which this model is drawn up and the clearly separated functions of the parties (De Ridder and Koppen, 2008, p.49). The client is responsible for the design and the provision of the tender package. The contractor, on the other hand, “designs” the method of construction, makes the planning schedule for the works and executes the works in accordance with the contractual agreement, i.e. the technical and administrative conditions. There are three distinct project phases: the design, the tender and the construction phase.

In this model the well-defined, legally separated tasks ensure that a sound process is followed. However, this implies that the parties involved in each stage need to finalise all the tasks before moving on to the next one. This strict separation between design and construction causes a rather static process. In addition, the fragmentation between the project stages leads to a low level of collaboration between the contractual parties. Finally, in complex projects Bid-Build contracts can lead to high costs of additional work that can cause conflicts between the client and the contractor (De Ridder and Koppen, 2008, p. 50).

The fact that the design is provided on behalf of the client, implies he is actively involved in the realization of the project. Not only is the client responsible for the design provided to the contractor, but also needs to supervise the project execution based on the design. The involvement of the client requires both expertise, as well as staff capacity, which is not always desirable. Thus, integrated contracts have been developed to outsource different tasks and responsibilities to the contractor(s).

### 3.3.2. Integrated Contracts

As already mentioned, at the end of the 1990s the Western governments’ core competences were reassessed, leading to the distribution of several tasks and responsibilities to the private sector (Lenferink, S. et al. 2013). As a result, executive departments were transformed to agencies, with Rijkswaterstaat in the Netherlands, Highways Agency in the UK and Transport Scotland being typical examples. This transformation had implications on the way infrastructure projects are delivered. Especially the impact on the procurement phase has been radical, involving a transition from traditional to integrated contracts. This required a shift of mindset by the contracting agencies.

In an integrated contract the client describes his problem and develops functional requirements for the project. Then, the contractor needs to find a solution for the client’s problem by carrying out the design, construction and delivery of the project. In some cases, the contractor is also responsible for maintenance, operation and financing of the project. The reason for this forward integration of project stages is that it is expected that private contractors are able to identify and develop innovative solutions, deliver the project earlier and at a lower cost. The construction process under those types of contractual agreements is more dynamic, while time and quality can be gained by integrating detailed design and construction (De Ridder & Koppen, 2008, p. 53).

An indicative definition of integrated contracts has been provided my Chao-Duivis, M. (2011):

“Integrated contracts can be defined as contractual arrangements for project delivery methods where two or more of the various components – design, construction, maintenance and operation – will be produced by a public authority under a single contract.”
The integrated character of the contract has also some drawbacks. Linking design and construction in a contract makes these activities a ‘black box’ for the public client (Lenferink, 2013). This may cause a ‘loss of the client’s expertise in design and construction which can lead to a decrease in the capability to judge quality of bids and guide following stages. Another issue is the creation of interdependencies between different parts of the project. As a result, delays in one part of the project can cause additional delays or even lead the project to a standstill.

Often in the design phase the opinion is held that realistic reductions in the construction costs could be obtained in the process through optimisation (De Ridder and Koppen, 2008). Nevertheless, the largest uncertainties arise in the design stage and thus most of the risks can be found and need to be treated here. This approach often leads in a moment at which the cost graph is highly different that the one originally established (Figure 14). As a result, the different disciplines are unable to proceed further and very high costs have to be made to accomplish the project in a reasonable way.

![Cost vs Time Graph](image)

*Figure 14: Estimated versus actual costs in a Design-Build task structure (De Ridder & Koppen, 2008)*

### 3.3.2.1. Agency Theory

The collaboration between the client and the contractor for the materialization of construction projects has the characteristics of a principal - agent relationship. In this section we intend to gain an insight on the complexities that integrated contracts create during procurement, by looking through the lenses of the agency theory.

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* The term ‘agent’ is used in the context of the economic and not the law theory.

As it is stated in the working paper “Procurement in Infrastructure” (The World Bank, 2009)

“Traditional economic theory has characterized procurement as a principal-agent relationship where the government, as a benevolent principal, intends to accomplish a piece of public work that cannot be performed by itself and therefore delegate the task to an agent, which could be either a government employee or a private company.”
According to Jensen (2003), the agency problem refers to this kind of relationships in which there is:

“...a contract in which one party (the principal) engage another party (the agent) to take actions on behalf of the principal that involve the delegation of some decision-making authority to the agent”

As it is noticed by Walker (2000, p. 527), the fundamentals of the agency problem stem from the misalignment of the objectives of the principal and the agent. Both are assumed to be attempting to maximize their own benefits. This is not necessarily problematic by itself if all features of the behavior and performance of the principal and the agent that are relevant to their relationship are observable by the other party. Unfortunately, the reality has proven to be different as there is information asymmetry between the two parties.

The fact that most business settings are characterized by incomplete information and uncertainty gives rise to two problems: adverse selection and moral hazard. Adverse selection is the condition under which the principal cannot ascertain if the agent accurately represents his ability to do the work for which he is being paid. Moral hazard is the situation in which the principal cannot be sure if the agent has put forth maximal effort (Eisenhardt, 1989). The agency theory was developed in the context of the private sector to analyze the economic relationship between a manager (principal) and an employee (agent). However, it is applicable in different contexts that may involve the relationship between different public parties or the interface between public and private parties.

The agency problem is encountered in both conceptual/feasibility phase of a construction project and the subsequent tendering phase. However, different actors constitute the principal and the agent in each phase. Even though our focus is on tendering, we will also refer shortly to the preceding conceptual/feasibility phase and the succeeding construction/operation stage. The reason is that there is an evident impact of the conceptual/feasibility phase on the tendering phase and an evident impact of both on the construction/operation phase. Additionally, the analysis will provide an insight on the fact that the phenomenon of ALTs has the characteristics of an accountability problem.
3.3.2.2. Procurement of Integrated Contracts

Conceptual/Feasibility Stage
In the context of public infrastructure, multiple agency relationships can be identified already during conceptual/feasibility stage. The one arises between the general public and elected representatives (the government) and the other between elected representatives and contracting authorities. However, we assume that the government expresses the general public. Thus, the analysis in this section considers the government to be the principal and the contracting authorities to be the agent, who advices the government on the decision whether to materialize which project and in what form.

Before the decision to proceed with the realization of an infrastructure project, the financial feasibility needs to be examined based on the conceptualization of the project. The key variables of financial viability are costs and benefits. Project promoters and forecasters are responsible to determine the estimated costs and revenues and communicate them to the principal. One of the most significant pieces of research in the field of infrastructure projects, presented by Flyvbjerg et al. (2003), focuses on cost overruns in large transportation projects. The explanations for those overruns are categorized in four groups, namely technical, economic, psychological and political reasons.

In a follow up study by Cantarelli (2010, p. 12), political explanations are characterized as dominant and the agency theory is recommended to understand cost overruns. The asymmetric information makes it possible for agents to deliberately under-budget their projects so as to see them realized. This is more of a rule than an exception, as Flyvbjerg (2003, p. 23) states that the cost estimates used in decision making for transport infrastructure development are highly and systematically deceptive. An intrinsic part of examining the viability of infrastructure projects is the risk identification. Project promoters seem to provide inadequate and misleading information regarding the risks involved.

Based on the aforementioned, Flyvbjerg concludes that the problem of cost overruns in infrastructure is mainly one of risk-negligence and lack of accountability. The result is the materialization of high risky, underperforming projects that may not even be economically viable under the agreed form. This inevitably leads to the misallocation of budget resources, which produces losers among those financing and using infrastructure, be the taxpayers or private investors.

Tendering Stage
During tendering, contracting authorities apart from acting as an agent of the government constitute the principal that engages the bidders (agent) to submit the most valuable offer. In tender processes asymmetry of information refers to the fact that the client is unable to access all relevant information possessed by the contractor before signing the contract. This gives the contractor the chance to make strategic adjustments to his tender. In terms of the economic downturn that pushes prices downwards strategic adjustments on a tender refer to the practice of contractors to bid below cost to win the contract.

The concept of information asymmetry aptly describes the complexities that integrated contracts create during tendering. Firstly, the client has very short time to evaluate tenders based on a reference design that differs from the design and scope of the tenders. It is logical that differences in the scope result in deviations in the estimated project costs. Secondly, the client cannot have insight on possible optimizations of the construction process that contractors take into account when building up their bids. In conclusion, the client’s task to evaluate bids turns to be very demanding.
At this point, it needs to be considered that both the client and the contractor aim for the lowest cost of a project. The contractor aims to lower the project cost to get the contract and ideally to maximize the profit margin. The client on the other hand, has to deal with budget restrictions, especially in the case where the cost has been underestimated during the conceptual/feasibility stage. Thus, the clients tend to be tempted by low offers at the tendering stage and may undermine the implications of opting for a fallacious tender on the subsequent construction/operation stage.

**Construction/Operation Stage**

Choosing a fallacious low bidder greatly raises the risk of moral hazard during the post tender period. Moral hazard refers to the fact that the effort made by the agent during contract execution cannot be fully observable to the principal. The contractor has the chance to behave strategically to save costs and thus preserve profit, which is described by Walker, B. (2000) as rent seeking behavior. During tendering competition among the bidders creates monopoly rents which accrue to the principal. The winning bidder can only secure a redistribution of these rents in his own favor ex post by, in effect cheating on the contract (Walker, B., 2000, p. 533).

In practice cheating on the contract can take various forms such as: producing a lower level of quality or delivering the quality required but claiming that particular tasks are ‘variations’ falling outside the contract specification and thus are not subject to the prices agreed (Giffin, N., 2010). Also the possibility of renegotiating the contract is quite high. This strategic behavior of the agent is a matter of information asymmetry as well. Contractors possess technically professionalized information on the tasks and elements of the construction/operation in which costs can be saved, that clients cannot posses (Rui Mu, 2008, p. 96).

When a contractor claims greater cost recovery for variations or specification changes than the principal is willing to pay, together with the risk of cost overrun costly disputes follow. Those lead to late delivery, extended post-contractual negotiations to resolve disputes and/or judicial proceedings (Regan, 2012, p. 3). The adversarial relationship is not necessarily confined to the principal and contractor. Friction may be incurred in the relationships between the contractor and sub-contractors. This limits opportunities for collaboration and innovation impairing the project quality.

<table>
<thead>
<tr>
<th>Contract scope is reduced</th>
<th>(Golden, 2012)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower level of quality delivered</td>
<td>(Giffin, 2010)</td>
</tr>
<tr>
<td>Claims for extra work outside the scope of the contract</td>
<td>(Giffin, 2010)</td>
</tr>
<tr>
<td>Reduced expenditure on quality, innovation, training, health and safety</td>
<td>(Harrower, 1999)</td>
</tr>
<tr>
<td>Higher costs on quality control, operation and maintenance</td>
<td>(Harrower, 1999)</td>
</tr>
<tr>
<td>Sub-contractors are squeezed</td>
<td>(Harrower, 1999)</td>
</tr>
<tr>
<td>Disputes between the client and the contractor</td>
<td>(Regan, 2012)</td>
</tr>
<tr>
<td>Renegotiation of the contract</td>
<td>(Regan, 2012)</td>
</tr>
<tr>
<td>Contractor facing bankruptcy</td>
<td>(Giffin, 2010)</td>
</tr>
</tbody>
</table>

*Figure 16: Detrimental effects of ALTs on a project level*

It becomes evident that a critical parameter in all project stages is cost. The quality of many decisions made about the projects is influenced by the accuracy of the cost estimates. However, the process of estimating the cost is complex especially in infrastructure projects which are unique, face many uncertainties, involve the public as users and have a very long lifetime (De Ridder and Koppen, 2008).
3.4. Cost Estimation

3.4.1. Introduction

Estimations of the cost are made by clients and contractors in different stages of a project, in various ways and for different purposes. According to the United States Government Accountability Office (GAO, 2009, p. 47) cost estimates have two general purposes: (1) to assist the evaluation of performance against plans or the selection between alternative solutions, and (2) to support the budget process by providing estimates of the costs that need to be incurred to efficiently execute a project. The purpose of the cost estimate determines the scope and the level of detail.

There are three main methods to come up with a point estimate of the cost: analogy, engineering build-up and parametric, and two approaches to determine a range of possible costs around the point estimate: deterministic and probabilistic. The characteristics of those methods, their advantages and disadvantages, as well as their applicability on the different stages of the life-cycle will be analyzed in the following sections.

The stage in the life cycle of a project when the cost is estimated has an impact on the level of detail, the data introduced and the estimation method. Early in the life cycle the definition of the works involved in the project is less concrete, thus a cost estimate at this point will probably not require extensive detail since an extensive technical description of the project is lacking. Because of the complexity of cost estimation, whatever method is selected, a secondary cross-check method needs to be used to gauge the output obtained from the primary method (Nicholls, 2009, p. 15). In practice, it is very common to pull all the methods together to develop and validate the cost estimate.

The challenges that cost estimators face have to do both with the project that is costed and the database of cost elements to be used. Deriving high-quality cost estimates requires access to a detailed database of other projects to develop analogies, engineering build-up analyses or parametric relationships. Project-specific factors are mostly related to the design and include vagueness in scope, design complexity, and project size. Due to those factors assumptions need to be made by cost analysts, which require a combination of scientific expertise and judgment. Reality proves that the results are seldom very precise and thus the goal is to find a “reasonable” answer to the question how much a project will cost.

Figure 17: Challenges cost estimators typically phase (GAO, 2009)
3.4.2. Cost Estimation Methods

3.4.2.1. Build-up Method

The engineering build-up method ‘builds’ the overall cost estimate by summing detailed estimates done at lower levels of the WBS and is also known as the bottom-up method. A build-up estimate consists of labor and material costs that have overhead and fee added to them. The material parts are allocated based on how the work will be accomplished, so quantities and schedule have to be taken into account. The method is applicable when the estimator has enough detailed information about the project - such as the number of hours and parts - and the construction process to be used. The underlying assumption of this method is that historical costs are good predictors of future costs.

The main advantages of the build-up technique include (GAO, 2009, p. 111):

- The estimator’s ability to determine exactly what the estimate includes and whether anything was overlooked.
- That it gives good insight into major cost contributors.
- Easy transfer of results to other projects.

Some disadvantages of the engineering build-up method are that (GAO, 2009):

- It can be expensive to implement and it is time consuming.
- It is not flexible enough to answer what-if questions.
- New estimates must be built for each alternative.
- The project specifications must be known in detail and remain stable.
- Small errors can grow into larger errors during the summation.

3.4.2.2. Analogy Method

An analogy takes into consideration that every project, regardless of the level of innovation that may be involved, is not a totally new system. Most of the projects constitute an evolution of previous projects with new features added on or a new combination of existing components. This method relies a great deal on the expert’s insight and experience used to draw analogies when modifying the existing project data to approximate the new project’s scope. If feasible, the adjustments should be quantitative rather than qualitative to limit subjective judgments as much as possible.

The analogy method is typically used in the early stages of a project’s life-cycle, when the level of specificity of information is low but the scope of the project is defined in general terms. The necessary adjustments should be made objectively by using scaling parameters and factors that represent differences in size, performance, complexity or technology involved. It is very common that analogy is used as a cross-check method for other methods.

The analogy method has several advantages (GAO, 2009, p. 109):

- It can be used before detailed project requirements are known.
- If the analogy is strong, the estimate will be defensible.
- An analogy can be developed quickly and at minimum cost.

Analogies also have some disadvantages (GAO, 2009):

- An analogy relies on a single data point.
- It is difficult to find detailed cost, technical and project data required for analogies.
- There is a tendency that technical parameters’ adjustment factors are too subjective.
3.4.2.3. **Parametric Method**

The parametric method is a top-down approach based on the development of a statistical relationship between historical costs and the project’s physical characteristics and performance requirements. The critical point in making parametric cost estimates is that the attributes used should be cost drivers of the project. The underlying assumption of this method is that the factors that affected cost in past projects will continue to affect costs in a new project. This method is applicable when little is known about the project apart from some key characteristics.

The main difficulty in applying the parametric method is that it poses a need for sufficient statistical data about other projects, which may be difficult to obtain. Unlike analogy, parametric estimation requires data from a substantial range of projects. Confidence in a parametric estimate’s result depends on how valid the relationships are between cost and performance characteristics, which is interrelated with the amount and quality of data available about the projects. The applicability is high mostly in the early stages of a project, when the design is not well specified.

Among the several advantages to parametric cost estimating are its (GAO, 2009, p. 115):

- **Versatility:** Can be easily modified to answer what-if questions about design changes.
- **Sensitivity:** By altering the input parameters and recording the resulting changes.
- **Statistical output:** It involves objective measures of validity and a calculated standard error. This information can be used to provide a confidence level for the estimate.

Disadvantages to parametric estimating include (GAO, 2009):

- **Database requirements:** The underlying database must be consistent and reliable.
- **Black-box syndrome:** Without understanding of the process, the analyst plugs in numbers and unquestioningly accepts the result, which increases the estimate’s risk.
- **Currency:** CERs must represent the state of the art;

<table>
<thead>
<tr>
<th>Method</th>
<th>Strength</th>
<th>Weakness</th>
<th>Application</th>
</tr>
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<tbody>
<tr>
<td>Analogy</td>
<td>- Requires few data&lt;br&gt;- Based on actual data&lt;br&gt;- Reasonably quick&lt;br&gt;- Good audit trail</td>
<td>- Subjective adjustments&lt;br&gt;- Accuracy depends on similarity of items&lt;br&gt;- Difficult to assess effect of design change&lt;br&gt;- Blind to cost drivers</td>
<td>- When few data are available&lt;br&gt;- Rough-order-of-magnitude estimate&lt;br&gt;- Cross-check</td>
</tr>
<tr>
<td>Engineering build-up</td>
<td>- Easily audited&lt;br&gt;- Sensitive to labor rates&lt;br&gt;- Tracks vendor quotes&lt;br&gt;- Time honored</td>
<td>- Requires detailed design&lt;br&gt;- Slow and laborious&lt;br&gt;- Cumbersome</td>
<td>- Production estimating&lt;br&gt;- Software development&lt;br&gt;- Negotiations</td>
</tr>
<tr>
<td>Parametric</td>
<td>- Reasonably quick&lt;br&gt;- Encourages discipline&lt;br&gt;- Good audit trail&lt;br&gt;- Objective, little bias&lt;br&gt;- Cost driver visibility&lt;br&gt;- Incorporates real-world effects (funding, technical, risk)</td>
<td>- Lacks detail&lt;br&gt;- Model investment&lt;br&gt;- Cultural barriers&lt;br&gt;- Need to understand model’s behavior</td>
<td>- Budgetary estimates&lt;br&gt;- Design-to-cost trade studies&lt;br&gt;- Cross-check&lt;br&gt;- Baseline estimate&lt;br&gt;- Cost goal allocations</td>
</tr>
</tbody>
</table>

*Figure 18: The three main cost estimation methods compared (GAO, 2009)*
In practice, a combination of the three methods is used to arrive at an estimation of the cost and adapt it in the different project phases. The first rough estimation of how much a project will cost may be based on experts’ opinion, if an estimate can be derived no other way. In the initiation phase, when little is known about the project’s scope analogy is used. Only a few elements of the project that are certain can already be costed using the build-up method. Adjustments are based on those project information available, physical and performance characteristics and the contract type.

As we move forward, towards the tender phase and the scope of the work is gradually becoming more precise, the build-up method is used for the vast majority of the costs to be calculated. In this phase a more complete Work Breakdown Structure can be determined. For the rest of the parts some analogies still need to be drawn. Parametric techniques can complement the cost estimation produced in those initial stages of a project. Results must be checked for accuracy, double-counting and omissions and validated with cross-checks and independent cost experts. Lastly, it is important to notice that all methods are an input either for a deterministic or a probabilistic calculation of cost.

### 3.4.3. Deterministic and Probabilistic Approach

Deterministic methods treat the input parameters as constants during cost estimation, providing no variance in the cost inputs as a measure of uncertainty. In practice, a deterministic method consists of measures of units of items multiplied by known unit costs or factors. Thus, the deterministic method does not capture the variations during construction. This is an assumption difficult to prove in reality, as in almost every project the scope materialized differs from the one conceptualized. Agencies are currently shifting from a deterministic to a probabilistic approach in order to account for uncertainty and achieve more realistic estimates (Clemons, 2011).

Probabilistic analysis treats all input parameters as variables that change according to an assigned probability distribution function. The probability distribution predicts the likely behavior of an input parameter over a range of potential input parameter values (Nicholls, A., 2009, p. 55). Thus, it yields a more comprehensive estimate than deterministic analysis by providing a range of likely construction costs. In practice, probabilistic methods involve simple or complex modeling based on inferred or statistical relationships between costs and technical parameters. The cost estimating relationships are often somewhat subject to conjecture (DOE, 2004). An extensive cost reference database is of importance for the outcome of the estimation. Thus, the application of probabilistic methods still remains a challenge.

![Figure 19: A point estimate probability distribution driven by WBS distributions (GAO, 2009)](image-url)
To cope with costs that may result from unforeseen conditions and/or uncertainties an amount is included in the cost estimate, contingency. Long-term, complex projects need to have contingency funds because it is unreasonable to expect that a project will not encounter problems (GAO, 2009, p.22). When problems occur project managers need ready access to funding in order to resolve them without adversely affecting project’s execution, for example by extending the schedule. The level of contingency for a project can be chosen by performing a risk analysis to determine the probability of achieving the point estimate of the cost. The amount of risk is quantified through a Monte Carlo simulation and portrayed in a cumulative probability distribution, an S curve (Nicholls, 2009, p.26).

![Cumulative Probability Distribution](image)

*Figure 20: A cumulative probability distribution or S curve (GAO, 2009)*

An example of how contingency is chosen is given in Figure 20: the contract is awarded for $907.900 but the project is funded at $1,096,000. The difference of $188,000 is the contingency reserve at 70% confidence level. This means there is only 30% chance the project needs additional funding, given the risk analysis at that time. How much contingency reserve should be allocated to a project beyond the level of 50% depends on the cost growth that a client is willing to risk. Project cost estimates should be budgeted to at least a 50% level, but higher levels e.g. 80% are common practice (Young, J., 2010). A simple example can substantiate this practice. If based on experience you have ‘calculated’ that it takes an average of 1.5 hours to get to the airport and thus you decide to leave 1.5 hours before the flight, then you will miss your plane ~ 50% of the time, which is of course an unacceptable risk.
3.5. Summary of the Chapter

Infrastructure Projects
- Public infrastructure involves complex, long-term, one-off projects that contradict the standardization of the processes in all stages of the life-cycle.
- Public infrastructure pulls high levels of resources from the economy, attracts public attention and involves multiple stakeholders with diverse interests.

Procurement Processes
- European procurement is regulated by Directive 2004/18/EC, which provides that the award mechanism should be either the Lowest Price or the Economically Most Advantageous Tender.
- The EMAT does not imply that every award criterion should be economic. “Secondary” criteria that are linked to the subject of the public contract are used together with price.
- The dominant version of the EMAT in the Netherlands is based on a price correction system.
- The price correction system expresses the added value of the bids in fictitious monetary terms to be subtracted from the price and awards the bid to the lowest corrected price.
- The concept of Abnormally Low Tenders is regulated in the EU Directives but not defined.
- In the national legislation of the 27 EU members absolute and relative systems for the identification of ALTs can be distinguished.
- Absolute standards examine the given tender per se, while relative standards correlate the tender to the other tenders received.

Forms of Collaboration between Client and Contractor
- In traditional Bid-Build contracts the client provides the design and supervises the project execution, which requires expertise and staff capacity.
- In integrated contracts the client develops functional requirements and the contractor is responsible for the design, construction and in cases maintenance, operation and financing.
- The reason for the integration of project stages is that contractors are expected to develop innovative solutions and contribute to the early project delivery at a lower cost.
- Linking design and construction in a contract makes these activities a ‘black box’ for the client, which may cause a loss of the client’s expertise.
- The collaboration between client and contractor has the characteristics of a principal-agent relationship, in which the P (client) engages the A (contractor) to take actions on his behalf.
- The fundamentals of the agency problem stem from the misalignment of the objectives of the principal and the agent and the asymmetry of information between the two parties.
- Cost overruns in infrastructure are mainly a problem of risk-negligence and lack of accountability, leading in risky projects that may be economically unviable in the agreed form.
- Integrated contracts enhance the information asymmetry during tendering as the client evaluates bids based on a reference design that differs from the design and scope of the bids.
Differences in the scope result in deviations in the estimated project costs during tendering.

Both the client and the contractor aim for the lowest cost of a project.

Contractors aim to lower project costs to win the contract and to maximize the profit margin.

Clients aim for low offers because they have to deal with budget restrictions.

Choosing a fallacious low bidder increases the risk of the contractor behaving strategically during project materialization to save costs and preserve profit.

Contractors behaving strategically may produce a lower level of quality, charge for extra costs claiming that certain tasks fall outside the contract specification or renegotiate the contract.

Information asymmetry facilitates strategic behavior as contractors, unlike clients, possess technically professionalized information on the tasks/elements in which costs can be saved.

**Cost Estimation**

Cost estimates have two general purposes: to assist in evaluating and selecting alternative solutions, and to support the budget process by estimating the costs that need to be incurred.

There are three main methods to estimate costs: build-up, analogy and parametric, and two approaches to determine a range of possible costs: deterministic and probabilistic.

The stage in the life cycle when the cost is estimated has an impact on the level of detail, the data introduced and thus the estimation method.

In practice, a combination of the three methods is used to arrive at an estimation of the cost.

The build-up method sums the detailed estimates done at lower levels of the WBS and is applicable when detailed information about the project are available.

Analogy is used to estimate cost by adjusting data about the cost of similar projects and is typically used in the early stages of the life-cycle when the scope is defined in general terms.

Parametric estimation employs statistical relationships between historical costs and the project’s physical characteristics and requirements, and is applicable early in the life-cycle.

Deterministic methods treat the input parameters of cost as constants, providing no variance as a measure of uncertainty during construction.

In almost every project the scope materialized differs from the scope conceptualized.

Agencies are shifting from a deterministic to a probabilistic approach in order to account for uncertainty and achieve more realistic estimates.

Probabilistic analysis treats all input parameters as variables that change according to an assigned probability distribution function and requires an extensive cost reference database.

To cope with costs from unforeseen conditions and/or uncertainties an amount is included in the cost estimate, contingency, chosen by performing a risk analysis.
4. Legal Framework on Abnormally Low Tenders

4.1. European Case Law on Abnormally Low Tenders

Cases of ALTs have been brought to European courts numerous times, because of the absence of a common definition of ALTs and of an established method to manage them in the EU Directives. The content of the cases makes it clear that there are four distinct questions to be addressed. The first is whether there is a duty for the client to investigate ALTs. The second question is concerned with the procedure that should be followed before rejecting ALTs. The third is whether it is permissible to use an automatic formula to identify ALTs. Still, the most essential question concerns what an ALT is.

Instead of reviewing each case separately, the analysis is structured based on the questions listed above. The aim is to examine whether the rulings of courts in different cases converge or diverge on the questions set. The cases that went to court can be categorized in two groups, namely the rejection and the non-rejection cases. The rejection cases involve the exclusion of a very low tender and are brought to court by the tenderer that was excluded. The non-rejection are cases where contractors that were not awarded the bid claim that the winning bid should have been considered to be abnormally low and thus should have been excluded. The reason why this differentiation is essential is to examine if it has an influence on the argumentation of the court.

4.1.1. Is there a duty for the contracting authority to investigate?

In case law, the argumentation of the court partly builds on the ruling of previous similar cases. However, some controversies have been encountered in the approach of the European Court of Justice (ECJ) about whether there is a duty for the client to investigate ALTs. This can be attributed partly on the differentiation between rejection and non-rejection cases. Mostly, it is caused by an evolution on the perception about how to treat ALTs efficiently.

Initially, we will refer to two non-rejection cases where the claimant was an unsuccessful bidder, namely the Morrison¹ and Varney² cases (Appendix D). In both cases, a bidder claimed that the client had a duty to investigate if the winning bid was abnormally low, but failed to carry out the necessary investigations. The claimants’ arguments were rejected, as it can be seen in article 17 of the Morrison case and article 157 of the Varney case. According to Giffin (2010, p.7), in the Morrison case the judge relied upon the word “shall” used in article 55 of the EU Directive and claimed that “it seems seriously arguable that a contracting authority does come under a duty to investigate”.

A rejection case of special interest is the Renco³ case, where the claimant was a bidder that was excluded because of submitting an ALT. The bidder objected to the rejection and went to court, where his arguments were turned down. In the decision it seems that there is some sort of duty to investigate for the contracting authority (Appendix D). In particular, the court stated in article 76 that the contracting authority does not need to check each price quoted in each tender, but it must examine those tenders which are considered to be suspect. Interestingly, the decision of the court was identical to the decision in a non-rejection case, namely the PC Ware⁴ case (Appendix D).

¹ Case EWHC 487, Morrison Facilities Services Ltd v Norwich CC [2010] (CH), Article 17, Available at: http://www.casetrack.com/ct4plc.nsf/items/4-502-7238
⁴ Case T-121/08, PC Ware Information Technologies BV v Commission [2010], Article 72, Available at: http://curia.europa.eu/juris/document/document.jsf?text=&docid=804866&pageindex=0&doclang=EN&mode=lst&dir=&occ=first&part=1&cid=3762905
The most recent case was Slovensko⁶ in which, after a bid was rejected as abnormally low by the administrative appeal body, the bidder appealed to the Supreme Court of the Slovak Republic. The Supreme Court due to concerns as to whether this decision may had breached the principles of non-discrimination and transparency, decided to refer to the ECJ. The court’s judgement in article 45 expanded on the role of the national law arguing that article 55 actually requires that national law mandates investigation of ALTs, by asking for explanations of the bid in written.

The ruling of the ECJ on the Slovensko case is of decisive importance since it is the most recent one, but also due to the way it has been interpreted. Mc Gowan (2012) notices that the court’s judgement emphasized that the EU’s legislature, in enacting article 55 of Directive 2004/18/EC, intended to require contracting authorities to examine ALTs. Moreover he comments that the court’s view that clients are obliged to investigate ALTs, is the most notable and significant aspect of the judgment, because statements in previous cases had only suggested that such an obligation may exist.

The ruling on the Slovensko case is very recent and thus there is no subsequent case of an ALT on the ECJ to act as an interpretation. Nevertheless, in the absence of a definition of what constitutes an ALT, it seems doubtful that there could be an obligation for the client to investigate. Relying solely on the interpretation of Mc Gowan on the ruling of the Slovensko case in order to cope with a controversial issue as the client’s potential duty to investigate ALTs would not be sound. Further investigation is needed and thus the matter will be questioned in the interviews with legal experts.

Lastly, a comparative view of the ECJ rulings in rejection versus non-rejection cases is of interest. It seems there is a tendency in the rulings of non-rejection cases to indicate that there is no duty to investigate tenders, while in rejection cases some sort of duty for clients to investigate is often described. Specifically, in two out of three non-rejection cases it is explicitly stated that there is no duty for investigation. Conversely, in four out of five rejection cases some sort of duty is referred. Such a tendency could be attributed to the courts being more in favour of the client’s side to avoid lengthy legal proceedings delaying the execution of projects, which are aimed to improve social well being. Because in terms of this section a limited number of cases on court have been examined such a tendency cannot be generalized.

4.1.2. What is the procedure to be followed before rejecting a tender as abnormally low?

The case of Impresa Lombardini SpA⁷ is a milestone for the procedure to be followed before rejecting ALTs (Appendix D). The ruling of the ECJ was that the potential exclusion of bids as abnormally low should not be automatic. The bidder, as stated by the court, should have the opportunity to give an effective explanation of his bid. Moreover, in article 53 it is clarified that the tenderer should be made aware of the precise points about his bid which gave rise to questions in the mind of the contracting authority. The process was described in article 55 as inter partes examination, suggesting that some sort of continuing dialogue may be necessary in some cases (Graells, 2011, p. 2).

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⁶ Case C-599/10, SAG ELV Slovensko a.s. and others v Úrad pre verejné, Article 45, Available at: http://curia.europa.eu/juris/document/document.jsf?text=&docid=121164&pageIndex=0&docang=EN&mode=lst&dir=&occ=first&part=1&cid=3766582

The approach followed in the Lombardini case was imprinted later on in the article 55 of the existing EU Directive (Graells, A.S., 2011). In the Slovensko case the court clarified that when investigating bids that may be abnormally low and exchanging views with the bidder, contracting authorities do not have a completely free hand regarding the relevant factors to take into account (Mc. Gowan, 2012). Although the list of factors set out in article 55 is not exhaustive it is also not purely indicative.

### 4.1.3. Are automatic formulae permissible?

An issue that has not attracted much attention but is significant for this research is whether applying an automatic formula to identify ALTs is permissible from a legal perspective. In article 67 of Lombardini case the ECJ ruled that this was a matter for the member states to decide on. However, according to the ruling in Lombardini it was considered to be acceptable to operate a system under which there is an “anomaly threshold” of a certain percentage of the mean discount offered by tenderers from a pre-set base price (Giffin, 2010, p. 3). Again, the exclusion of bids should not be automatic, but the bidder should have an opportunity to give an explanation on his bid in written.

The line of reasoning in permitting the use of automatic formulas was that all the bidders were in the same position as they could not know in advance what the average price tendered would be and thus what level of pricing would come under scrutiny as abnormally low. Thus, it is imperative that bidders know beforehand what system is applied to avoid a breach of the transparency principle. In conclusion, an automatic formula can be used only to identify tenders that are suspicious of being abnormally low and for which investigation is needed. One point that remains unclear is whether it is sufficient to prescribe the formula on the tender documents or it is necessary to set in national law. In order to clarify this, a question was formulated in the interviews conducted with legal experts.

**Dutch Case Law**

Because the rulings of courts are in Dutch, an extensive research on the Dutch case law was not possible. A very recent case where the client used an automatic formula to identify ALTs was reviewed through the publication of PIANOo. In this judgement it is provided that the contracting agency has to motivate its decision to reject an ALT, based on the explanation provided by the bidder and not based on the thresholds included in the formula. This decision is in accordance with the ruling of the Lombardini case discussed above. Because of the language barrier no other cases on the Dutch courts are presented, since the translations of the rulings proved not to be accurate enough for a sound analysis.

### 4.1.4. What is abnormally low?

A critical point in the pursuit of addressing the problem of identifying ALTs is to determine which concepts among those trying to describe the term ‘abnormally low’ best stand in court. An important detail to bear in mind is that although the term ‘abnormally low’ seems to refer only to the price of the tender this is not true. For instance, in articles 29 & 30 of the Belfast case the number of hours’ work necessary to provide the service were considered abnormally low, even though the bottom line price was not (Appendix D).

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In the decisions of the European Court of Justice and the Court of First Instance various concepts can be encountered that intend to describe an ALT.

- Whether the bid is “genuine” (Amey LG\textsuperscript{10} and Lombardini)
- Whether it is “genuine and viable” or “sound and viable” (SECAP\textsuperscript{11}).
- Whether it is “reliable and serious” (Renco SpA).
- Whether it is “serious” (PC-Ware).

In article 20 of the Amey LG case, the judge argued that not all of the aforementioned concepts are of the same validity in legal terms. In particular, he claimed that reliability, viability and soundness are objective concepts, whereas seriousness and genuineness have the potential to be subjective. In articles 6 of the decision it is stated that the rejected bid involved unacceptable financial and operational risks and could not be considered economically sustainable (Appendix D). Moreover, in article 42 it was stated that even though the term genuine was incorrectly used to describe the tender, this could not undermine the conclusion that the tender involved unacceptable risks and was not economically sustainable. In other words, even if a tender is genuine the client still has to decide if the performance tendered is economically sustainable (Golden, 2012, p. 17).

As Giffin, (2010) aptly observes a question that rises is whether economic sustainability is to be looked at from the perspective of the contractor or that of the contracting authority. From the contractor’s point of view the economic sustainability of a bid is related to the margin for profit. Conversely, from the client’s point of view it concerns whether the tender will result in a situation where complying with the contract conditions and project requirements is extremely difficult. As it noticed by Graells (2011, p. 3) the justification for the empowerment of clients to reject ALTs seems to be that they should not award the contract under circumstances where there is a reasonable risk of non-performance of the contract. Thus, in the view of this research, the economic sustainability of tenders should be examined from what is described as the client’s perspective.

\textsuperscript{10} Case CA114/12, Amey LG Ltd v Scottish Ministers, Articles 22, 40, 42, Available at: \url{http://www.scotcourts.gov.uk/opinions/2012CSOH181.html}
\textsuperscript{11} Case C-147/06, SECAP SpA v Comune di Torino, Articles 24, 26, 29, Available at: \url{http://curia.europa.eu/juris/document/document.jsf?text=&docid=67371&pageIndex=0&doclang=en&mode=lst&dir=&occ=first&part=1&cid=3785185}
4.2. National Legislation of the 27 EU Members

In the previous chapter it became clear that the EU legal framework does not allow the automatic rejection of tenders as abnormally low without asking for explanation. The lack of a common definition of ALTs in the EU Directive means there are no unified standards to identify tenders for which explanations should be asked. However, on a national level several EU members have legally established standards to identify ALTs. In addition, the article on ALTs in the initial proposal for a new EU Directive involved mathematical standards. Those two matters are discussed in this chapter, so as to obtain an insight on the process and/or standards that can be used to identify ALTs.

As it can be noticed, eight out of the twenty seven EU members have legally established mathematical standards for the identification of ALTs. There is a slight tendency towards the use of relative standards i.e. standards comparing the lowest bid with mean of the bids. In some counties, relative standards are used as an indicator together with absolute standards, which are based on the cost estimation made by the client. In certain cases, there is a prerequisite for a minimum number of bids for the standards to be applicable. In all those cases relative standards are used. Thus, the prerequisite for a minimum number of bids can be related with the trustworthiness of their mean. Lastly, in some of the cases where relative standards are applied, the highest and the lowest bids are excluded from the calculation of the mean if a certain number of bids is received.

The thresholds that are used in the various standards vary significantly. The table below, presents the average and the bandwidth of the thresholds used with relative and absolute standards. The case of Slovenia is excluded because it has evidently integrated the standards in the proposal for a new Directive, which were arbitrary as it will be argued in the next section. The conclusion that Slovenia copied the proposal is based on the fact that the standards are identical to the ones in the proposal and the only that examine the deviation from the 2\textsuperscript{nd} lowest tender. Also, in Slovenia a new procurement act was put into force in February 2013, almost two years after the first version of the proposal was published. The information obtained through this section is not further discussed here as it formulates the background for several questions that were asked during the interviews.

<table>
<thead>
<tr>
<th>Type of Standards</th>
<th>Mean of the thresholds</th>
<th>Bandwidth of the thresholds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative</td>
<td>21.25 %</td>
<td>(15 - 30) %</td>
</tr>
<tr>
<td>Absolute</td>
<td>24 %</td>
<td>(10 - 40) %</td>
</tr>
</tbody>
</table>

* The source for the information included in Figure (22), are the official legal documents of the EU members as published online. The standards presented in the table are translated - where necessary - in an unofficial way. Thus, the preciseness of the terminology cannot be guaranteed. The entire articles of the National legislation on ALTs can be encountered in Appendix (F).

*Figure 21: The mean and bandwidth of the thresholds in the national law of the 27 EU members*
<table>
<thead>
<tr>
<th>Country</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>-</td>
</tr>
<tr>
<td>Belgium</td>
<td>▪ 15% lower than the mean of the bids if at least 4 bids are submitted, while the mean refers to the mean of all the bids apart from the highest and the lowest if the bids are equal or more than 7</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>▪ 30% lower than the mean of the other bids</td>
</tr>
<tr>
<td>Cyprus</td>
<td>-</td>
</tr>
<tr>
<td>Czech Rep.</td>
<td>-</td>
</tr>
<tr>
<td>Denmark</td>
<td>-</td>
</tr>
<tr>
<td>Estonia</td>
<td>-</td>
</tr>
<tr>
<td>Finland</td>
<td>-</td>
</tr>
<tr>
<td>France</td>
<td>-</td>
</tr>
<tr>
<td>Germany</td>
<td>-</td>
</tr>
<tr>
<td>Greece</td>
<td>-</td>
</tr>
<tr>
<td>Hungary</td>
<td>▪ 20% lower than the available funds</td>
</tr>
<tr>
<td>Ireland (UK)</td>
<td>-</td>
</tr>
<tr>
<td>Italy</td>
<td>▪ points scored in price and quality are both more than 4/5 of the corresponding maximum points</td>
</tr>
<tr>
<td>Latvia</td>
<td>-</td>
</tr>
<tr>
<td>Lithuania</td>
<td>-</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>-</td>
</tr>
<tr>
<td>Malta</td>
<td>-</td>
</tr>
<tr>
<td>Netherlands</td>
<td>-</td>
</tr>
<tr>
<td>Poland</td>
<td>-</td>
</tr>
<tr>
<td>Portugal</td>
<td>▪ 40% lower than the base price in the specifications</td>
</tr>
<tr>
<td>Romania</td>
<td>▪ 30% lower than the contract value if bids are less than 5</td>
</tr>
<tr>
<td></td>
<td>▪ 15% lower than the mean of the bids excluding the lowest and highest bid if bids are more than 5</td>
</tr>
<tr>
<td>Slovakia</td>
<td>-</td>
</tr>
<tr>
<td>Slovenia</td>
<td>▪ 50% lower than the mean of the bids and 20% lower than the 2nd lowest bid if at least 4 bids are submitted</td>
</tr>
<tr>
<td>Spain</td>
<td>▪ 25% lower than the base price of the contract if 1 bid received</td>
</tr>
<tr>
<td></td>
<td>▪ 20% lower than the second bid if 2 bids received</td>
</tr>
<tr>
<td></td>
<td>▪ 10% lower than the mean of all the bids, if 3 bids received, but if the highest bid is 10% higher than the mean of all bids it should be excluded from the calculation of the mean, in all cases lower than 25% is a threshold</td>
</tr>
<tr>
<td></td>
<td>▪ 10% lower than the mean of all the bids if 4 or more bids received, but all bids that are higher than 10% from the mean of all bids should be excluded from the calculation of the mean and if the remaining bids are less than 4 then one of the above three rules should be applied</td>
</tr>
<tr>
<td></td>
<td>▪ In exceptional cases the contracting authority can reduce the thresholds by 1/3 to adjust to market conditions</td>
</tr>
<tr>
<td>Sweden</td>
<td>-</td>
</tr>
</tbody>
</table>

*Figure 22: Overview of the National legislations of the 27 EU members on ALTs (Appendix F)*
4.3. Proposal for a new European Directive on Public Procurement

Recently, the European Commission has been concerned with an upcoming revision of the legislation regarding public procurement. At the time this research is conducted the proposal for a new directive is finalized in order to be distributed to the Member States for evaluation and approval. The latest version of the proposal was published in November 2012. A previous version of the proposal was published in December 2011. The final version of the proposal is expected to be distributed to the Member States within 2013. Afterwards, a time period of 18 months is needed before the new EU Directive will be officially established by the EU parliament, the EU commission and the Council, which will take place within 2015 based on this timeframe.

Abnormally low tenders have evidently attracted the attention of the EU commission as the two versions of the proposal are very different with respect to ALTs. In the 2012 version, in recital 44a, ALTs are described as “tenders that might be based on technically, economically or legally unsound assumptions or practices”. It is added that “where the tenderer cannot provide sufficient explanation, the contracting authority should be entitled to reject the tender. Rejection should be mandatory when the client has established that the abnormally low price charged results from non-compliance with mandatory Union legislation in the fields of social, labour or environmental law or the corresponding international law provisions”.

In the 2011 version, in recital 42, the description of ALTs was the same apart from an extra phrase which suggested that “in order to prevent possible disadvantages during contract performance, contracting authorities should be obliged to ask for an explanation of the price charged where a tender significantly undercut the prices of other tenderers”. It appears that in the process of negotiating the final version of the proposal, the obligation of contracting authorities to investigate ALTs was rejected. Instead, the EU commission decided that whether there is a duty for contracting authorities to investigate ALTs should be a matter for the Member States to decide on.

In particular, the 2012 version, in article 69, provides that “where tenders appear to be abnormally low in relation to the works, supplies or services, the contracting authority may require, or be obliged by a Member State to [...] require, economic operators to explain the price or costs proposed in the tender”...“The contracting authority shall assess the information provided by consulting the tenderer. It may only reject the tender where the evidence supplied does not satisfactorily account for the low level of price or costs charged...” The main difference in the 2011 version is that the article 69 proposed mathematical standards for the identification of ALTs. Specifically, it stated that:

“Contracting authorities shall require economic operators to explain the price or costs charged, where all of the following conditions are fulfilled:

(a) the price or cost charged is more than 50 % lower than the average price or costs of the remaining tenders
(b) the price or cost charged is more than 20 % lower than the price or costs of the second lowest tender;
(c) at least five tenders have been submitted.

Where tenders appear to be abnormally low for other reasons, contracting authorities may also request such explanation... The contracting authority shall verify the information provided by consulting the tenderer. It may only reject the tender where the evidence does not justify the low level of price or costs charged...”
Even though the provision of quantitative standards for ALTS has been rejected in the process of negotiating the proposal, it was essential to understand how those standards were set. Thus, an interview was conducted with the Head of the Unit of the EU commission responsible to prepare the proposal for a new Directive, Mr. P. Stamatopoulos (Appendix E). In the interview, it was indicated that the standards proposed were arbitrary and they were aimed to formulate a base for negotiation on the potential of setting quantitative standards.

This can be verified by reviewing the national Legislation of the Member States. The standards in the proposal allow for a higher deviation of the lowest tender, than any standards encountered in national legislation. Choosing to set under negotiation standards that “encapsulate” the ones currently applied is logical, as the proposal does not contradict with any of the national legislations. There is one exception, Slovenia that integrated in the national procurement act the standards proposed by the EU commission in 2011, as argued in the previous section.

Even though the standards in the proposal cannot be trusted in quantitative terms because they appear to be arbitrary, there are three things to focus on. First, the EU commission decided to make use of relative standards for the identification of ALTs. Second, the deviation from the 2nd lowest standard is considered to be an indicator. Third, a minimum number of bids were prerequired, which is interrelated with the use of relative standards.

The view of the EU commission, as expressed by Mr. Stamatopoulos during the interview, is that the concept of ALTs is relative and has to do with the other bids. Moreover, establishing and using relative standards is considered to be less complex. The alternative of relying on some short of cost estimation by the contracting authority is difficult in the view of the EU commission. The accuracy of the cost estimation of the contracting authority is considered to be doubtful. This does not refer only to the ability of the contracting authority to prepare accurate estimates. It is also related to phenomena of strategic adjustments on the cost estimation made by the client in order to influence the budget allocated to a project.

Another point of discussion during the interview in the EU commission was about the meaning of the word “price” for which the deviation is calculated. The reason is that in the context of the LP award mechanism the end price of an offer refers only to the real price in Euros, while in the EMAT mechanism the end price involves also fictitious Euros being subtracted from the real price. It was made clear, that the proposal of the EU commission refers to the end price which in the case of the EMAT mechanism involves also fictitious Euros or any other quantification of quality. The requirement for a certain deviation from the 2nd lowest bid and the standards proposed by the EU commission as a whole, are a point of departure for many of the questions asked in the interviews.
4.4. Summary of the Chapter

**European Case Law on ALTs**
- There is some controversy in the approach of the European Court of Justice in cases regarding whether there is a duty for the client to investigate ALTs.
- In the absence of a definition of what constitutes an ALT in the EU Directive, it seems doubtful that the client could be under a duty to investigate.
- The exclusion of bids as abnormally low cannot be automatic. The client first needs to ask the contractor for explanation on precise points of the bid that raise suspicions.
- The contractor needs to provide the explanation in written and within due time.
- The use of automatic formulas (mathematical standards) for the identification of ALTs is permissible, but the tenders cannot be excluded without first asking for explanation.
- The term “abnormally low” does not refer only to the price offered in the tender but it may refer also to qualitative aspects of the bid if the EMAT mechanism is applied.
- In legal terms ALTs should be related with objective concepts as the economic sustainability of bids and not the seriousness or genuineness of bids that has the potential to be subjective.
- From a client’s perspective, ALTs are linked with the risk of the project not being delivered according to the contract, in the way described by the bid and for the whole contract duration.

**National Legislation of the 27 EU Members**
- In total eight countries have legally established standards for the identification of ALTs that are different in between.
- Three approaches can be encountered: use of relative standards, use of absolute standards, and use of both standards depending on the number of bids.
- Relative standards examine the deviation of a bid from the mean of the bids and absolute standards examine the deviation from the cost estimation of the client.
- A minimum number of bids is often required for the applicability of relative standards.
- The highest and lowest tenders are often excluded from the calculation of the mean if the number of bids is sufficient.

**Proposal for a new European Directive on Public Procurement**
- In the process of negotiating the final version of the proposal, the obligation of contracting authorities to investigate ALTs included in the initial version was rejected.
- In the process of negotiating the final version of the proposal, the use of mathematical standards for the identification of ALTs included in the initial version was rejected.
- The standards set under negotiation by the EU commission examined the deviation from the mean of the bids and from the 2nd lowest bid, and prerrequied a minimum number of bids.
5. Procurement of Infrastructure Projects in the Netherlands

5.1. Dutch Procurement Act

The Dutch procurement regulations were revised by the procurement act that took effect in April 2013 and has been published since November 2012. A point of interest in the new act with respect to this thesis is section § 2.3.8.4 entitled as Award Criteria. It provides that the contracting authorities shall apply the EMAT mechanism or otherwise they need to substantiate in the tender documents why the lowest price criterion has been chosen. The next section, § 2.3.8.5 which is about ALTs is identical to the previous Dutch procurement act and to the existing EU Directive (Appendix C).

The new Dutch procurement act does not take into account the previously discussed proposal for the upcoming revision of the EU directive. As it is indicated by Pianoo (see References), this will take place later on by amending the public procurement act. In the meanwhile, the Dutch procurement act will be evaluated and revised in a 2-year time period, thus on April 2015. Those practical details indicate two things. First, the legal framework on public procurement is currently under evolution. Second, the Netherlands has not yet acted upon the issue of ALTs, which has captured the attention of the EU commission in the process of revising the procurement directive.

5.2. Integrated Contracts in the Netherlands

5.2.1. Types of Integrated Contracts

Until the late 1990s Rijkswaterstaat, the executive agency of the Dutch Ministry of Infrastructure and the Environment, was working out the desired solution in detail in a ‘RAW-bestek’: a specification including a detailed technical design with underlying preliminary calculation of materials needed and construction time (Lenferink, S. et al., 2013). Based on this estimate, contractors could calculate their bids and the lowest bidder would be awarded the construction contract. After completing construction, maintenance was performed by public road districts or contracted out in separate maintenance contracts, which were also specified in detail.

The first type of more inclusive contracts that were set into practice in the Netherlands are known as Design and Construct (D&C), the Dutch equivalent for Design and Build (DB). Instead of providing an elaborated design in detail, in a D&C contract the contracting authority only requests certain outputs to be delivered, based on the general demands and wishes of involved public parties (Lenferink, S. et al. 2013). In 2008, D&C contracts became the standard form of contracting within Rijkswaterstaat. The next step in the integration of stages in infrastructure projects was taken by introducing Design-Build-Finance-Maintain (DBFM) contracts in which design and construction tasks are combined with performance maintenance over a longer contract period. Those contracts are currently the standard for complex projects in the Netherlands and are increasingly applied.

A specialty in the application of DBFM contracts in the Netherlands is that maintenance is divided from operation. Maintenance can be distributed to market parties, whereas operation, the exploitation through network management, currently remains a strictly public responsibility (Chao-Duivis, 2011). Thus, private parties that fund the infrastructure cannot generate income out of the network management, for instance through tolling. Instead, they are paid back their investments by the contracting authority on the basis of their performance, by receiving availability payments during operation. As it can be seen in Figure 24, this creates a totally different cash-flow scheme in comparison to a regular D&C contract.
In practice, contracting parties in a DBFM establish a Special Purpose Company (SPC) for the specific project. The SPC constitutes a legal entity that connects the main contractors with external financiers so as to distribute risks, liabilities and cash flows. Banks and other financial institutions finance the project by providing senior debt. The contractors provide equity while they are shareholders on the SPC, thereby taking part of the entrepreneurial risk. The result as Lenferink, S. et al. (p.620, 2013) notice is that the Finance component in Dutch integrated contracts works as an incentive to guarantee actors’ performance.

The activities of the consortium partners in DBFM contracts do not fundamentally change. The awarded DBFM contract is split up in separate parts for construction and maintenance, and distributed to those partners formulating the consortia that are specialized in each activity. Thus, the construction stage in a Dutch DBFM project remains fairly similar to traditional contracted projects (Lenferink, S. et al., 2013). It is the design and procurement stage in which optimizations are mainly generated, both in DBFM and D&C contracts. Consequently, procurement plays an essential role in the setup of integrated contracts as it is closely linked with design activities.
5.2.2. Procurement of Integrated Contracts

The aim of contracting authorities during tendering is to achieve value for money in their projects. In traditional contracts where the design is already known, the way to achieve value for money is by minimizing the cost of materializing the project. Thus, the lowest price award mechanism is the most appropriate approach for traditional contracts. In integrated contracts where the design is put into tender time, quality, innovativeness of the proposed solution, the work method etc. need to be evaluated next to the price submitted. Consequently, the Economically Most Advantageous Tender that examines several criteria to award a bid is the most adequate tender mechanism.

The contracting authority in order to achieve higher value for money has the freedom to specify the solution through the use of context-sensitive award criteria. Examples of such criteria are those applied in the A12 motorway project, in which preventing traffic and environmental nuisance during construction and maintenance was an award criterion (Lenferink, S. et al., 2013). The drawback of such criteria used to evaluate the qualitative aspects of a tender is the difficulty to quantify them, in order to measure the contractors’ performance and award the contract.

In many cases, the difficulties clients are facing in quantifying the qualitative criteria of the EMAT lead them to attribute very similar scores to all bidders for those aspects. As it is indicated in the preliminary interviews, clients often organize procurement processes in which the EMAT mechanism is applied in a way that the price criterion is still dominant. Another way to achieve this is by attributing a disproportionally high weight to the price criterion. In tenders where the price criterion is dominant the rating of the bids almost reflects the rating of the bid prices (Figures 26 & 27). In conclusion, the way in which the EMAT mechanism is applied is not unified.
The concept of value for money is also the indicator about whether to materialize a project as a D&C or a DBFM. The quantification of value for money is performed based on the establishment of a public private comparator (PPC). The PPC is used to compare the cost and corresponding risk allocation of a given project if realized fully by the government or by a private contractor. The aforementioned indicate that the allocation of risks is an important parameter in the procurement of integrated contract as most of the risks arise and need to be treated adequately at the design stage.

The risk analysis is interrelated with the tender price to be submitted. This is well described through an example given by De Ridder & Koppen (2008) who stated that “since the client did not provide adequate risk analysis, the contractors submitted their tender with a higher price to include a ‘safety buffer’ in case of unforeseen risks.” In order for the parties to exchange views on explicitly named risks during tendering, most DBFM contracts are currently being tendered with the use of the Competitive Dialogue (Chao-Duivis, 2011). In a competitive dialogue the contractual parties are exchanging views and in a way build up the tender together. Under these terms it is doubtful that a process to identify ALTs would be of any use in case of a competitive dialogue.
5.3. Cost Estimation

As discussed in the literature study, there are different methods to calculate the cost, depending on the purpose of the estimate and the stage in the lifecycle. In practise those methods are combined based on the information available. In the initiation phase, when little is known about the project scope a benchmark approach is mostly used. In numerical terms, approximately 80-90% of the costs are estimated based on analogies and parametric calculations. Only a few elements of the project that are certain can already be costed using the build-up method. Adjustments are based on those project information available, physical and performance characteristics and the contract type.

As we move towards the tender phase and the scope of the work is gradually becoming more precise, the build-up method is used for the vast majority of the costs to be calculated. In this phase a more complete WBS can be determined. For the rest of the parts some analogies and parametric relationships still need to be drawn (Figure 29). The expected accuracy of the cost estimate also varies among the project stages. The expected deviation during the initiation phase is around 40%, during the conceptual design is around 25%, but when it comes to the tender preparation the deviation is not expected to be more than 10-15%, as indicated in the preliminary interviews.

![Figure 29: Combination of cost estimation methods in the early project stages](image)

The introduction of integrated contracts has had important implications for the clients’ cost estimate during tendering. Because the detailed design is yet to be prepared not enough technical details are known in order to build up the estimate. Thus, the cost estimation needs to be done on a higher level of the work breakdown structure where the uncertainty is rather high. The development of parametric methods of cost estimation that could assist is recent. A parametric cost estimate requires a database of sufficient size, quality, and homogeneity so as to develop statistically valid relations for the cost drivers. As a result, parametric estimation of the cost is still less reliable in comparison to the build up method which is dominant in practise.

In order to do an accurate estimation of the cost it is necessary to clearly identify the scope of the project for which the calculation is done. This is the main complexity created by the introduction of integrated contracts. Prescribing functional specifications of the contract give contractors more freedom on the scope for which they estimate costs. On the other hand, the client estimates the cost based on a certain solution - a reference design - derived from previous, similar projects. The design solutions in the bids may be very different in between and also in comparison to the reference design. The result is that the cost estimates of the contractors and the client may deviate vastly.
The differences in the cost estimates of the client and the contractor during tendering go beyond the mismatches in the scope. First, clients do not take into account the market conditions in their cost estimate. Moreover, clients and contractors include different cost elements in their estimates. For instance, there are preparation works that are not part of the contract as the client is responsible for them. The cost for these works is calculated by the client, but is not part of the price that the contractor offers in his bid. Examples of such costs may be the expropriation costs for the land or the costs for excavation. In conclusion, the client needs to distinguish between contract and non-contract costs when comparing his estimate with the contractor’s estimate.

- Clients estimate the cost based on business economics, while bidders use market economics
- Clients estimate the total project cost, while bidders estimate only the contract cost
- Clients estimate the cost based on a different scope that the bidders

**Figure 30: The main differences in the cost estimation of the client and the bidder**

Furthermore, there is another level of ill-determination of the scope and thus of the cost estimated for the project. The scope defined in the tender documents either by the client or by the contractor is altered when the project is realized due to complications arising during the execution of works. The most typical example is related to the soil conditions. To sum up, the scope for which the client calculates the cost differs from the scope for which the contractor calculates the cost and both differ from the project scope in reality (Figure 31).

**Figure 31: Differences in the project scope**

To cope with differences between the projected scope and the scope in reality, probabilistic methods are used to calculate the project cost, which integrate risks on the estimate. In the Netherlands the different parties of the construction industry, involving clients, contractors, consultants, academics and users have collaborated on the development of SSK, a probabilistic method to estimate costs. In essence, it is an evolution of the system that Rijkswaterstaat developed and used to estimate costs in a unified way. It is aimed at the preparation of cost estimates during all project stages that are more comparable and transparent. For more information on the SSK2010 see Appendix (G).
5.4. Summary of the Chapter

**Dutch Procurement Act**
- Contracting authorities shall apply the EMAT mechanism or otherwise they need to substantiate in the tender documents why the lowest price criterion has been chosen.
- The Netherlands, following the upcoming revision of the EU Directive, will have to enact upon the issue of ALTs when the new Dutch procurement act will be amended.

**Integrated Contracts in the Netherlands**
- Currently, DC and DBFM are the standard forms of contracting in the Netherlands.
- The Finance component works as an incentive to guarantee actors’ performance.
- Procurement is essential in integrated contracts as it is closely linked with design activities.
- Because the design is put into tender, the qualitative aspects of bids need to be examined through the application of the EMAT award mechanism.
- The drawback of the EMAT mechanism is the difficulty to quantify the qualitative criteria and to measure the contractors’ performance.
- The difficulties clients face in quantifying the qualitative criteria of the EMAT, often lead them to attribute very similar scores to all bidders for those aspects.
- The EMAT mechanism is not applied in a unified way as often the price criterion is dominant.
- Risk allocation is an important parameter in the procurement of integrated contracts.
- Risk analysis is interrelated with the tender price to be submitted.

**Cost Estimation**
- In practice, a combination of the three methods is used to arrive at an estimation of the cost.
- In the tender phase, where a more complete WBS can be determined, the build-up method is used to calculate the vast majority of the costs.
- In integrated contracts, where the detailed design is yet to be prepared, the cost estimation needs to be done on a higher level of the WBS where the uncertainty is high.
- The scope for which clients and contractors estimate the cost during tendering is different.
- Clients estimate the total project costs, while contractors estimate only the contract costs.
- Clients, unlike contractors, do not take into account market conditions in the cost estimation.
- The scope defined during tendering is different than the scope in reality due to complications arising during execution of the works.
- To cope with differences between the projected scope and the scope in reality, probabilistic methods are used to calculate the cost, which integrate risks on the estimate (e.g. SSK2010).
6. Intermediate Findings

The current section recapitulates the findings of the research up to now, as they formulate the background for the interviews that were conducted and will be presented in the subsequent chapter. To start with, the existing EU Directive does not provide a clear definition about what constitutes an ALT in the homonymous article. The analysis of European case law indicates that the term abnormally low should be related with objective concepts such as the economic sustainability of a bid. According to the ECJ the potential exclusion of bids as abnormally low should not be automatic.

When the client identifies a tender that raises suspicions for abnormalities he is not entitled to reject the tender before asking the bidder for written explanation on precise points of the bid. However, in the cases on court there is some controversy about whether the client has a duty to investigate for suspicious tenders. Applying automatic formulas (mathematical standards) to identify suspicious tenders is permissible as far as it is described in advance to ensure transparency. Again, the exclusion of bids should not be automatic. In conclusion, any process or standards can only be oriented towards the identification of bids for which explanation shall be asked from the contractor.

Currently, 8 out of the 27 EU Members have legally established mathematical standards for the identification of ALTs. Those standards examine the deviation of the lowest tender from either the mean of the bids (relative standards) or the cost estimation of the client (absolute standards), or both. In countries that use both, the number of received bids indicates which method shall be applied. A pre-requirement for a minimum number of bids is included in almost all the cases where relative standards are involved either solely or in conjunction with absolute standards. Thus, a minimum number of bids appears to be required to ensure the trustworthiness of their mean.

Recently, the EU Commission has been concerned with the revision of the EU Directives on public procurement. The proposal for a new directive published by the EU Commission involves a revision of the article on ALTs. The initial version of the proposal prescribed, as a base for negotiation on the issue, relative standards for the detection of ALTs. The deviation from the mean of the bids and from the second lowest bid, were the indicators used and a minimum number of bids was required. In addition, an obligation for the client to investigate tenders that exceed the thresholds was described.

The latest version of the proposal does not include any mathematical standards. Instead, it focuses on the process to be followed with respect to ALTs. In this version, the Directive itself may only require the contracting authority to investigate ALTs, but it leaves margin for the national law to oblige clients to investigate. In the Dutch context, the new procurement act did not take into account the proposal for a new Directive. The current provisions about ALTs are almost identical to the existing EU Directive and thus the concept of ALTs remains ill-defined. The Netherlands, following the upcoming revision of the EU Directive, will have to enact upon the issue of ALTs when the new Dutch procurement act will be amended.

The issue of ALTs has characteristics of an accountability problem as it was indicated by a principle-agent analysis on the forms of collaboration between the client and the contractor. During tendering, agents (contractors) can make strategic adjustments on their tenders and bid below cost so as to win the contract. Contractors may also underbid accidentally due to misinterpretation of the specifications or due to miscalculations in the bid. Contracting authorities are tempted to accept low tenders as they endeavour to deliver the project at/or lower than the budget. In conclusion, the issue of what constitutes a tender that is abnormally low is sensitive.
Focal point in the agency theory is the asymmetry of information between the principal and the agent. Integrated contract forms intensify the asymmetry of information between the contractual parties during tendering. Because the design is made by the contractor, the client faces uncertainties in specifying the scope. To offer design freedom to the contractor the project is described based on functional specifications, which is a demanding task. In DBFM projects where the contract involves also the maintenance and finance of the project, the complexities in specifying the scope are higher, but the motivation of parties for good performance is stronger because of the finance part.

Procurement plays an essential role in the setup of integrated contracts as it is closely linked with design activities. Because the design is put into tender, aspects of time, quality, the construction method etc. need to be evaluated together with the price. Thus, the new Dutch procurement act requires the application of the EMAT award mechanism. The drawback of evaluating the qualitative aspects of a tender together with the price, is the difficulty to quantify them and to measure contractors’ performance. As a result, the comparative evaluation of bids is difficult.

The introduction of integrated contracts has created difficulties for the client to estimate the project cost precisely during tendering. The traditional build-up method where the total project’s cost is based on the aggregation of the cost per element is dominant in the Netherlands. Because the detailed design of the project is not known to the client during tendering, being precise in conceptualizing the scope for which the costs are estimated is hard and requires experience. Thus, examining whether the bid price offered is abnormal based on the cost estimation is difficult.

The allocation of risks is another important parameter in the procurement of integrated contracts, as most of the risks arise and need to be treated in the design stage. The risk analysis is interrelated with the tender price to be submitted. In order to cope with project risks, a probabilistic approach on estimating the cost is gradually taking precedence over the traditional deterministic calculation. In the Netherlands, the main contracting authorities use the SSK model, a probabilistic method to estimate the cost, which provides a common definition of the cost elements. However, in most cases contractors do not make use of the SSK to estimate costs.

The differences in the cost estimation made by clients and contractors go far beyond the use of SSK. Firstly, because the project is yet to be designed the scope for which the client and the contractor calculate the cost differs. Secondly, clients estimate the total project costs that include also non-contract costs (e.g. expropriation costs). Thirdly, clients calculate the cost based on business economics and do not take into account the market conditions, while contractors do. Lastly, clients do not have insight on improvements of the construction method that may be taken into account by the contractor when formulating the bid, which are based on unique project circumstances (e.g. availability of redundant materials from other projects).

The aforementioned substantiate that the evaluation of bids and the identification of ALTs is complex both in legal and in practical terms. The regulated standards to identify ALTs are based on the deviation from the cost estimation and the mean of the bids. In practise, formulating sound mathematical standards is a very demanding task. Nevertheless, establishing a standardized process to manage ALTs is essential. The complexities for the identification of ALTs discussed above are visualized below in Figure 32.
Figure 32: Visualization of the difficulties in developing mathematical standards for the identification of ALTs
7. Interviews

7.1. Introduction

The aim of conducting the interviews is twofold, to validate the intermediate findings and to complement them with additional information on the subject of the research. Consequently, the intermediate findings are used to derive the questions of the first round. Similarly, the findings of the first round constitute an input in formulating the questions of the second round (Figure 33). For instance, issues that are raised by several experts during the first round are exposed at the judgment of all the participants during the second round.

![Interview Process Diagram](image)

**Figure 33: Interview Process**

In order to investigate the subject in depth and obtain as much information as possible, the interviews in the 1st round were semi-structured, were conducted in person and lasted on average 1.5 hours. By semi-structured it is meant that a set of predefined questions was asked during the interviews and it was followed by an open discussion. Two different sets of questions were formulated for the legal and the cost experts (Appendix H). Some questions were in common for both groups, so as to grasp the different perspectives on certain issues based on the field of expertise. The questions were provided to the participants in advance.

As it was already mentioned in the Research Design an equal number of legal and cost experts were selected based on their experience in the procurement of infrastructure projects. To achieve a comprehensive view on the subject, experts on both the clients’ and the contractors’ side participated. Before the start of each interview a short introduction was made. There, it was specified that the questions were asked in the context of transportation infrastructure projects, materialized under integrated contract forms and procured with the EMAT award mechanism. In addition, it was clarified that the anonymity of the answers is preserved in the sense that the answers are not related to the participants.

- The hard copies of the answers can be available only after approval of the interviewed person, due to sensitivity of information. For details contact the author at: antonismegremis@gmail.com
In terms of this chapter the results of the two rounds of interviews with experts are analyzed. The answers of the participants as well as the vast majority of the comments and suggestions made are grouped and presented in Appendix (H). A minor part of the information provided is omitted either because it was considered as irrelevant for this research or because it was ‘sensitive’, meaning that it could indicate the respondent that made the statement. In this chapter, only the information that is relevant to the analysis is summarized in bullet points (tables 35 - 40) to facilitate understanding of the analysis.

Before proceeding with the analysis some clarifications are needed. The term ‘automatic formula’ is adopted by the literature and refers to the mathematical standards that can be used to identify ALTs. The mathematical standards that are analyzed are either relative, meaning that the deviation of the lowest bid from the mean of the bids is set as a threshold, or absolute, meaning that the threshold is the deviation from the cost estimation of the client. Lastly, the term client is used to refer to the contracting authority (agency) that invites contractors to submit their bids.

The information provided by the participants is divided in answers and comments. The comments are either statements complementary to the answers given or issues that were raised during the open discussion. This differentiation is made because the comments include information that was not explicitly requested, but was considered significant enough in the participants’ perception. Moreover, the aim of the 1st round was to answer the questions, but also to investigate for additional issues to be discussed during the 2nd round, that were mostly derived from the comments.

The legal and cost experts are further categorized based on whether they consider themselves working on the client’s, the contractor’s or both sides (Figure 34). With respect to the latter, the participants were explicitly asked in the 2nd round which side they consider themselves working on. In the analysis, when the side of the respondents is not indicated otherwise, it means that those participants express both the client and the contractor side.

<table>
<thead>
<tr>
<th>A/C</th>
<th>Answers/Comment</th>
<th>Interview Map</th>
</tr>
</thead>
<tbody>
<tr>
<td>LE</td>
<td>Legal Expert</td>
<td></td>
</tr>
<tr>
<td>CO</td>
<td>Cost Expert</td>
<td></td>
</tr>
<tr>
<td>Cli</td>
<td>Client’s Side</td>
<td></td>
</tr>
<tr>
<td>Con</td>
<td>Contractor’s Side</td>
<td></td>
</tr>
<tr>
<td>Bo</td>
<td>Both Sides</td>
<td></td>
</tr>
<tr>
<td>D.</td>
<td>Open Discussion</td>
<td></td>
</tr>
<tr>
<td>Q.1.C</td>
<td>1st Question to Cost Experts</td>
<td></td>
</tr>
<tr>
<td>Q.1.L</td>
<td>1st Question to Legal Experts</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Cost Experts</th>
<th>Legal Experts</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractors</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Contracting Authorities</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Both Sides</td>
<td>3</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Total - 1st Round</td>
<td>10</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Total - 2nd Round</td>
<td>9</td>
<td>9</td>
<td>18</td>
</tr>
</tbody>
</table>

Figure 34: Explanatory list of acronyms and interview map

7.2. First Round

The analysis of the results does not follow the order in which the interview questions were addressed by the participants. Instead, the analysis is structured based on a sequence of thematic sections, starting from the legal aspects of the problem of identifying ALTs. Then, the potential of developing mathematical standards to identify ALTs is investigated. Finally, the analysis focuses on the role of the key concepts of this research (cost estimation, integrated contracts, EMAT mechanism, etc.) on managing the problem of ALTs.
As it was concluded in section (7.1), there is some ambiguity about the legal duties of the contracting authorities regarding the investigation of ALTs. To begin with, there is absolute consensus that investigating for ALTs is not a duty but only a right of the contracting authority. The only duty that exists for clients is to investigate tenders, by asking for explanation from the contractor, before deciding on whether to reject them. The precise points of the bid that raised suspicions should be made clear by the client when asking for explanations, which need to be provided in written by the contractor and within due time.

Almost one third of the participants added that this explanation becomes part of the offer. If the explanation on the bid is legally binding during project materialization, the investigation process can prove very essential. Thus, the issue is further investigated during the 2nd round of interviews. The question, then, arises: what if the explanation provided by the contractor is not satisfactory. Again, there is unanimity that there is no duty for the contracting authority to reject the tender, but only a right. All respondents agreed that the client cannot allow the contractor to make changes in his bid. Interestingly, half the participants added that in practice changes are allowed to a certain extent, as far as competition is not harmed and the changes do not result in a 'new' bid. In conclusion, changes in the bid cannot be of such an extent to prevent a tender from being abnormally low.

Next, the legal experts confirmed the outcome of section (7.3) that mathematical standards are permissible and further clarified that they can be established either in national law or in the tender documents. In fact, three respondents expressing the client’s side suggested to set mathematical standards in the tender documents or to set general standards in the national law provided that their use would not be binding. Another respondent suggested establishing the standards in the Gids Proportionaliteit (Proportionality Guide). Because this point raised several comments and diverse suggestions it is discussed explicitly in the 2nd round. Lastly, all experts agreed that if standards are set in the tender documents they should be included in the award phase documents. This is the part of the process where the bid is evaluated and not the bidder.

The findings of the 8th chapter, which presented the regulated standards on ALTs, were used to formulate questions regarding some “technical details” on mathematical standards. In certain cases, the mathematical standards are applicable only if a minimum number of bids are received. The slight majority suggested that a minimum number of valid bids should be pre-required, while the rest stated the opposite. The most important input is the comment of two participants that the minimum number of bids is related to the trustworthiness of the mean of the bids. Thus, the conclusion that a minimum number of bids is required for the applicability of relative standards is confirmed.

The line of reasoning of the participants being against the prerequisite for a minimum number of bids is that even when two bids are received, they can still be abnormally low and they may need to be investigated. This approach is logical as it is also logical that in order to apply relative standards a minimum number of bids is necessary. Consequently, the answer to the question whether there should be a prerequisite of a minimum number of bids is that it depends on the standards to be applied and this is the reason why opinions of the respondents diverge.

(*) Notice that few participants are considered not to have answered this question because the responses given were about the legitimacy of setting a prerequisite for a minimum number of bids and not about whether they would recommend it.
<table>
<thead>
<tr>
<th>Question</th>
<th>Topic / Statement</th>
<th>Form</th>
<th>Respondent</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Duties of the Client</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q.1.L</td>
<td>It is a right, not a duty for the client to investigate suspicious tenders</td>
<td>A</td>
<td>10</td>
<td>10/10</td>
</tr>
<tr>
<td></td>
<td>The only duty for the client is to investigate a tender before rejecting it</td>
<td>C</td>
<td>10</td>
<td>10/10</td>
</tr>
<tr>
<td></td>
<td>The explanation provided in written by the contractor becomes part of the offer</td>
<td>C</td>
<td>3</td>
<td>3/10</td>
</tr>
<tr>
<td>Q.2.L</td>
<td>It is a right, not a duty for the client to reject a tender for which the explanation provided by the contractor was unsatisfactory</td>
<td>A</td>
<td>10</td>
<td>10/10</td>
</tr>
<tr>
<td>Q.3.L</td>
<td>In principal the contractor is not allowed to make alterations in his bid</td>
<td>A</td>
<td>10</td>
<td>10/10</td>
</tr>
<tr>
<td></td>
<td>In practice, some changes may be allowed to a limited extent as long as they do not result in a 'new bid' and competition is not harmed</td>
<td>C</td>
<td>5</td>
<td>5/10</td>
</tr>
<tr>
<td></td>
<td><strong>Automatic Formula</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q.4.L</td>
<td>Setting mathematical standards to identify ALTs is permissible either in national law or in the tender documents, given that explanations will be asked before rejecting a tender</td>
<td>A</td>
<td>10</td>
<td>10/10</td>
</tr>
<tr>
<td></td>
<td>It is suggested to set mathematical standards in the tender documents (case specific) or to set general standards in the national law provided that their use would not be binding</td>
<td>C</td>
<td>3</td>
<td>3/10</td>
</tr>
<tr>
<td></td>
<td>It is suggested to set the formula in the Gids Proportionaliteit</td>
<td>C</td>
<td>1</td>
<td>1/10</td>
</tr>
<tr>
<td>Q.5.L</td>
<td>Mathematical standards should be set in the tender documents of the award phase</td>
<td>A</td>
<td>10</td>
<td>10/10</td>
</tr>
<tr>
<td></td>
<td>It is suggested to set the formula earlier, in the client's general tender guidelines</td>
<td>C</td>
<td>1</td>
<td>1/10</td>
</tr>
<tr>
<td></td>
<td><strong>Technical Details</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q.6.L</td>
<td>A minimum number of valid bids should be pre-required for the applicability of standards</td>
<td>A</td>
<td>4</td>
<td>4/10</td>
</tr>
<tr>
<td></td>
<td>A minimum number of valid bids should not be pre-required for the applicability of standards</td>
<td>A</td>
<td>3</td>
<td>3/10</td>
</tr>
<tr>
<td></td>
<td>No answer (*)</td>
<td>A</td>
<td>3</td>
<td>5/10</td>
</tr>
<tr>
<td></td>
<td>To act upon the mean of the bids it should be trustworthy, which depends on the number of bids</td>
<td>C</td>
<td>2</td>
<td>2/10</td>
</tr>
<tr>
<td>Q.8.L</td>
<td>There is no transfer of liability to the client by using the cost estimation as a standard</td>
<td>A</td>
<td>10</td>
<td>10/10</td>
</tr>
<tr>
<td></td>
<td>Juridical consequences do not come with standards for the identification of ALTs, but with the argumentation on the client's decision on whether to reject a tender</td>
<td>C</td>
<td>5</td>
<td>5/10</td>
</tr>
</tbody>
</table>

*Figure 35: Summary of the results of the 1st round (1/4)*
The last question addressed solely by legal experts was about the case where the cost estimation of the client is used as a standard. In particular, it was questioned whether this could lead to any transfer of liability to the client for the costs to be incurred during the project’s materialization. All respondents agreed that there is no transfer of liability regardless of the standards that may be used. As it was noticed by half the participants, juridical consequences do not come with the standards, but with the argumentation on the client’s decision to reject a tender or not. For instance, the client has the right not to reject a tender for which the explanation given by the contractor is unsatisfactory, but he is responsible for this decision based on the line of reasoning that was followed.

In the case where relative standards are set into practice and the term “mean of the bids” is referred, it is not always clear whether the calculation of the mean includes the lowest bid itself. All the cost experts agreed that the lowest bid should be part of the calculated mean. Four experts commented that to have a more trustful mean the lowest and the highest tender should be omitted from the calculation when there is sufficient number of bids. Furthermore, in the proposal for a new Directive presented in the 8th chapter, the deviation from the 2nd lowest tender was used as an indicator together with the deviation from the mean of the bids. The vast majority of the participants claimed that the deviation from the 2nd lowest tender does not indicate anything and should not be part of the standards.

An important part of the interviews was to analyze thoroughly the application of mathematical standards for the identification of ALTs. Initially, all participants were asked to suggest a percentage deviation from the cost estimation and from the mean of the bids that would make them suspicious of a bid. Not all respondents gave numerical answers. As expected, the majority of the legal experts did not give numerical answers, while the majority of the cost experts did. An interesting observation is that all the legal experts that gave numerical answers and all the cost experts that did not give numerical answers are working on the client’s side.

The deviation from the mean of the bids suggested by cost experts is on average 25% and by legal experts 37.5%, while the deviation from the cost estimation is 20% and 32% respectively. The fact that legal experts suggested a significantly ‘higher’ deviation than cost experts can be attributed to two factors. The expertise of cost engineers on the topic led to accurate answers and the business culture of legal experts led to answers that are “on the safe side”. Another observation is that both groups suggested a ‘lower’ deviation from the cost estimation than from the mean of the bids. Thus, the participants indicated through their answers that absolute standards should be tighter than relative standards.

The answers of the cost experts provide themselves for further analysis. First thing to notice is that the bandwidth of answers (15 - 35 %) is the same for absolute and relative standards. Consequently, within those margins there is some ambiguity on whether a tender raises suspicions and needs to be investigated. However, above the limit of 35%, regardless of the standard that is used, it is undoubtful that tenders should be investigated. In legal terms, this could be translated in the suggestion that clients should have the right to decide whether they will investigate tenders that deviate in-between 15 - 35 %, but they should be obliged to investigate tenders that deviate more.
### Technical Details

<table>
<thead>
<tr>
<th>Question</th>
<th>Topic / Statement</th>
<th>Rate</th>
<th>Form</th>
<th>Respondent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Q.5.C</strong></td>
<td>The calculation of the mean includes the lowest bid too</td>
<td>10/10</td>
<td>A/C</td>
<td>10 5 2 3</td>
</tr>
<tr>
<td></td>
<td>To have a more trustful mean the lowest and the highest tender should be omitted from the calculation when there is sufficient number of bids</td>
<td>4/10</td>
<td>C</td>
<td>- 4 1 2 1</td>
</tr>
<tr>
<td><strong>Q.6.C</strong></td>
<td>It is not suggested using the deviation from the 2nd lowest tender as an indicator</td>
<td>8/10</td>
<td>A</td>
<td>8 3 2 3</td>
</tr>
<tr>
<td></td>
<td>It would be interesting to know the deviation from the 2nd lowest tender, but not an indicator</td>
<td>2/10</td>
<td>C</td>
<td>2 2 - -</td>
</tr>
</tbody>
</table>

#### Relative Standards

<table>
<thead>
<tr>
<th>Question</th>
<th>Topic / Statement</th>
<th>Rate</th>
<th>Form</th>
<th>Respondent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Q.1.C</strong></td>
<td>Average of responses: 25%</td>
<td>8/11</td>
<td>A</td>
<td>8 3 3 2</td>
</tr>
<tr>
<td></td>
<td>Bandwidth of responses: 15 - 35 %</td>
<td></td>
<td></td>
<td>3 2 - 1</td>
</tr>
<tr>
<td><strong>Q.7.L</strong></td>
<td>Average of responses: 37.5%</td>
<td>4/10</td>
<td>A</td>
<td>4 - - -</td>
</tr>
<tr>
<td></td>
<td>Bandwidth of responses: 20 - 50 %</td>
<td></td>
<td></td>
<td>1 1 4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Topic / Statement</th>
<th>Rate</th>
<th>Form</th>
<th>Respondent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>For DBFM projects the deviation set as a standard should be the same as in DC</td>
<td>4/11</td>
<td>C</td>
<td>4 1 2 1</td>
</tr>
<tr>
<td></td>
<td>For DBFM projects the deviation set as a standard should be different (not quantified)</td>
<td>4/11</td>
<td>C</td>
<td>3 2 - 1</td>
</tr>
<tr>
<td></td>
<td>For DBFM projects the deviation should 5-10% more than DC only due to the finance part (F), depending on the duration of the concession period and the time of the first payment</td>
<td>1/11</td>
<td>C</td>
<td>1 - - -</td>
</tr>
</tbody>
</table>

#### Absolute Standards

<table>
<thead>
<tr>
<th>Question</th>
<th>Topic / Statement</th>
<th>Rate</th>
<th>Form</th>
<th>Respondent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Q.2.C</strong></td>
<td>Average of responses: 20%</td>
<td>8/11</td>
<td>A</td>
<td>8 3 3 2</td>
</tr>
<tr>
<td></td>
<td>Bandwidth of responses: 15 - 35 %</td>
<td></td>
<td></td>
<td>3 2 - 1</td>
</tr>
<tr>
<td><strong>Q.9.L</strong></td>
<td>Average of responses: 32%</td>
<td>3/10</td>
<td>A</td>
<td>3 - - -</td>
</tr>
<tr>
<td></td>
<td>Bandwidth of responses: 20 - 50 %</td>
<td></td>
<td></td>
<td>7 2 1 4</td>
</tr>
<tr>
<td></td>
<td>For DBFM projects the deviation set as a standard should be the same as in DC</td>
<td>6/11</td>
<td>C</td>
<td>6 1 3 2</td>
</tr>
<tr>
<td></td>
<td>For DBFM projects the deviation set as a standard should be different (not quantified)</td>
<td>2/11</td>
<td>C</td>
<td>2 2 - -</td>
</tr>
<tr>
<td></td>
<td>For DBFM projects only the realization costs should be taken into account</td>
<td>2/11</td>
<td>C</td>
<td>2 - 1 1</td>
</tr>
</tbody>
</table>

*Figure 36: Summary of the results of the 1st round (2/4)*
At this point we need to repeat that the questions were asked in the context of both DC and DBFM contracts. Nevertheless, some cost experts differentiated their answers for DBFMs, but without quantifying the difference from DCs. Specifically, half the respondents stated that the deviation from the mean of the bids should be different for DBFMs. Half of those stated the same for the deviation from the cost estimate and the other half claimed that if the cost estimate is used only the realization costs should be compared and thus the standards should be the same with DC. Finally, three experts argued that finance (F) is a significant part of the cost estimate and adds to the deviation of tenders. Because experts’ opinions diverge on this matter, it will be investigated further in the 2nd round.

As it was noticed in the 8th chapter there is a tendency to regulate relative standards, while in practice contracting authorities use their cost estimation internally as an indicator. The majority of legal and cost experts explained that setting the cost estimate as a standard is difficult. From a legal perspective, in order to use the cost estimate as a standard the clients should be able to argue on their estimate and substantiate it. However, as it was argued by cost experts, estimating the cost is a very complex task performed differently by clients and contractors. First of all, bidders unlike contracting authorities estimate the cost based on market economics. As explained by almost half of the legal experts, the added value of relative standards is that they reflect market conditions.

On the contrary, the main disadvantage of relative standards, according to both groups of experts, is that they leave space for manipulation of the process. Overall, absolute as well as relative standards have advantages and disadvantages. This was reflected in the suggestions of the participants which diverge proportionally between the two approaches. Interestingly, apart from one those that opted for absolute standards are cost experts, arguing that they have insight on how the cost estimate was build up. Accordingly, apart from one those that chose relative standards are legal experts. The most important finding is that the slight majority of the participants suggested using both standards. Specifically, it was commented that below a certain number of received bids the trustworthiness of their mean diminishes and the client should fall back in using the cost estimate.

(*** In the 1st round only cost experts were asked whether they would suggest absolute or relative standards. For consistency reasons the question was also made to legal experts in the 2nd round.

In terms of the open discussion, several participants expressed their opinion towards the application of mathematical standards for the identification of ALTs. Some were in favor of such a perspective, while others were against it. Arguments in favor were that establishing standards would stimulate the contractors’ performance and allow clients to manage ALTs in a unified way that would also be time saving. On the contrary, those against using mathematical standards argued that contractors would adjust their bids in a level higher than the thresholds and that the standards cannot examine the internal consistency of bids. Lastly, a legal expert from the client’s side claimed that mathematical standards need to be different for different markets, depending on how competitive the market is.

A rather different approach on the standards to identify ALTs was also suggested. Specifically, experts on the legal side proposed setting in the tender documents, only in qualitative terms, a list of factors to be examined including the cost estimate, the mean of the bids, etc. According to cost engineers, another factor to be examined in the process of investigating for ALTs is the risk distribution because in integrated contracts risk is put into tender and thus the risks need to be treated during tendering. Overall, since there is no consensus on whether a quantitative (mathematical standards) or qualitative approach is more adequate for the identification of ALTs, the issue will be analyzed further in the 2nd round, taking into consideration the input of the 1st round.
<table>
<thead>
<tr>
<th>Question</th>
<th>Topic / Statement</th>
<th>Form</th>
<th>Respondent</th>
<th>Rate</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>A/C</td>
<td>LE</td>
<td>Cli</td>
</tr>
<tr>
<td><strong>Legislation vs Practise</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q.3.C</td>
<td>Legally establishing the cost estimate as a standard is difficult</td>
<td>A</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Q.10.L</td>
<td>Cost estimation is a complex task performed differently by clients and contractors</td>
<td>C</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>To use the cost estimate as a standard the client would have to be able to argue on it</td>
<td></td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Relative standards are legally established because they reflect market conditions</td>
<td>A</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>No answer</td>
<td></td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td><strong>Absolute vs Relative Standards</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q.4.C</td>
<td>It is suggested to use the cost estimate as a standard (absolute standards)</td>
<td>A</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Q.4.L **</td>
<td>It is suggested to use the mean of the bids as a standard (relative standards)</td>
<td>A</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>It is suggested to use both absolute and relative standards</td>
<td></td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Relative standards create space for manipulation of the tender process</td>
<td></td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td><strong>Mathematical Standards</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>D.</strong></td>
<td>It is suggested to legally establish mathematical standards for the identification of ALTs</td>
<td>C</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>It is not suggested to legally establish mathematical standards for the identification of ALTs</td>
<td>C</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>It is commented that mathematical standards need to be different for different markets, depending on how competitive is the market</td>
<td></td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td><strong>Qualitative Standards</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>D.</strong></td>
<td>It is suggested to set in the tender documents, only in qualitative terms, a list of factors to be examined for the identification of ALTs including the cost estimate, the mean of the bids, etc.</td>
<td>C</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>It is suggested to examine the risk distribution in the process of identifying ALTs</td>
<td></td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td><strong>Integrated Contracts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>D.</strong></td>
<td>Integrated contracts make cost estimation much more complex for the contracting authority as the project is yet to be designed and thus the scope for which the cost is calculated is uncertain</td>
<td>C</td>
<td>4</td>
<td>7</td>
</tr>
</tbody>
</table>

*Figure 37: Summary of the results of the 1st round (3/4)*
Comments and suggestions were made also in relation to the key concepts, in the context of which ALTs are studied. The majority of all participants argued that integrated contracts make cost estimation much more complex for the client, as the project is yet to be designed, and thus the scope for which the cost is calculated is uncertain. Differences in the project scope conceptualized by the client and the contractors make it difficult for the former to evaluate the received bids. In other words, it appears that integrated contracts make the identification of ALTs more difficult. Because of the importance of such a potential finding, a relevant question will be made during the 2nd round.

In order to facilitate the identification of ALTs in the context of integrated contracts, legal and cost experts suggested asking for price specifications to be included in the bids. Those participants work on the clients’ side and thus express their insight on the difficulties in evaluating the bids and the potential for improvement. However, the question, then, arises: how to break down the cost in order to ask for price specifications. A cost expert stated that the breakdown of cost can be based on the works to be performed by different subcontractors or based on the parts of the project financed by different parties. The level of detail in the specifications is crucial because asking for too detailed specifications can limit the design freedom of the contractor. The option of asking for price specifications will be examined in the 2nd round, as it appears to have both pros and cons.

Cost experts made suggestions on how to improve the capacity of clients to estimate the cost and to evaluate the contractors’ estimates. First of all, working towards the creation of an extensive cost reference database is required to improve the accuracy of the cost estimation. Because a common definition of what is involved in the calculation of the different cost elements is lacking, the interpretation and comparative evaluation of cost estimates is difficult. An improvement, as suggested, would be to standardize the breakdown of cost. Such a model is for instance the SSK2010, which could formulate the basis to develop a widely acceptable framework for the cost breakdown.

The participants elaborated further on the way clients estimate the cost and some differences in comparison to the contractor’s approach were pointed out. Respondents expressing the clients’ side stated that the clients’ estimate, which is based on a reference design, is conservative. The reason is that the cost estimate is related with the budget allocated to the project and if the estimated project cost is low there is a risk of insufficient budget reservation in the long term. On the contrary, as commented by both legal and cost experts, contractors take into account market conditions and lower the cost in their offer so as to ensure continuity in their work. Another difference, explained by experts on the client’s side, is that clients calculate the total project costs which involve non-contract costs to be incurred only by the client. Those costs are not calculated by the contractor because they are not part of the bid price. Thus, if the cost estimation of the client is used as a standard, only the part of the contract costs should be taken into account.

Experts on both sides underlined that if the deviation of the bid(s) from the cost estimation is severe then the client needs to re-examine the scope for which the cost was estimated and the contract formulation. The reason, as indicated by the client’s side, is that functional specifications leave space for misinterpretations from the contractor but also the client. Thus, contractor(s) may have misinterpreted the specifications either intentionally or not. In the first case, contractors may have encountered space to charge for lower costs initially so as to win the contract and then charge for extra work during contract execution. Again the implications of integrated contracts are evident, as a detailed design that would facilitate setting technical specifications is lacking.
<table>
<thead>
<tr>
<th>Question</th>
<th>Topic / Statement</th>
<th>Form</th>
<th>Respondent</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>D.</td>
<td>It is suggested asking for price specifications to be included in the bids</td>
<td>2 2 3 -</td>
<td>LE CO Cli Con Bo</td>
<td>4/20</td>
</tr>
<tr>
<td>D.</td>
<td>The cost estimate of the client does not take into account market conditions</td>
<td>4 2 4 -</td>
<td>2</td>
<td>6/20</td>
</tr>
<tr>
<td>D.</td>
<td>It is suggested to focus on improving the cost estimation by standardizing the cost breakdown and to create an extensive cost reference database, required to improve the accuracy of the cost estimation</td>
<td>2 1 -</td>
<td>1</td>
<td>2/10</td>
</tr>
<tr>
<td>D.</td>
<td>The client’s cost estimate, which is based on a reference design, is conservative because if the cost estimate is low there is a risk of insufficient budget being allocated to the project in the long term</td>
<td>3 3 -</td>
<td>-</td>
<td>3/10</td>
</tr>
<tr>
<td>D.</td>
<td>Clients calculate the total project costs which involve non-contract costs to be incurred by the client that are not calculated by the contractor and thus not included in the bid price.</td>
<td>2 2 -</td>
<td>-</td>
<td>2/10</td>
</tr>
<tr>
<td>D.</td>
<td>The breakdown of cost can be based on the works to be performed by different subcontractors or based on the parts of the project financed by different parties. The level of detail is crucial.</td>
<td>1 1 -</td>
<td>-</td>
<td>1/10</td>
</tr>
<tr>
<td>D.</td>
<td>If the deviation of the bid(s) from the cost estimation is severe then the contracting authority needs to re-examine the scope for which the cost was estimated</td>
<td>4 2 1</td>
<td>1</td>
<td>4/10</td>
</tr>
<tr>
<td>D.</td>
<td>Finance (F) is a significant part of the cost estimate and thus adds to the deviation of tenders</td>
<td>3 1</td>
<td>1 1</td>
<td>3/10</td>
</tr>
<tr>
<td><strong>Cost Estimation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D.</td>
<td>Functional specifications leave space for misinterpretations from the contractor and the client</td>
<td>- 2 2</td>
<td>-</td>
<td>2/10</td>
</tr>
<tr>
<td>D.</td>
<td>If bids deviate vastly contractor(s) may have encountered space for misinterpretations in a way that lower costs are charged initially to win the contract and extra work will be charged during execution</td>
<td>- 1 1</td>
<td>-</td>
<td>1/10</td>
</tr>
<tr>
<td><strong>Functional Specifications</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D.</td>
<td>The EMAT would contribute in avoiding ALTs but because quantifying the quality aspects is very complex and is not done in a unified way it makes the identification of ALTs even more difficult</td>
<td>- 2</td>
<td>-</td>
<td>2/10</td>
</tr>
<tr>
<td>D.</td>
<td>Clients often implement the EMAT mechanism in a way that the price criterion is dominant</td>
<td>1 1 -</td>
<td>-</td>
<td>2/20</td>
</tr>
<tr>
<td><strong>EMAT mechanism</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D.</td>
<td>Clients cannot exclude the possibility of cost escalation, extra works and conflicts if awarding the contract to any tender even if it not the lowest and thus tend to choose for the lowest</td>
<td>1 2 1</td>
<td>-</td>
<td>2 3/20</td>
</tr>
<tr>
<td>D.</td>
<td>When a very low tender is selected the client should be prepared to spend more money on supervision</td>
<td>- 1 -</td>
<td>1</td>
<td>1/10</td>
</tr>
<tr>
<td>D.</td>
<td>If the clients always opt for the lowest price, in the longer term this would lead to a monopoly</td>
<td>- 1 1</td>
<td>-</td>
<td>1/10</td>
</tr>
</tbody>
</table>

*Figure 38: Summary of the results of the 1st round (4/4)*
As it is aptly noticed by both legal and cost experts the EMAT award mechanism instead of assisting in the avoidance of ALTs, it adds complexity in the identification of ALTs. According to cost experts, the process of quantifying the quality aspects is very demanding and is not done in a unified way. In particular, because measuring the contractors’ performance on the qualitative aspects is difficult there is a tendency to attribute similar scores for the bids’ performance on the qualitative criteria. As a result, the price criterion remains dominant. Most importantly, in such cases the evaluation process is not efficient in examining the quality that is offered for a certain price and from this perspective identifying whether the tender is abnormally low is difficult.

Lastly, an explanation was given about why clients in some cases are receptive to very low tenders. It was indicated that clients cannot exclude the possibility of cost escalation, extra works and conflicts if awarding the contract to any tender even if it not the lowest and thus tend to choose for the lowest. However, it was recognized by cost experts that opting for very low tenders has negative consequences. On a project basis, when a very low tender is selected then the client should be prepared to spend more money on supervision. On the long term, if a client always opts for very low tenders this could lead to a monopoly.

Finally, it should be noticed that during the first round of interviews several suggestions were given on how to cope with the phenomenon of ALTs that are not presented in this section but can be found in Appendix (H). The reason is that those suggestions are not directly related to ALTs, even though indirectly could contribute in dealing with ALTs. For instance it was suggested to make more extensive use of Value Based Tendering, to better account for risks as risk negligence can lead to the submission and possibly to the acceptance of an ALT. An interesting suggestion was to require the tenderers to sign a declaration that they will not bid below cost. In such a case, clients should state in the tender documents that bids below cost will be rejected. This suggestion - even though directly related to ALTs - is still outside the scope of this research that is the identification of ALTs, as it is a measure to avoid the submission of ALTs.
7.3. Second Round

The 2nd round of interviews was aimed to validate certain findings of the 1st round and to investigate some issues that were raised during the 1st round by the participants. Thus, an overview of the results of the 1st round was provided to the respondents together with the questions of the 2nd round. Again two sets of interview questions were formulated, but six out of eight questions were in common for both groups of experts so as to arrive at sound conclusions (Appendix H). The participants were given the option to conduct the interview in person or to respond through email. Due to time restrictions, the respondents chose the latter, with one exception. All the participants of the 1st round were re-contacted and the rate of responses of the 2nd round was (18/20).

In the 1st round, part of the respondents was in favour of establishing mathematical standards for the identification of ALTs. Some of the participants that were against mathematical standards, proposed a qualitative approach. In the 2nd round, the majority of the participants opted for a qualitative approach. Specifically, experts were supportive of setting in qualitative terms a list of factors to be examined in the process of investigating for ALTs. The factors to be examined go beyond the deviation from the mean of the bids and the cost estimation. As it was suggested by cost experts already in the 1st round, the risk distribution should be explicitly examined. In the 2nd round, a cost expert suggested to examine the ratio between direct and total costs, so as to check for very low or negative overhead costs.

The application of mathematical standards solely was suggested only by one participant. However, almost one third of the participants proposed using both mathematical and qualitative standards. The discussion about following a qualitative and/or a quantitative approach appears to be related with the next question about whether the standards should be set in national law or in the tender documents. The national law applies to all the types of contracts, projects and markets for which developing unified mathematical standards is neither feasible nor meaningful. Thus, the participants that opted for using quantitative standards - solely or complementary to qualitative ones - suggested setting the standards in the tender documents.

The vast majority of all participants argued that the standards need to be set in the tender documents so as to be adjusted to the project context. All the respondents that opted for the tender documents are working solely or partly on the client’s side. On the contrary, all the participants working solely on the contractor’s side suggested to set the standards in the national law. As commented by legal experts, setting the standards in the national law safeguards the transparency, equality and proportionality of the process. The counterargument is that setting standards in national law would be very restrictive. This explains the suggestion to set the standards in the national law as provisions the use of which is not obligatory.

Following this line of reasoning few participants suggested, either in the 1st or in the 2nd round, to set the standards in the Gids Proportionaliteit. Because the Gids Proportionaliteit is not applicable for utilities, the standards would not be applicable for certain infrastructure projects (e.g. rail projects) and thus this option is rejected. Finally, few participants from the client’s side expressing both disciplines proposed an intermediate solution, to set the standards in the client’s tendering guidelines. As it was argued this would preserve competition, enhance transparency and simultaneously give the chance to adjust the standards on a market basis.
<table>
<thead>
<tr>
<th>Question</th>
<th>Topic / Statement</th>
<th>Form</th>
<th>Respondent</th>
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<td></td>
<td>Standards</td>
<td></td>
<td>A/C</td>
<td>LE</td>
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<tr>
<td>Q.2.L</td>
<td>It is suggested to use quantitative standards to identify ALTs</td>
<td>A</td>
<td>1 - 1 -</td>
<td>A/C</td>
</tr>
<tr>
<td>Q.2.C</td>
<td>It is suggested to use qualitative standards to identify ALTs</td>
<td></td>
<td>A</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>It is suggested to use both standards to identify ALTs</td>
<td>A</td>
<td>3 - 3 - 1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>It is suggested to examine the ratio between direct and total costs to verify low overhead costs in DC</td>
<td>C</td>
<td>- 1 - -</td>
<td>1</td>
</tr>
<tr>
<td>Q.2.L</td>
<td>It is suggested to use quantitative standards to identify ALTs</td>
<td>A</td>
<td>4 - 6 - 5</td>
<td>2</td>
</tr>
<tr>
<td>Q.2.C</td>
<td>It is suggested to use qualitative standards to identify ALTs</td>
<td></td>
<td>A</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>It is suggested to use both standards to identify ALTs</td>
<td>A</td>
<td>3 - 3 - 1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>It is suggested to examine the ratio between direct and total costs to verify low overhead costs in DC</td>
<td>C</td>
<td>- 1 - -</td>
<td>1</td>
</tr>
<tr>
<td>Q.3.L</td>
<td>It is suggested to establish the standards in the national law</td>
<td>A</td>
<td>1 - 1 - 1</td>
<td>1</td>
</tr>
<tr>
<td>Q.3.C</td>
<td>It is suggested to establish the standards in the national law as suggestions</td>
<td></td>
<td>A</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>It is suggested to establish the standards in the Tender documents to make them context specific</td>
<td></td>
<td>A</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>The national law would be very a very restrictive option, while the tender documents on the contrary would leave a high margin to the client to follow an “amateurish” approach</td>
<td>C</td>
<td>- 1 - 1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>The tender documents give the opportunity to fine-tune the standards with the market conditions</td>
<td>C</td>
<td>- 1 - 1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Technical Details</td>
<td></td>
<td>A/C</td>
<td>LE</td>
</tr>
<tr>
<td>Q.4.C</td>
<td>It is suggested to use different standards for DC and DBFM contracts</td>
<td>A</td>
<td>6 - 2 - 2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>It is suggested to use the same standards for DC and DBFM contracts</td>
<td>A</td>
<td>2 2 - 2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>No answer</td>
<td>C</td>
<td>- 1 - 1</td>
<td>1</td>
</tr>
<tr>
<td>Q.5.C</td>
<td>It is suggested to ask for price specifications in the tenders to facilitate the identification of ALTs</td>
<td>A</td>
<td>8 - 4 1 3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>It is not suggested to ask for price specifications in the tenders to facilitate the identification of ALTs</td>
<td>A</td>
<td>1 1 - -</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>It is commented that it could be asked to make the bids based on the SSK system</td>
<td>C</td>
<td>1 - - 1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>It is suggested asking for man-hours, equipment type and hours, the ratio between: material cost and tender price, maintenance cost and tender price, finance cost and tender price</td>
<td>C</td>
<td>1 - - 1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>It is suggested to ask for specific cost items, instead of asking for price specifications in every tender</td>
<td>C</td>
<td>1 - - 1</td>
<td>1</td>
</tr>
</tbody>
</table>

*Figure 39: Summary of the results of the 2nd round (1/2)*
As discussed in the 1\textsuperscript{st} round, some cost experts commented that different standards should be set for DC and DBFM contracts. The mismatch in the experts’ opinions was encountered also in the 2\textsuperscript{nd} round. The vast majority of the respondents claimed that standards should be different, pointing to the finance part as the main reason. It can be concluded that there is more ambiguity regarding DBFM projects in comparison to DC, which can be related with the additional complexity in breaking down the price offered in the tenders.

The suggestion made in the 1\textsuperscript{st} round to ask for price specifications in the tenders, was debated in the 2\textsuperscript{nd} round with cost experts. Apart from one participant, the rest agreed that price specifications would facilitate the identification of ALTs. As discussed in the 1\textsuperscript{st} round the question is: based on which breakdown of the cost should the client ask for price specifications, to avoid adverse effects. A generic answer to this question cannot be given, because the price specifications depend on the project context. However, the aim of the client should be to gain insight on those aspects of the tender/project that involve significant risks, so as to verify if those risks are treated adequately.

It has become clear that the process of investigating ALTs by asking for explanations needs to focus on specific aspects of the bid(s), both for practical and legal reasons. An important matter is whether the explanation provided by the contractor on those aspects that have raised suspicions is legally binding. The large majority of legal experts confirmed the comments of the 1\textsuperscript{st} round that the explanation is binding. Nevertheless, there is no consensus on whether the explanation becomes also part of the contract. One participant stated that the binding character of the explanation should be stimulated in national law or in the tender documents, if not it would incite false statements.

In the 1\textsuperscript{st} round several participants argued that integrated contracts make cost estimation much more complex for the client because of scope uncertainty, as the project is yet to be designed. The functional specifications used to describe the client’s requirements in an integrated contract allow for design solutions that may differ significantly. Thus, the range of price and quality performance offered in the bids is expected to be broader. Those are the main arguments that led the vast majority of all participants to suggest in the 2\textsuperscript{nd} round that integrated contracts make the identification of ALTs complex.

The analysis up to this point has indicated that developing unified standards for the identification of ALTs in the field of infrastructure projects is difficult. It has been noted that standards should be set in the tender documents to take into account the project context and in particular the market conditions. The field of infrastructure includes markets with diverse characteristics (e.g. rail and road projects). Obtaining knowledge on the market characteristics is necessary for the client to improve the way procurement processes are organized. Almost all participants agreed that analyzing the outcome of previous tender processes - on a market basis - would improve the way projects are tendered by creating an insight on the efficiency and sensitivity of different markets.

From a theoretical perspective, tendering projects that are not economically sustainable indicate inefficiencies in the market. In this research, the concept of economically sustainable procurement has been related with ALTs already in the problem analysis. The reasoning is that awarding the contract to an ALTs leads in projects that are not economically sustainable. This conceptual link was identified in practise by the vast majority of both groups of experts, which confirmed that the identification of ALTs is a step towards the direction of economically sustainable procurement.
<table>
<thead>
<tr>
<th>Question</th>
<th>Topic / Statement</th>
<th>Form</th>
<th>Respondent</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A/C</td>
<td>LE CO Cli  Con Bo</td>
<td></td>
</tr>
<tr>
<td><strong>Technical Details</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Q.5.L</td>
<td>It is suggested that the explanation provided by the contractor is legally binding</td>
<td>A</td>
<td>6 3 1 2</td>
<td>6/9</td>
</tr>
<tr>
<td></td>
<td>It is suggested that the explanation provided by the contractor is not legally binding</td>
<td>C</td>
<td>3 2 - 1</td>
<td>3/9</td>
</tr>
<tr>
<td></td>
<td>The explanation is not necessarily legally binding, the bid counts for the formulation of the EMAT</td>
<td></td>
<td>- 1 - 1</td>
<td>2/9</td>
</tr>
<tr>
<td></td>
<td>The explanation is binding and must become part of the contract, if not it would incite false statements. The binding character must be stimulated in national law or in the tender documents</td>
<td></td>
<td>1 - - 1</td>
<td>1/9</td>
</tr>
<tr>
<td></td>
<td>The explanation is legally binding - like a verbal agreement - and becomes part of the contract - like the notifications (Q&amp;A) during tendering</td>
<td></td>
<td>1 1 - -</td>
<td>1/9</td>
</tr>
<tr>
<td><strong>Integrated Contracts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q.6.L</td>
<td>Integrated contracts make the identification of ALTs more complex</td>
<td>A</td>
<td>7 8 7 3</td>
<td>15/18</td>
</tr>
<tr>
<td>Q.6.C</td>
<td>Integrated contracts don’t make the identification of ALTs more difficult</td>
<td></td>
<td>2 1 2 -</td>
<td>3/18</td>
</tr>
<tr>
<td><strong>Market Analysis</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q.7.L</td>
<td>Analyzing the outcome of previous tenders - on a market basis - would assist in improving the way procurement processes are organized by providing insight on the market characteristics</td>
<td>A</td>
<td>9 8 9 3</td>
<td>17/18</td>
</tr>
<tr>
<td>Q.7.C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Economically Sustainable Procurement</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q.8.L</td>
<td>The identification of ALTs is a step towards the direction of economically sustainable procurement</td>
<td>A</td>
<td>6 8 8 3</td>
<td>14/18</td>
</tr>
<tr>
<td>Q.8.C</td>
<td>ALTs are contrary to embracing sustainable procurement as sustainability elements ‘have their price’</td>
<td>C</td>
<td>1 - - 1</td>
<td>1/18</td>
</tr>
<tr>
<td></td>
<td>It is commented that ALTs are against economically sustainable procurement but from a client’s view</td>
<td></td>
<td>1 - - 1</td>
<td>1/18</td>
</tr>
</tbody>
</table>

*Figure 40: Summary of the results of the 2nd round (2/2)*
7.4. Discussion

7.4.1. Prevention, Detection and Elimination of ALTs

The problem of ALTs has various aspects and accordingly the ways to cope with it are multiple. The three main parts of the problem, as indicated by the Working Group on ALTs, are the prevention, detection and elimination of such tenders (Harrower, 1999). This research and especially the interviews section were oriented towards the detection of ALTs. The detection of ALTs is crucial because even if prevention measures are taken, ALTs may still be submitted and in order to put into force elimination measures the contracting authority needs to identify ALTs. However, some suggestions were also given by the participants regarding the prevention of ALTs being submitted by bidders and/or the elimination of ALTs that have been submitted.

Contracting authorities may decide to follow a proactive approach towards ALTs by asking the bidders to sign a declaration that they will not bid below cost. Alternatively bidders could be given the chance to withdraw the tender if this proves to be abnormally low. In that case the bidder should be bound to pay a penalty equal to the difference between the lowest and the second lowest tender, to avoid the strategic submission of low tenders. It should be noticed that the current legal framework does not allow, in general, for the withdrawal of tenders. Another approach for the prevention of ALTs that is not permissible under the current legal framework would be to use the contractors’ past performance for the identification of ALTs. As commented in the interviews, using the past performance as an indicator seems interesting in theory but is problematic in practice.

A retroactive approach on ALTs would focus on how to deal with tenders that are considered by the client to be abnormally low. For instance, asking the bidders to sign a declaration that they will not bid below cost can be complemented by clarifying that such bids will be rejected. Another approach would be to try to safeguard the project materialization by asking for contract guarantees, namely bank guarantees or surety bonds. A bank guarantee is an unconditional obligation that is payable without having to establish any breach of contract. Conversely, a surety bond is a conditional obligation that is only payable when a breach of contract has been established (ALT Working Group, 2000), which makes it more adequate for the elimination of ALTs.

7.4.2. Detection of ALTs

The identification of ALTs is considered by both groups of experts as a step towards economically sustainable procurement, confirming the main research hypothesis. Establishing a framework for the identification of such tenders is a very demanding task, but can prove beneficial for the contractual parties. Bidders will be motivated to submit tenders that do not involve unreasonably high risks for the project materialization. Also, contracting authorities will be motivated to build on their knowledge and expertise in the field of procurement. Above all, contractual parties will be encouraged to work and improve together as professional counterparts.

In this section, the findings of the two rounds of interviews that led to the conclusions and suggestions regarding the identification of ALTs are presented in Figure 41 and briefly discussed. The existing legal framework leaves sufficient space for the contracting authorities to decide on how to act. Specifically, there is no obligation for the contracting authority neither to request explanations for suspicious tenders, nor to reject tenders for which the explanation given is unsatisfactory. Of course, the client is responsible for his decision and for the corresponding argumentation.
The client does not have a duty but only the right to investigate suspicious tenders

The client does not have a duty but only the right to reject a tender for which the explanation provided in due time by the contractor is unsatisfactory

It is suggested to establish the standards in the national law as suggestions

It is suggested to establish standards in the Tender documents to make them context specific

It is suggested to set quantitative standards in the tender documents

It is suggested to establish the standards in the client’s tendering guidelines

Juridical consequences do not come with standards for the identification of ALTs, but with the argumentation on the client’s decision on whether to reject a tender

It is suggested to use qualitative standards to identify ALTs

It is suggested to use both qualitative and quantitative standards to identify ALTs

It is suggested to examine the risk distribution in the process of identifying ALTs

It is suggested to use the cost estimate as a standard (absolute standards)

It is suggested to use the mean of the bids as a standard (relative standards)

It is suggested to use the mean of the bids as a standard (relative standards)

To act upon the mean of bids it should be trustworthy, which depends on the number of bids

To have a more trustful mean the lowest and the highest tender should be omitted

The calculation of the mean includes the lowest bid too

The deviation from the 2nd lowest tender should not be used as an indicator

Legally establishing the cost estimate as a standard is difficult

Cost estimation is a complex task performed differently by clients and contractors

It is suggested to focus on improving the cost estimation by standardizing the cost breakdown and to create an extensive cost reference database

It is suggested to ask for price specifications in the tenders to facilitate the identification of ALTs

Analyzing the outcome of previous tenders - on a market basis - would assist in improving the way procurement processes are organized by providing insight on the market characteristics

It is suggested to use different standards for DC and DBFM contracts

Finance (F) is a significant part of the cost estimate and thus adds to the deviation of tenders

Relative Standards - Average of responses: 25% - Bandwidth of responses: 15 - 35%

Absolute Standards - Average of responses: 20% - Bandwidth of responses: 15 - 35%

There is no transfer of liability to the client by using the cost estimation as a standard

It is suggested that the explanation provided by the contractor is legally binding

The explanation is binding and the binding character must be stimulated in national law or in the tender documents to avoid false statements

Integrated contracts make the identification of ALTs more complex

The detection of ALTs is a step towards the direction of economically sustainable procurement

| (1 to 2)/10 respondents |
| (3 to 4)/10 respondents |
| 5/10 respondents |
| (6 to 7)/10 respondents |
| (8 to 10)/10 respondents |

Figure 41: Selective overview of interviews’ results
Arriving at the point to reject a tender is difficult for practical and legal reasons. It is logical that such a decision would be disputed on court by the rejected bidder. Moreover, in the long term the market could be discouraged due to rejection of bids by a certain client in the past. Contractors may become reluctant to participate in tendering processes organized by that client. Thus, the aim of clients is to avoid rejecting tenders and any framework to treat ALTs should serve this aim. The objective of a framework to treat ALTs is to provide knowledge, time and legal means for clients and contractors to align their expectations and understanding of the collaboration agreement in which they enter.

The process of investigating suspicious tenders is time consuming and requires client’s expertise. However, the time spent in tendering is considered by the experts to be disproportionally low compared to the preceding conceptualization phase. Thus, when there is ambiguity about a tender consuming time to investigate can prove to be extremely value adding for the project materialization. Furthermore, building on the necessary knowledge to enter an investigation process is an asset for the contracting authority. An interesting analogy can be drawn here between the investigation process and the use of the competitive dialogue: both involve some short of dialogue between the contractual parties, they are time consuming and come together with transaction costs, but the contracting authorities that have experience in applying them are satisfied with the results.

It is true that not all contracting authorities have the same level of experience and expertise in large infrastructure projects. Especially local authorities may get involved in very few large infrastructure projects within very long time periods and thus do not have the chance to develop their expertise. When the client enters the process of asking for explanation from a bidder, he has to be able to use efficiently the information provided. Otherwise, the process may have a backfire effect, because the client is liable for the information that he possesses and the contractor can take advantage of this to behave strategically during project realization. Consequently, the application of any framework for the identification of ALTs should not be mandated by national law.

The provisions of the Dutch procurement act on ALTs, which are identical to the EU Directive, elaborate on the details of a tender in relation to which explanations may be asked. However, there is no reference on the indicators that can be examined to decide which tenders are suspicious. Because the national law concerns a wide variety of projects, establishing unified mathematical standards would be extremely difficult and the value of such standards is doubtful. Instead, it is possible to set a list of factors to be examined, including the deviation from the cost estimation and the deviation from the mean of the bids, but only in qualitative terms. The investigation for ALTs should not be obligatory, but the client should substantiate his decision not to do so, as it is the case with the application of the EMAT award mechanism.

This research aims to provide suggestions to the contracting authorities on how to cope with ALTs and has certain boundaries that include DC and DBFM contracts for infrastructure projects. The boundaries of applicability of the national law are much wider, which makes evident that in order to make any suggestions to be applied on the level of national law, extensive research is required. Thus, the aforementioned only constitute indications of a general direction on which the research could be driven. The upcoming revision of the EU Directive and the consequent amendment of the Dutch Procurement Act constitute a reason for this research to take place.
Contracting authorities involved in large infrastructure projects should establish a process to be followed for the detection of ALTs in the tendering guidelines. In practice, clients use indicators to decide whether to investigate tenders, but this is mostly done internally. The reason to act on the level of tendering guidelines is to achieve uniformity and transparency of the process. In particular, clients should set in their tendering guidelines for DC and DBFM contracts a list of factors to be examined for the detection of ALTs in qualitative terms and add that certain factors will be quantified in the tender documents. The deviation from the cost estimation, the deviation from the mean of the bids and the risk analysis should be the main factors.

The extensive consultation of legal and cost experts provided an insight on the characteristics of a potential framework to identify ALTs. At first sight, there is no consensus on whether absolute or relative standards should be applied. The reason is that it depends on certain factors, which led the majority of respondents to suggest using both standards. The applicability of relative standards depends on receiving a sufficient number of bids for their mean to be trustworthy. On the other hand, using the cost estimation requires the client to be competent on the type of project that is tendered. Consequently, it is suggested to use the cost estimate as an indicator when a few tenders are received, provided that the client has sufficient knowledge of the project type. Above a certain number of received bids the mean of the bids should be trusted as an indicator.

Regardless of using absolute or relative standards, up to a certain deviation there is ambiguity on whether tenders should be examined. However, above that point it is undoubtful that the tenders need to be investigated. Based on this concept it is suggested to use gradual standards. That is, the client should decide on a project-basis whether to investigate tenders that deviate less than a certain threshold. The risk analysis should be considered in deciding whether to investigate. Above that threshold the investigation of tenders should be mandatory. The aforementioned qualitative characteristics, combined with the quantitative information provided by cost experts led to the development of an exemplar of a framework for the detection of ALTs to be set in the tender documents (Figure 42).

The framework can be read as follows: If a tender deviates 15 – 35 %, the client should decide whether to investigate the tender or not. The risk analysis needs to be taken into consideration. If the deviation is more than 35% the client is obliged to investigate the tender(s). If the number of received bids is less than 5, the client should use the cost estimation as an indicator. If the number of bids is at least 5, the client should use the mean of all the bids as an indicator. Lastly, if the number of bids is at least 7, the highest and the lowest bid should be omitted from the calculation of the mean.

<table>
<thead>
<tr>
<th>Deviation of Tender</th>
<th>Action</th>
<th>Number of bids</th>
<th>Suggested Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 - 35 %</td>
<td>Optional Investigation</td>
<td>&lt; 5</td>
<td>Cost estimation</td>
</tr>
<tr>
<td>&gt; 35 %</td>
<td>Obligatory Investigation</td>
<td>≥ 7</td>
<td>Mean of the bids excluding the highest and lowest</td>
</tr>
</tbody>
</table>

Figure 42: Framework for the detection of ALTs based on consultation with legal and cost experts
It needs to be made explicit that the only purpose that this exemplar serves is to indicate the main characteristics of a potential framework. To develop effective mathematical standards contracting authorities need to make research on the type of standards and the corresponding thresholds. The standards need to be context specific and to be fine tuned with market conditions. Moreover, the outcome of previous tenders should be analyzed to determine the efficiency and sensitivity of the market. This will provide insight on whether ALTs should be expected as a result of the market characteristics. Focusing on the standards and thresholds to detect ALTs is not sufficient by itself, because those constitute only the indicators to be used.

To facilitate the detection of ALTs the accuracy of the client’s cost estimation needs to be improved, which has diminished due to the introduction of integrated contracts. Developing an extensive cost reference database is necessary. Because clients and contractors calculate cost in a different way, the client faces difficulties in understanding how the bid prices are build up. Establishing a common definition of the cost elements is a very demanding but valuable improvement. To simplify the detection of ALTs it is suggested to ask for price specifications to be included in tenders. This requires a breakdown of the cost that can be done only on a project basis. Specifications should not be very detailed, to avoid limiting the bidders’ design freedom.

Lastly, from a legal perspective, the standards to be used to detect ALTs do not cause any transfer of liability to the client. Juridical consequences come with the argumentation on the client’s decision on whether to reject a tender or not. The explanation provided by the contractor, if acceptable, is legally binding for the materialization of the project. In a different case asking for an explanation would incite false statements. In order to ensure that the explanation is considered to be binding, the client needs to stimulate the binding character in the tender documents.
8. Results - Conclusion - Recommendations

8.1. Results
Dealing with ALTs is a multidimensional problem consisting of the prevention, detection and elimination of such tenders. This thesis focused on the part concerning the identification of ALTs. The objective of the research was to contribute to the direction of achieving economically sustainable procurement by elaborating on the identification of abnormally low tenders. Based on this objective, the main research question was formulated and decomposed in four sub-questions. In this section, the answers of the main research question and sub-questions are presented. Those are derived from:

- the intermediate findings of the literature study and the chapters about the legal framework and the procurement of infrastructure projects in the Netherlands, validated through the interviews
- further findings derived from and validated during the two rounds of interviews

SQ1. What is the legal framework about ALTs?
The concept of ALTs is regulated in the current EU Directive, which refers to the aspects of a tender in relation to which it may be considered abnormally low. According to the Directive the contracting authority shall investigate tenders that raise suspicions of being abnormally low. However, there is no indication of what constitutes such a tender. Based on case law, the phenomenon of ALTs should be related with objective concepts and particularly with the economic sustainability of bids. Moreover, case law confirms that mathematical standards are permissible for the identification of tenders for which further investigation is needed, provided that they are known to all bidders in advance. Specifically, it is permissible to establish the standards either in national law or in the tender documents as an extra award criterion.

Eight out of the twenty seven EU Members have established in their national legislation absolute and/or relative standards for the identification of ALTs. The former examine only on the given tender “per se” and the latter correlate the tender to the other tenders received. In the Netherlands, the new Procurement Act that came into force in April 2013 has the same provisions on ALTs as the previous one, which are identical to those in the EU Directive. A proposal for the revision of the EU Directive is currently under finalization and involves a revision of the article on ALTs. The Netherlands, following the upcoming revision of the EU Directive, will have to enact upon the issue of ALTs when the new Dutch procurement act will be amended. In the initial version of the proposal, mathematical standards for the identification of ALTs were included. Those standards were arbitrary and were rejected in the process of negotiating the final proposal.

The standards in the initial version of the proposal were complemented with the description of a duty for the contracting authority to investigate ALTs. In the negotiation process, the EU commission decided that whether there is such a duty should be a matter for the Member States to decide on. Currently, there is no duty but only a right for contracting authorities to investigate ALTs. The only duty that exists it to ask the bidder for explanations in written, on precise points of the bid, before deciding on whether to reject it. In case the explanation provided in due time by the bidder is not satisfactory, the client has the right to decide if the bid will be rejected. In case the explanation is not satisfactory, the bidder is not allowed to make any alterations in his bid. In practice, some changes may be allowed to a certain extent, provided that competition is not harmed. However, those changes cannot be extensive enough to overcome the tender being considered abnormally low.
The application of standards for the identification of tenders for which explanation shall be asked, does not transfer any short of liability to the contracting authority by itself. The juridical consequences come with the substantiation of the client’s decision to reject a tender or not, based on the explanation provided by the bidder. It appears that the explanation provided in written is legally binding for the project materialization if accepted. To avoid false statements the contracting authority shall stimulate the binding character of the explanation in the tender documents.

SQ2. Which are the standards that can be used for the identification of ALTs?

As aforementioned, the two main approaches on standards for the identification of ALTs are absolute and relative standards. Absolute standards use as an indicator the deviation of the (lowest) tender from the cost estimation of the client. Relative standards use as an indicator the deviation from the mean of the bids. A minimum number of received bids is often required for the applicability of relative standards, to strengthen the trustworthiness of the calculated mean. Based on the same line of reasoning, when the number of received bids is sufficient the highest and the lowest bid can be omitted from the calculation of the mean. On the contrary, below a certain number of bids the mean cannot constitute a trustful indicator.

In the proposal for a new Directive, the deviation from the 2nd lowest bid was used as an indicator together with the deviation from the mean. Nevertheless, it has proven to be extremely doubtful that the deviation between the two lowest tenders indicates anything. The number of European countries that use absolute and relative standards is equal. Slightly less are the countries that use both standards depending on the number of valid bids that are received. In practise, contracting agencies tend to use the deviation from their cost estimation as an indicator, but internally.

Absolute as well as relative standards have both advantages and disadvantages. The competitive advantage of relative standards is that they reflect market conditions. The main disadvantage is that they create space for manipulation of the mean of the bids and therefore of the process. In contrast, absolute standards are advantageous in that they can be applied regardless of the number of bids. The most important impediment is that in order to be used, the contracting authority has to be able to substantiate the cost estimation and argue on it.

SQ3. What are the implications of integrated contracts and the EMAT award mechanism for the identification of ALTs?

In the literature, ALTs are examined regardless of the award mechanism and the form of collaboration between the client and the contractor. However, the application of the EMAT mechanism and the use of integrated contracts were proven to have negative implications for the detection of ALTs, confirming the underlying hypothesis of this research sub-question. The EMAT mechanism would be expected to contribute in avoiding phenomena of ALTs. In reality the situation is different, as the EMAT mechanism still leaves space for the submission of ALTs and also makes their identification more difficult. In the context of the EMAT mechanism, the “price” of the tender for which the deviation is calculated involves also fictitious Euros that are subtracted from the real price. Those fictitious Euros express the performance of the bidders on the qualitative aspect of the tender. In conclusion, the term “abnormally low” does refer only to the price of a tender.
The difficulties in identifying ALTs introduced by the use of the EMAT mechanism are related to the quantification of the bidders’ performance on the qualitative aspects of a tender. Combining the bidders’ performance on the quality criteria with the price criterion is very demanding and makes the comparative evaluation of bids difficult. The difficulties clients face in quantifying the qualitative aspects of the EMAT, often lead them to attribute very similar scores to all bidders for those criteria. The fact that the EMAT is not applied in a unified way constitutes an obstacle for the development of unified mathematical standards for the identification of ALTs.

The EMAT mechanism is ideal for integrated contracts where the design is put into tender and thus time, quality, innovativeness, the work method etc. need to be evaluated next to the price offered. In order to give the bidders design freedom, the client describes his problem by developing functional requirements for the project. However, functional specifications leave space for misinterpretations both from the client and the contractor. The contractor may “misread” the specifications and submit a tender below cost unintentionally or deliberately.

Integrated contracts create complexities for the identification of ALTs by enhancing the information asymmetry between the client and the bidder(s). Because the detailed design is yet to be prepared, there are differences in the scope determined by the client and the bidders that are reflected in deviations in the cost estimation. In addition, the design solutions of the bidders may differ significantly. The range of price and quality performance offered in the bids is expected to be higher and the comparability of bids lower. Consequently, the effectiveness of relative standards as indicators in the evaluation process, that offer a comparative view over tenders, diminishes.

The introduction of integrated contracts has created difficulties, especially for the client, to estimate the project cost accurately during tendering. In the absence of a detailed design, not enough technical details are known so as to build up the estimate. The cost estimation needs to be done on a higher level of the work breakdown structure where the uncertainty is rather high. In other words, the accuracy of the build-up method that is predominantly used to estimate the cost during tendering has deteriorated. Thus, the effectiveness of the client’s cost estimation as an indicator in the evaluation of tenders has weakened.

Finally, an important parameter in the procurement of integrated contracts is the risk allocation, as most of the risks arise and need to be treated in the design stage. The risk analysis is interrelated with the tender price to be offered. Failing to take into account or underestimating certain risks is a very common path that leads to the submission of abnormally low prices. Consequently, the risk analysis and distribution is a parameter that needs to be examined for the identification of ALTs.

SQ4. In what ways can the procurement processes be improved to facilitate the identification of ALTs?

The cost estimation is of great importance for the evaluation of bids and the transition to integrated contracts had negative implications for its accuracy. Improving the cost estimate is a necessary step towards facilitating the identification of ALTs. In practise, creating an extensive cost reference database would contribute in achieving more accurate estimates. The most important asset for the contracting authorities would be to standardize the cost breakdown, by establishing a common definition of the cost elements and what they involve. The SSK constitutes a model that can be used as a baseline for a widely accepted approach on the cost breakdown.
Establishing a common definition of the cost elements would strengthen the client’s understanding of the prices offered in the bids. On a project basis, this can be achieved by asking for price specifications to be included in the tenders, which would evidently facilitate the identification of ALTs. The question then is, based on which breakdown of the cost should the client ask for specifications? In this context, the meaning of the “breakdown of the cost” goes beyond the definition of what each cost element involves. It refers to the breakdown of cost based on different parts and/or tasks of the project and can only be performed on a project basis. In any case, the level of detail of the specifications should not be excessive, to avoid limiting the bidders’ design freedom.

Another point of weakness in the way procurement processes are organized, the improvement of which would facilitate the identification of ALTs, is related to the EMAT mechanism. The process of quantifying the performance of bidders on qualitative aspects needs to be improved in a unified way. This would allow the contracting authorities to disengage from attributing similar scores to the bidders’ performance on quality criteria, which makes it hard to distinguish if the quality offered is abnormal in relation to the price charged.

Organizing procurement processes efficiently is largely a matter of experience, which needs to be transformed into knowledge and expertise. In order to improve the way in which procurement processes are organized, contracting authorities need to analyze the outcome of previous tenders. In particular, the characteristics of the market(s) in which a client operates should be determined. Having an insight on the efficiency and sensitivity of the market is very assisting in understanding if deviations in the bids should be expected and up to what point they can be attributed to market conditions.

RQ. In what ways can the contracting authorities objectify the detection of ALTs?

The detection of ALTs is a complex problem that requires more than setting mathematical standards in order to be solved. The steps that need to be taken by contracting authorities to deal with ALTs are even more important that the thresholds that may be used to identify such tenders. It is necessary to understand that it is extremely difficult to establish unified mathematical standards in the national law that would be applicable for different markets, different types of projects and different forms of collaboration between clients and contractors. Nevertheless, the main factors to be examined for the detection of ALTs can be described in qualitative terms in the client’s tendering guidelines and specified in the tender documents.

Contracting authorities should set in their tendering guidelines for integrated contracts a non-exhaustive list of factors to be examined for the identification of tenders for which explanation shall be asked. Those factors include the deviation from the cost estimation, the deviation from the mean of the bids and the risk analysis. In addition, it should be stated that an exhaustive list of the factors to be examined will be quantified in the tender documents, taking into account the project context. In order to avoid false statements in the explanation provided in written by the bidder, the binding character of the explanation for the contract realization should be stimulated. Obviously, this refers to the case when the explanation is considered satisfactory by the client. The reason to act on the level of the tendering guidelines is to achieve uniformity in decision making, enhance the transparency of the process and preserve competition.
Even though the quantitative (mathematical) standards to be set on the tender documents need to be context specific, general characteristics can be determined. Initially, both absolute and relative standards should be used depending on the number of bids. Relative standards require a sufficient number of bids for the mean to be a trustworthy indicator. Consequently, the cost estimate should be used as an indicator when few tenders are received, provided that the client has the expertise to prepare a trustful estimate. Above a certain number of bids, the mean of all the bids should be used. Ideally, if an even greater number of bids are received the highest and the lowest should be omitted from the calculation of the mean, so as to avoid outliers’ effects.

Up to a certain deviation, either from the mean of the bids or from the cost estimation, there is ambiguity on whether tenders should be examined. However, above that point it is clear that tenders need to be investigated. Consequently, gradual standards can be established, meaning that the client should decide whether to investigate tenders that deviate less than a certain threshold. Above that threshold, the investigation of tenders should be obligatory. In the former case, the client shall decide on a project-basis whether to ask for explanations from the bidder(s), taking into consideration the risk analysis.

In order to develop an efficient framework for the identification of ALTs, contracting authorities need to conduct research on the standards and the corresponding thresholds. The research should be based on the database of previous tenders in which the client has been involved and the standards need to be fine tuned with the type of project and the market conditions. Based on extensive consultation with legal and cost experts throughout the two rounds of interviews, a framework for the identification of ALTs has been created.

It needs to be made explicitly clear that this constitutes an exemplar of a framework for the detection of ALTs. The only purpose that this exemplar serves is to indicate the main characteristics of a potential framework to be developed and formulate a guideline for further research by contracting authorities. The framework refers to the provisions for the detection of ALTs to be set in the tender documents for DC and DBFM projects in the field of transportation infrastructure, which are procured with the EMAT tender mechanism.

<table>
<thead>
<tr>
<th>Deviation of Tender</th>
<th>Action</th>
<th>Number of bids</th>
<th>Suggested Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 - 35 %</td>
<td>Optional Investigation</td>
<td>&lt; 5</td>
<td>Cost estimation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 - 7</td>
<td>Mean of all bids</td>
</tr>
<tr>
<td>&gt; 35 %</td>
<td>Obligatory Investigation</td>
<td>≥ 7</td>
<td>Mean of the bids excluding the highest and lowest</td>
</tr>
</tbody>
</table>

Lastly, two concluding remarks need to be made. First, the underlying assumption of this research that the detection of ALTs is a step towards economically sustainable procurement has been confirmed, both by case law and the interviewed experts. Moreover, developing an exemplar framework proves the research hypothesis that the problem of identifying ALTs can be dealt with in an objective way through standards. Of course this research does not provide with ready-made solutions. However, it gives tangible suggestions about the steps that need to be taken to cope with the part of the problem concerning the detection of ALTs. Most importantly it provides the necessary information for contracting authorities and the partnering consultancy companies to move towards materializing those suggestions.
8.2. Conclusions

This section presents the main conclusions that can be derived from the results of this research that were presented in the previous section.

- ALTs are currently a problem and have detrimental effects for the realization of projects
- ALTs have the characteristics of an economic problem that requires a legally sound solution
- The identification of ALTs is a step towards economically sustainable procurement
- Integrated contracts make the identification of ALTs more complex
- The problem of identifying ALTs can be dealt with in an objective way through standards
- The only legal duty for the contracting authority is to give the bidder the chance for an effective explanation on the tender before deciding to reject it
- Mathematical standards can only be used to identify tenders for which explanation is needed
- The explanation provided by the bidder is legally binding during project materialization
- Mathematical standards for the detection of ALTs need to be set in the tender documents, to be context specific
- It is essential to describe the standards in qualitative terms and the process for the detection of ALTs in the tendering guidelines, to preserve uniformity and transparency
- Absolute and relative standards can be used in combination, depending on the number of bids and the capability of the contracting authority to substantiate the cost estimation
- Up to a certain deviation there is ambiguity about whether tenders should be examined, but above that point it is undoubtful that investigation is needed

8.3. Recommendations

This section recapitulates some recommendations to be taken into account by contracting authorities and the partnering consultancy companies. Based on the results and conclusions that were discussed in the previous sections it is suggested that contracting authorities should:

- Establish a standardized process for the detection of ALTs in the tendering guidelines, to achieve uniformity in decision making and enhance transparency of the process
- Set context specific mathematical standards for the identifications of ALTs in the tender documents and fine tune those standards with the market conditions
- Stimulate in the tendering guidelines and the tender documents the binding character of the explanation provided by the bidder in the investigation process, to avoid false statements
Communicate to the bidders that the aim of the investigation process is to align the understanding and expectations of the solution offered in a tender.

Ask for price specifications to be included in the bids to facilitate understanding of how the bid price was built up. The level of detail asked should not limit the design freedom.

Work towards developing an extensive database of cost elements by documenting the relevant information provided in previous projects.

Prepare the cost estimate based on the principles of the SSK model and motivate the bidders to do the same, aiming to the establishment of a commonly interpretable cost breakdown.

Analyze the outcome of previous tenders on a market basis, to determine the efficiency and sensitivity of the market.

8.3.1. Limitations and Suggestions for Further Research

The quantitative standards proposed for the detection of ALTs are stemming from the consultation of a limited number of experts and refer to infrastructure projects in general. The most obvious limitation is that mathematical standards, in order to be trustful, need to be derived from an analysis of the results of previous tenders. In terms of this research, it was not possible to have access to an extensive database of tenders due to confidentiality reasons. Moreover, it is doubtful whether within the time frame of a master thesis such an approach would be feasible. Thus, an imperative step further in the research about the detection of ALTs is to conduct a statistical analysis on the results of previous tenders for different markets within the field of infrastructure. Contracting authorities need to elaborate, on a market basis, on the thresholds below which tenders shall be examined.

As it was discussed, there are certain factors making the evaluation of bids complex on which further research is necessary. The price offered in the bid is a focal point in the evaluation process. However, the estimation of cost made by contractors differs in many ways from the clients’ estimate, which makes it difficult to understand how the bid price was built up. Including price specifications in the bids is helpful, but requires a commonly acceptable way of breaking down the cost. Further research needs to focus on two aspects: first, on the establishment of a common definition of the cost elements that could be based on the principles of the SKK2010 model and second, on the breakdown of cost as a basis to request for price specifications in the bids.

Finally, from a theoretical point of view the phenomenon of ALTs leads to inefficiencies in the market, as it is the case with phenomena of dumping encountered in other markets than the infrastructure projects. Consequently, it would be very interesting and value adding to investigate the analogies between the existing legislation on dumping and a potential legal framework to treat ALTs.
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Appendices

Appendix A. Glossary

This glossary explains the meaning of the central concepts used in this thesis, lest these concepts can be used in a consistent and coherent manner. It does not intend to suggest universal definitions of words. Also the Dutch translation of the concepts is given, for Dutch readers (Dreschler, 2009).

**Award**
(Dutch: Gunning): the decision of which tender gets the contract.

**Award mechanism**
(Dutch: Gunningsmechanisme): a mechanism that public clients use to determine their preference for tenders. It has to be known prior to the award phase by the potential suppliers.

**Bid**
(Dutch: Bieding): the legally binding proposal concerning price and performance a supplier submits in a procurement procedure.

**Client**
(Dutch: Klant, vragende partij): a party that needs a construction product and related services, such as design, engineering, execution and maintenance. In this thesis the word is used to differentiate from the more traditional word principal.

**Contractor**
(Dutch: Aannemer): traditional term for the builder of public works and utility buildings. With integrated contracts a contracting party will need to provide more services than construction, such as design and engineering.

**Criterion**
(Dutch: Criterium): an aspect, quantity, product dimension. Please note that in the relevant European regulation (European Parliament 2004) this word refers to the type of award mechanism as well. In this thesis the latter is excluded in order to prevent misinterpretation.

**EMAT**
(Dutch: Economisch Meest Voordelige Inschrijving, EMVI): the tender that, according to the contracting authority, is the best on various criteria linked to the subject-matter of the public contract in question, for example, quality, price, technical merit, aesthetic and function characteristics, environmental characteristics, running costs, cost-effectiveness, after-sales service and technical assistance, delivery date and delivery period or period of completion (European Parliament 2004).

**EMAT mechanism**
(Dutch: EMVI gunningsmechanisme): a mechanism that grades tenders on more criteria than just the price and compliance with the terms of reference.

**Functional specification**
(Dutch: Functionele eis): a requirement that specifies a wanted behavior or performance rather than a wanted solution.

**Integrated contracting**
(Dutch: Geïntegreerd aanbesteden): a way of contracting in which one or more project activities are contractually combined with construction activity.

**Price**
(Dutch: Prijs): the price of a bid is the amount of money a supplier wants to receive for the performance promised in his bid.
**Price correction system** (Dutch: Price correctie systeem): an award mechanism in which optional value is expressed in monetary terms. This optional value then forms a correction on the price of a tender.

**Principal**
(Dutch: Principaal, opdrachtgever): traditional term for the client of public works. With integrated contracts the principal is required to allocate more responsibility towards supplying parties, hence in this thesis the word client or customer is used to indicate the demanding party.

**Procurement**
(Dutch: Aanbesteding): the regulated search and selection process on the supplier market that a public client undertakes in order to fulfill its construction need.

**Selection phase**
(Dutch: Selectiefase): the phase of a procurement in which the suppliers that are eligible for submitting a tender are evaluated and selected.

**Specification**
(Dutch: Specificatie): the meticulous description of either a requirement or a product, based on a criterion.

**Tender**
(Dutch: Aanbieding; inschrijving): the written offer, bid, proposal, promise of a supplier to deliver a product for a certain price, within a certain timeframe, complying with the Program of Requirements.

**Traditional contracts**
(Dutch: Traditionele aanbesteding): the ‘Bid-Build’ task allocation type with accompanying organization and contract forms. UAV/UAR are the administrative conditions and the tender package is made using the RAW methodology. Award is based on the lowest price.

**Works**
(Dutch: Werken): either the execution, or both the design and execution, of works related to one of the activities within the meaning of Annex I (a list of various construction related activities). A ‘work’ means the outcome of building or civil engineering works taken as a whole which is sufficient of itself to fulfil an economic or technical function. (EU Directive 2004: 1.2b)
**Appendix B. List of Abbreviations**

**English abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALT</td>
<td>Abnormally Low Tender</td>
</tr>
<tr>
<td>BOT</td>
<td>Build, Operate, Transfer</td>
</tr>
<tr>
<td>BOOT</td>
<td>Build Own Operate Transfer</td>
</tr>
<tr>
<td>DB</td>
<td>Design Build</td>
</tr>
<tr>
<td>DBFM</td>
<td>Design Build Finance Maintain</td>
</tr>
<tr>
<td>DBFMO</td>
<td>Design Build Finance Maintain Operate</td>
</tr>
<tr>
<td>D&amp;C</td>
<td>Design Construct</td>
</tr>
<tr>
<td>ECJ</td>
<td>European Court of Justice</td>
</tr>
<tr>
<td>EMAT</td>
<td>Economically Most Advantageous Tender (Dutch: EMVI)</td>
</tr>
<tr>
<td>GAO</td>
<td>Government Accountability Office</td>
</tr>
<tr>
<td>LP</td>
<td>Lowest Price</td>
</tr>
<tr>
<td>PPC</td>
<td>Public Private Comparator</td>
</tr>
<tr>
<td>PPP</td>
<td>Public Private Partnership</td>
</tr>
<tr>
<td>SPC</td>
<td>Special Purpose Company</td>
</tr>
<tr>
<td>ToR</td>
<td>Terms of Reference (Dutch: vraagspecificatie; contractvoorwaarden)</td>
</tr>
<tr>
<td>WBS</td>
<td>Work Breakdown Structure</td>
</tr>
</tbody>
</table>

**Dutch abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARW</td>
<td>Aanbestedingsreglement Werken (procurement regulation works)</td>
</tr>
<tr>
<td>CROW</td>
<td>Centrum voor Regelgeving en Onderzoek in de Grond-, Water- en Wegenbouw en de verkeerstechniek (centre for regulation and research in civil engineering)</td>
</tr>
<tr>
<td>EMVI</td>
<td>Economisch Meest Voordelige Inschrijving (see EMAT)</td>
</tr>
<tr>
<td>PIANOo</td>
<td>Professioneel en Innovatief Aanbesteden, Netwerk voor Overheidsopdrachtgevers (a network for supporting government clients in professional and innovative procurement)</td>
</tr>
<tr>
<td>RAW</td>
<td>Rationalisatie en Automatisering in de Grond-, Water- en Wegenbouw (rationalisation en automatisering in civil engineering)</td>
</tr>
<tr>
<td>RWS</td>
<td>Rijkswaterstaat (Dutch directorate-general for public works and water management, contracting agency of VenW)</td>
</tr>
</tbody>
</table>
Appendix C. EU Directive 2004/18/EC


• TITLE I Definitions and general principles (art. 1-3)
• TITLE II Rules on public contracts
  • CHAPTER I General provisions (art. 4-6)
  • CHAPTER II Scope
    ▪ Section 1 — Thresholds (art. 7-9)
    ▪ Section 2 — Specific situations (art. 10-11)
    ▪ Section 3 — Excluded contracts (art. 12-18)
    ▪ Section 4 — Special arrangement (art. 19)
  • CHAPTER III Arrangements for public service contracts (art. 20-22)
  • CHAPTER IV Specific rules governing specifications and contract documents (art. 23-27)
  • CHAPTER V Procedures (art. 28-34)
  • CHAPTER VI Rules on advertising and transparency
    ▪ Section 1 — Publication of notices (art. 35-37)
    ▪ Section 2 — Time limits (art. 38-39)
    ▪ Section 3 — Information content and means of transmission (art. 40-41)
    ▪ Section 4 — Communication (art. 42)
    ▪ Section 5 — Reports (art. 43)
  • CHAPTER VII Conduct of the procedure
    ▪ Section 1 — General provisions (art. 44)
    ▪ Section 2 — Criteria for qualitative selection (art. 45-52)
    ▪ Section 3 — Award of the contract (art. 53-55)
• TITLE III Rules on public works concessions
  • CHAPTER I Rules governing public works concessions (art. 56-61)
  • CHAPTER II Rules on contracts awarded by concessionaires which are contracting authorities (art. 62)
  • CHAPTER III Rules on contracts awarded by concessionaires which are not contracting authorities (art. 63-65)
• TITLE IV Rules governing design contests (art. 66-74)
• TITLE V Statistical obligations, executory powers and final provisions (art. 75-84)
• ANNEXES (I-XII)

C2. European Thresholds

<table>
<thead>
<tr>
<th></th>
<th>Supplies</th>
<th>Services</th>
<th>Works</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entities listed in Schedule 1</td>
<td>(€130,000)</td>
<td>(€130,000)</td>
<td>(€5,000,000)</td>
</tr>
<tr>
<td>Other public sector contracting</td>
<td>(€200,000)</td>
<td>(€200,000)</td>
<td>(€5,000,000)</td>
</tr>
<tr>
<td>Indicative Notices</td>
<td>(€750,000)</td>
<td>(€750,000)</td>
<td>(€5,000,000)</td>
</tr>
<tr>
<td>Small lots</td>
<td>(€80,000)</td>
<td>(€80,000)</td>
<td>(€1,000,000)</td>
</tr>
</tbody>
</table>

Figure 43: Contracts for public works, public supply and public service

* Schedule 1 lists central government bodies subject to the World Trade Organisation's (WTO) Government Procurement Agreement (GPA). These thresholds will also apply to any successor bodies.
C3. Article 53: Contract Award Criteria

1. “Without prejudice to national laws, regulations or administrative provisions concerning the remuneration of certain services, the criteria on which the contracting authorities shall base the award of public contracts shall be either:

(a) when the award is made to the tender most economically advantageous from the point of view of the contracting authority, various criteria linked to the subject-matter of the public contract in question, for example, quality, price, technical merit, aesthetic and functional characteristics, environmental characteristics, running costs, cost-effectiveness, after-sales service and technical assistance, delivery date and delivery period or period of completion, or

(b) the lowest price only.

2. Without prejudice to the provisions of the third subparagraph, in the case referred to in paragraph 1(a) the contracting authority shall specify in the contract notice or in the contract documents or, in the case of a competitive dialogue, in the descriptive document, the relative weighting which it gives to each of the criteria chosen to determine the most economically advantageous tender.

Those weightings can be expressed by providing for a range with an appropriate maximum spread. Where, in the opinion of the contracting authority, weighting is not possible for demonstrable reasons, the contracting authority shall indicate in the contract notice or contract documents or, in the case of a competitive dialogue, in the descriptive document, the criteria in descending order of importance”

C4. Article 55: Abnormally Low Tenders

1. “If, for a given contract, tenders appear to be abnormally low in relation to the goods, works services, the contracting authority shall, before it may reject those tenders, request in writing details of the constituent elements of the tender which it considers relevant. Those details may relate in particular to:

(a) the economics of the construction method, the manufacturing process or the services provided;

(b) the technical solutions chosen and/or any exceptionally favorable conditions available to the tenderer for the execution of the work, for the supply of the goods or services;

(c) the originality of the work, supplies or services proposed by the tenderer;

(d) compliance with the provisions relating to employment protection and working conditions in force at the place where the work, service or supply is to be performed;

(e) the possibility of the tenderer obtaining State aid.

2. The contracting authority shall verify those constituent elements by consulting the tenderer, taking account of the evidence supplied.

3. Where a contracting authority establishes that a tender is abnormally low because the tenderer has obtained State aid, the tender can be rejected on that ground alone only after consultation with the tenderer where the latter is unable to prove, within a sufficient time-limit fixed by the contracting authority, that the aid in question was granted legally. Where the contracting authority rejects a tender in these circumstances, it shall inform the Commission of that fact.”
Appendix D. Case Law on Abnormally Low Tenders

**D1. Amey LG Ltd v Scottish Ministers, Case CA114/12**

[6] “Amey and three other economic operators submitted tenders. On 27 April 2012 the Scottish Ministers wrote to Amey to explain that their evaluation of its financial submission had led them to consider that the offer was abnormally low as it was not economically viable and sustainable. They stated that this presented them with unacceptable financial, operational and reputational risks in fulfilling their statutory duties for the management and maintenance of trunk roads in Scotland…”

[22] “In my view the various expressions, although different, are all directed towards the same broad end, namely that of judging whether the bid is one that is likely to provide the contracting authority with the services which it seeks. Concepts such as reliability, viability and soundness are objective concepts. Seriousness and genuineness have the potential to be subjective; and Amey made much of that in its challenge to which I now turn.”

[42] “It is clear from the affidavits that Amey lodged that its employees put very considerable time and effort into preparing the tenders, that Amey drew on its experience as the contractor in the south west unit and elsewhere in Scotland to create its holistic bid, and that it was confident that it had priced the bid in a viable and sustainable way. But the term “genuine” could cover the genuineness of the economic operator’s schedule of rates and prices, which was the concern that the Scottish Ministers raised in their letter of 27 April 2012. It would have been helpful if the Scottish Ministers had made clear in the decision letter what they meant by saying that the offer was not genuine. But even if their use of the term were incorrect, that would not undermine their conclusions about unacceptable risk, economic viability and sustainability.”

**D2. SAG ELV Slovensko a.s. and others v Úrad pre verejné obstarávanie, Case C-599/10**

[45] “Having regard to all of the foregoing considerations, the answer to the questions referred is that:

– Article 55 of Directive 2004/18 must be interpreted as requiring the inclusion in national legislation of a provision such as Article 42(3) of Law No 25/2006 on public procurement, which, in essence, provides that if a tenderer offers an abnormally low price, the contracting authority must ask it in writing to clarify its price proposal. It is for the national court to ascertain, having regard to all the documents in the file placed before it, whether the request for clarification enabled the tenderer concerned to provide a sufficient explanation of the composition of its tender;

– Article 55 of Directive 2004/18 precludes a contracting authority from taking the view that it is not required to ask a tenderer to clarify an abnormally low price;

– Article 2 of Directive 2004/18 does not preclude a provision of national law, such as Article 42(2) of Law No 25/2006, according to which, in essence, the contracting authority may ask tenderers in writing to clarify their tenders without, however, requesting or accepting any amendment to the tenders. In the exercise of the discretion thus enjoyed by the contracting authority, that authority must treat the various tenderers equally and fairly, in such a way that a request for clarification cannot appear unduly to have favored or disadvantaged the tenderer or tenderers to which the request was addressed, once the procedure for selection of tenders has been completed and in the light of its outcome.”
D3. EVN AG and Wienstrom GmbH v. Republic of Austria, Case C-448/01

[30] “Referring to the lack of clarity of the expression the most economically advantageous tender used in Article 26 of Directive 93/36, the Bundesvergabeamt first asks as a question of principle whether Community law allows the contracting authority to lay down criteria that pursue advantages which cannot be objectively assigned a direct economic value, such as advantages related to the protection of the environment.”

[32] “More specifically, at paragraph 55 of the judgment in Case C-513/99 Concordia Bus Finland [2002] ECR I-7123, the Court held that Article 36(1)(a) of Directive 92/50 cannot be interpreted as meaning that each of the award criteria used by the contracting authority to identify the most economically advantageous tender must necessarily be of a purely economic nature.”

[33] “The Court therefore accepted that where the contracting authority decides to award a contract to the tenderer who submits the most economically advantageous tender it may take into consideration ecological criteria, provided that they are linked to the subject-matter of the contract, do not confer an unrestricted freedom of choice on the authority, are expressly mentioned in the contract documents or the tender notice, and comply with all the fundamental principles of Community law, in particular the principle of non-discrimination ( Concordia Bus Finland, cited above, paragraph 69).”

D4. Morrison Facilities Services Ltd v Norwich CC [2010], Case EWHC 487

[17] “Considering the rival submissions, I have reached the clear conclusion that Morrison has established a serious issue to be tried under this head. In the light of the paragraphs of the judgment of the Court of First Instance of Renco that I have quoted, it does seem to me to be seriously arguable that a contracting authority does come under a duty, when it suspects that there has been an abnormally low tender, to investigate that tender. Moreover, it seems to me to be well arguable that that is a duty that is owed not merely to the low tenderer but to the competing tenderers having regard to the general objectives of the Directive, and in this country the 2006 Regulations, which find their expression in the general obligation contained in Regulation 4(3).”

D5. Belfass SPRL. v. Council of the European Union, Case T-495/04

[29] “The Council, without raising a formal plea of inadmissibility, submits that, to the extent that it relates to Lot No 2, the action against the decision of 13 October 2004 is inadmissible. The applicant does not challenge the decision to exclude it from the tender process, as such, but the lawfulness of the Council’s decision to include the criterion which led to its exclusion, namely the average of the total number of hours proposed by tenderers, in the specifications.”

[30] “At the hearing, the Council stated that it was clear from the case-law of the Court of Justice that a person who considers that the specifications in a call for tenders, as prescribed by decision of the contracting authority, discriminate against him cannot await notification of the decision awarding the contract in question and then challenge it, on the ground specifically that those specifications are discriminatory, without infringing the objectives of speed and effectiveness of Council Directive 89/665/EEC of 21 December 1989 on the coordination of the laws, regulations and administrative provisions relating to the application of review procedures to the award of public supply and public works contracts (OJ 1989 L 395, p. 33), as amended by Directive 92/50 (Case C-230/02 Grossmann Air Service [2004] ECR I-1829, paragraph 37).”
D6. J Varney & Sons Waste Management Ltd v Hertfordshire CC [2010], Case EWHC 1404

[157] “Either way, there is nothing in either provision to support the contention that there is a general duty owed by the authority to investigate so-called “suspect” tenders which appear abnormally low. Nothing in the European Court decisions to which Arnold J refers dictates a different conclusion. In any event, Morrison is only a decision as to what was arguable on an interlocutory basis. Having heard full argument on the point at trial I am quite satisfied that neither the Directive nor the Regulation imposes a duty to investigate so-called suspect tenders generally.”

[158] “It follows that, on the correct interpretation of both the Directive and the Regulation (save in the case of Fourways where the Council did consider the tender abnormally low and was contemplating rejecting the tender at least in part if not totally), the Council was not under a duty generally to investigate so-called “suspect” tenders in circumstances where the Council had no intention of rejecting those tenders. In my judgment, this aspect of Varney’s complaint that the Council was in breach of duty in failing to investigate the tenders other than Fourways fails at the first hurdle.”

D7. PC Ware Information Technologies BV v Commission [2010], Case T-121/08

[72] “In that regard, under the provisions of Article 139(1) of the detailed implementing rules, the contracting authority is obliged to allow the tenderer to clarify, or even explain, the characteristics of its tender before rejecting it, if it considers that a tender is abnormally low. The obligation to check the seriousness of a tender also arises where there are doubts beforehand as to its reliability, also bearing in mind that the main purpose of that article is to enable a tenderer not to be excluded from the procedure without having had an opportunity to explain the terms of its tender which appears abnormally low.”


[53] “It is essential that each tenderer suspected of submitting an abnormally low tender should have the opportunity effectively to state his point of view in that respect, giving him the opportunity to supply all explanations as to the various elements of his tender at a time - necessarily after the opening of all the envelopes - when he is aware not only of the anomaly threshold applicable to the contract in question and of the fact that his tender has appeared abnormally low, but also of the precise points which have raised questions on the part of the contracting authority.”

[55] “It is apparent from the very wording of that provision, drafted in imperative terms, that the contracting authority is under a duty, first, to identify suspect tenders, secondly to allow the undertakings concerned to demonstrate their genuineness by asking them to provide the details which it considers appropriate, thirdly to assess the merits of the explanations provided by the persons concerned, and, fourthly, to take a decision as to whether to admit or reject those tenders. It is therefore not possible to regard the requirements inherent in the inter partes nature of the procedure for examining abnormally low tenders, within the meaning of Article 30(4) of the Directive, as having been complied with unless all the steps thus described have been successively accomplished.”

[67] “As regards the second rule referred to in paragraph 60 of this judgment, it is undisputed that the Directive does not define the concept of an abnormally low tender and, a fortiori, does not determine the method of calculating an anomaly threshold. That is therefore a task for the individual Member States.”
D9. SECAP SpA v Comune di Torino, Case C-147/06

[24] “Consequently, that rule, which is formulated in clear, imperative and absolute terms, deprives tenderers who have submitted abnormally low bids of the opportunity to demonstrate that those bids are viable and genuine. That aspect of the legislation at issue in the main proceedings could have consequences incompatible with Community law if, in view of its particular characteristics, a given contract is likely to be of certain cross-border interest and therefore attract operators from other Member States. A works contract could, for example, be of such cross-border interest because of its estimated value in conjunction with its technical complexity or the fact that the works are to be located in a place which is likely to attract the interest of foreign operators.”

[26] “Indeed, the application of the rule requiring the automatic exclusion of tenders considered to be abnormally low to contracts of certain cross-border interest may constitute indirect discrimination since, in practice, it places at a disadvantage operators from other Member States which, as they have different cost structures, may benefit from significant economies of scale or, intending to cut their profit margins in order to enter the market in question more effectively, would be in a position to make a bid that was competitive and at the same time genuine and viable but which the contracting authority would not be able to consider as a result of that legislation.”

[29] “By applying such legislation to contracts of certain cross-border interest, the contracting authorities, lacking any power to assess the soundness and viability of abnormally low tenders, cannot comply with their obligation to observe the fundamental rules of the Treaty on freedom of movement or the general principle of non-discrimination, as required by the case-law of the Court cited at paragraph 20 above. It is also contrary to the contracting authorities’ own interests for them to be deprived of such power, since they are not able to assess tenders which are submitted to them under conditions of effective competition and therefore to award the contract by applying the criteria, which are also laid down in the public interest, of the lowest price or the most economically advantageous tender.”


[76] “In that regard, the Court observes that, although Article 30(4) of Directive 93/37 does not require the Council to check each price quoted in each tender, it must examine the reliability and seriousness of the tenders which it considers to be generally suspect, which necessarily means that it must ask, if appropriate, for details of the individual prices which seem suspect to it, a fortiori when there are many of them. Furthermore, the fact that the applicant’s tender was considered to conform to the contract documents did not relieve the Council of its obligation, under the same article, to check the prices of a tender if doubts arose as to their reliability during the examination of the tenders and after the initial assessment of their conformity.”
Appendix E. Proposal for a new EU Directive on public procurement


1. “Contracting authorities shall require economic operators to explain the price or costs charged, where all of the following conditions are fulfilled:

(a) the price or cost charged is more than 50 % lower than the average price or costs of the remaining tenders

(b) the price or cost charged is more than 20 % lower than the price or costs of the second lowest tender;

(c) at least five tenders have been submitted.

2. Where tenders appear to be abnormally low for other reasons, contracting authorities may also request such explanations.

3. The explanations referred to in paragraphs 1 and 2 may in particular relate to:

(a) the economics of the construction method, the manufacturing process or the services provided;

(b) the technical solutions chosen or any exceptionally favorable conditions available to the tenderer for the execution of the work or for the supply of the goods or services;

(c) the originality of the work, supplies or services proposed by the tenderer;

(d) compliance, at least in an equivalent manner, with obligations established by Union legislation in the field of social and labour law or environmental law or of the international social and environmental law provisions listed in Annex XI or, where not applicable, with other provisions ensuring an equivalent level of protection;

(e) the possibility of the tenderer obtaining State aid.

4. The contracting authority shall verify the information provided by consulting the tenderer. It may only reject the tender where the evidence does not justify the low level of price or costs charged, taking into account the elements referred to in paragraph 3.

Contracting authorities shall reject the tender, where they have established that the tender is abnormally low because it does not comply with obligations established by Union legislation in the field of social and labour law or environmental law or by the international social and environmental law provisions listed in Annex XI.

5. Where a contracting authority establishes that a tender is abnormally low because the tenderer has obtained State aid, the tender may be rejected on that ground alone only after consultation with the tenderer where the latter is unable to prove, within a sufficient time limit fixed by the contracting authority, that the aid in question was compatible with the internal market within the meaning of Article 107 of the Treaty. Where the contracting authority rejects a tender in those circumstances, it shall inform the Commission thereof.

6. Upon request, Member States shall make available to other Member States, in accordance with Article 88, any information relating to the evidence and documents produced in relation to details listed in paragraph 3.”

1. “Where tenders appear to be abnormally low in relation to the works, supplies or services, the contracting authority may require, or be obliged by a Member State to [...] require, economic operators to explain the price or costs proposed in the tender.

2. The explanations referred to in paragraph 1 may in particular relate to:

(a) the economics of the construction method, the manufacturing process or the services provided;

(b) the technical solutions chosen or any exceptionally favorable conditions available to the tenderer for the execution of the work or for the supply of the goods or services;

(c) the originality of the work, supplies or services proposed by the tenderer;

(d) compliance with obligations established by Union legislation in the field of social and labour law or environmental law or of the international social and environmental law provisions listed in Annex XI or, where not applicable, with other provisions ensuring an equivalent level of protection;

(e) the possibility of the tenderer obtaining State aid.

3. The contracting authority shall assess the information provided by consulting the tenderer. It may only reject the tender where the evidence supplied does not satisfactorily account for the low level of price or costs proposed, taking into account the elements referred to in paragraph 2.

Contracting authorities shall reject the tender, where they have established that the tender is abnormally low because it does not comply with applicable obligations established by Union law or national law compatible with it in the field of social and labour law or environmental law or by the international social and environmental law provisions listed in Annex XI.

4. Where a contracting authority establishes that a tender is abnormally low because the tenderer has obtained State aid, the tender may be rejected on that ground alone only after consultation with the tenderer where the latter is unable to prove, within a sufficient time limit fixed by the contracting authority, that the aid in question was compatible with the internal market within the meaning of Article 107 of the Treaty. Where the contracting authority rejects a tender in those circumstances, it shall inform the Commission thereof.

5. Upon request, Member States shall make available to other Member States by way of administrative cooperation any information at its disposal, such as laws, regulations, universally applicable collective agreements or national technical standards, relating to the evidence and documents produced in relation to details listed in paragraph 2.”
## Appendix F. National Legislations of the 27 EU Members on Abnormally Low Tenders

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<tr>
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<td><a href="http://www.kkv.se/upload/Filer/ENG/Publications/Swedish_Public_Procurement_Act.pdf">http://www.kkv.se/upload/Filer/ENG/Publications/Swedish_Public_Procurement_Act.pdf</a></td>
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Figure 44: Sources of the National legislation of the 27 EU Members on ALTs
Appendix G. SSK2010
The SSK is a standard system for creating cost estimates in the civil engineering sector and a guide for cost management. It can be used in all project stages and thus the input can be based on a build-up approach, analogies or parametric design. The newest version of the spreadsheet and the manual is SSK 2010 (Figure 46). The SSK 2010 manual provides the format of the system, consisting of a matrix to fill in the different costs and risks complemented with the definition of several notions used in the cost estimation. In other words, the way of preparing or “reading” a cost estimate created with the SSK 2010 is described.

The SSK 2010 is a probabilistic method to estimate cost, which uses Monte Carlo simulations. The inputs for the simulations are the minimum & maximum cost and the corresponding risk for each element (part) of a project. The distribution of costs generally used is triangular. The output of the Monte-Carlo simulation is a Gauss curve reflecting the average estimated cost along with the potential deviation with respect to the risks included (Figure 45). The different alternatives about completing the project with a certain cost are defined and communicated to the client. Based on this information the client decides on a set of estimated budget and risks (CROW, 2010).

The SSK 2010 is aimed to be used by clients, contractors and/or consultants, but in reality the situation is different. The application of the SSK by contracting authorities is very common on a national level. However, local authorities only lately started to make use of it. In general, the SSK is not used extensively neither by contractors. This happens mostly in cases of large projects that are organized by clients on a national level. One of the main reasons why the SSK is not adapted by contractors is that it is not compatible with the estimation practises they use.
Figure 46: Summary project estimate in SSK2010 (CROW, 2010)
Appendix H. Interviews

**H1. List of Participants**

<table>
<thead>
<tr>
<th>#</th>
<th>Respondent</th>
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<th>Expertise</th>
<th>Location</th>
<th>Date</th>
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<td>Tsong Ho Chen</td>
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<td>Leiden</td>
<td>07/06/2013</td>
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<td>2</td>
<td>Andrea Chao</td>
<td>Allen &amp; Overy</td>
<td>Legal</td>
<td>Amsterdam</td>
<td>11/06/2013</td>
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<td>Den Haag</td>
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<td>Pels Rijcken &amp; Droogleever Fortuijn</td>
<td>Legal</td>
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<td>6</td>
<td>Reyer C. Will *</td>
<td>APM Terminals Management BV</td>
<td>Cost</td>
<td>Den Haag</td>
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<td>7</td>
<td>Kees Vermeij</td>
<td>Ballast Nedam</td>
<td>Cost</td>
<td>Nieuwegein</td>
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<td>8</td>
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<td>Ministerie van Economische Zaken</td>
<td>Legal</td>
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<td>Maasdam Broers Fischer Advocaten</td>
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</table>

*Figure 47: List of interviews with legal and cost experts*
* This participant is chartered by DACE as a cost expert in the procurement of infrastructure projects. In practice, the interviewed is involved with tendering in the private sector and not the public sector. For reasons of research consistency the answers provided are omitted, apart from the quantitative information on questions 1 and 3.

** This participant was contacted through email and the answers provided express the official view of FIEC on ALTs and not personal insight on the research subject. For reasons of research consistency the answers provided are omitted, otherwise anonymity could not be preserved as the answers evidently indicate the participant’s identity.

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<thead>
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<th>#</th>
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Figure 48: List of interviews conducted in terms of the preliminary research
Duty of the contracting authority to investigate and/or reject abnormally low tenders

Based on the latest case on the European Court of Justice regarding ALTS, SAG ELV Slovensko a.s. (C-599/10), it seems that there is a duty for the contracting authority to investigate ALTs by asking the contractor for an explanation on specific points of his bid.

1. Taking into account that there is no definition of what constitutes an abnormally low bid, is there a duty for the contracting authority to investigate ALTs? Notice that the Slovensko case took place in Slovakia where the national procurement legislation does not provide any thresholds for the identification of ALTs.

Answers
All ten participants responded that it is not a duty but only a right of the contacting authority to investigate, even if a tender has raised suspicions.

Comments
All ten participants commented that the only duty that exists for the client is to investigate a suspicious tender before deciding on whether to reject it.

Three participants commented that the explanation provided in written by the contractor becomes part of the offer.

Three participants commented that contractors may appeal in court against the client for not examining the lowest tender for abnormalities but achieving to challenge the decision is difficult.

One participant commented that the right to investigate tenders gives the chance to avoid misunderstandings of the contract conditions or specifications by the contractor, which could create ground for abnormally low tenders.

2. If the explanation provided in due time by the contractor does not satisfy the contracting authority, is there a duty to reject the tender?

Answers
All ten participants responded that it is not a duty but only a right of the contracting authority to reject a tender for which the explanation provided by the contractor in written was not satisfactory.

Comments
Three participants commented that the case of illegal Stated Aid or of a breach of environmental or social legislation constitute an exception.

One participant commented that whether a bid will be rejected if it has raised suspicions depends on the contractor’s financial status.

One participant commented that external advisors can be members of the tender team to evaluate the explanations provided for objectivity reasons.
3. **Otherwise, is the contracting authority allowed to offer the contractor the chance to make alterations in his bid?**

**Answers**
All ten participants responded that the contractor is not allowed to make alterations in his bid because it would constitute a breach of the equality principle.

**Comments**
Five participants commented that in practice it may happen that changes are allowed to a limited extent. However, it is not possible to end up with a “new” bid or harm the competition.

**The procedure to identify and/or reject ALTs**
As it was first ruled by the ECJ in the case of Impresa Lombardini SpA [2001] ECR I-9233 C-285/99, the use of automatic formulas (i.e. anomaly thresholds) for the identification of ALTs is permissible. As aforementioned, tenders identified as abnormally low cannot be rejected automatically but first explanation needs to be asked from the contractor.

4. **The automatic formula needs to be established in the national procurement legislation to be permissible or can it be prescribed for each specific tender procedure?**

**Answers**
All ten participants responded that the use of a mathematical formula for the identification of tenders for which explanation needs to be asked from the contractor is permissible and can be established either by national law or in the tender documents.

**Comments**
Three participants commented that it is better to establish the formula in the tender documents so as to take into account the project content and context. Two of them added that legislation can prescribe general standards however those should not be binding.

One participant commented that the formula can be established in the Gids Proportionaliteit which involves legal provisions that are not binding.

One participant commented that the formula can be used as an “internal instrument”, as the contracting authority always has the right to investigate tenders.

5. **In the second case, the automatic formula should be prescribed in the documentation describing the award phase?**

**Answers**
Nine participants responded that a mathematical formula should be prescribed in the award documents.

One participant responded that the formula should be known as early as possible, to preserve competition and enhance transparency. Thus he suggested setting standards before the tender stage, in the tendering guidelines of the client.

**Comments**
Two participants commented that in essence the formula would constitute an extra award criterion.
EU commission proposes to use relative standards for the identification of abnormally low tenders

The EU Commission in the proposal for a new Directive on public procurement proposes the establishment of certain anomaly thresholds for the identification of ALTs. A prerequisite for the application of those thresholds is that at least 5 bids are submitted.

6. This number of 5 bids seems to refer to the award phase of a tender and not to the selection phase (pre-qualification phase). However in many cases e.g. in the competitive dialogue, the number of tenderers in the award phase is limited down to 3 (most often). Even though theoretically the higher the number of bids, the more competitive a tender process and thus the higher the possibility of receiving ALTs, still the number of bids does not affect whether a tender itself is abnormally low or not. Should this requirement for a certain number of bids exist in the legislation?

Answers
Six participants responded that the requirement for a certain number of tenders is not necessary from a legal perspective, as the client always has the right to investigate tenders.

Three participants suggested not setting a minimum number of tender as a requirement for the applicability of standards.

Two participants suggested setting a minimum number of tenders as a requirement for the applicability of standards.

Comments
Six participants responded that the requirement for a certain number of tenders is not necessary from a legal perspective, as the client always has the right to investigate tenders.

Three participants suggested not setting a minimum number of tender as a requirement for the applicability of standards.

Two participants suggested setting a minimum number of tenders as a requirement for the applicability of standards.

7. What percentage of deviation from the mean of the other bids and/or from the second lowest bid, would you suggest as an anomaly threshold?

Answers
Six participants gave no answer to this question.

Four out of ten participants suggested a bandwidth of percentage deviation to be used as a standard, depending on the type and condition of the market. The average of the responses is 37.5%, while the total bandwidth of the responses is 20-50%.

The prospect of using absolute standards as anomaly thresholds
The EU commission in its proposal, as well as the EU members that have set thresholds for the identification of ALTs opt for relative standards i.e. deviation from the other bids. Another approach would be to set absolute standards i.e. deviation from some short of cost estimation performed by the contracting authority.
8. If the deviation from the cost estimation is set as a threshold for the identification of ALTs, would this result in a transfer of liability to the contracting authority for the cost estimation? Is it legally sound to use the cost estimation as a standard?

**Answers**

All ten participants responded that there is no transfer of liability to the client if the cost estimation is used as an indicator, as the contractor is obliged to submit a realistic offer.

**Comments**

Five participants commented that juridical consequences do not come with standards for the identification of abnormally low tenders, but only with the argumentation on the client’s decision on whether to reject a tender.

Three participants commented that the contractor is responsible for the tasks, quantities and prices included in his tender.

9. What percentage of deviation from the cost estimation of the contracting authority would you suggest as an anomaly threshold?

**Answers**

Seven participants gave no answer to this question.

Three participants suggested a bandwidth of percentage deviation to be used as a standard. The average of the responses is 32%, while the total bandwidth of the responses is 20-50%.

One of those participants suggested a deviation of 20% when the cost is estimated based on market economics and 30% when the cost calculation is based on business economics.

10. Based on the research, it seems that in practice contracting authorities tend to use internally the deviation from their cost estimation (absolute standard) as an indicator that further examination of a tender is needed for the possibility of abnormalities. However, the national procurement legislations of the 27 EU members that provide thresholds to identify ALTs, as well as the EU commission’s proposal, make extensive use of the deviation from the mean of the other bids (relative standard). What would you comment about this controversy?

**Answers**

Eight participants responded that using the cost estimate as a legally established standard is difficult. The participants gave different arguments:

- Four participants argued that in order to set the cost estimation as a standard the contracting authority has to be able to substantiate and argue on its cost estimate.
- One participant argued that in order to set the cost estimation as a standard there should be a commonly acceptable way of estimating the cost which in reality is very difficult.
- One participant argued that the cost estimation is interrelated with setting the project budget which might be influenced by political institutions.
- One participant argued that if the cost estimate is wrong, then the standard is also wrong.
- One participant argued that the cost estimation is case specific.

Four participants responded that the legislation is making use of relative standards because they reflect market conditions.
Open Discussion

Suggestions

- Three participants suggested using absolute standards, because relative standards create space for manipulation.
- Two participants suggested using relative standards, because they reflect the market conditions which are influential in tendering.
- One participant suggested using both methods. When the number of tenders is sufficient relative standards are preferable. Otherwise, the client has to make use of his cost estimate, provided that he has good knowledge of the market.
- Four participants suggested setting mathematical standards for the identification of abnormally low tenders, based on different arguments:
  - Two participants argued that they can make the process of deciding whether to investigate which tenders to run quicker and with higher uniformity especially for big contracting authorities.
  - One participant argued that they would stimulate contractors’ performance.
  - One participant argued that even if the contractors adapt to standards by avoid submitting bids that deviate more than the thresholds, the implications for the project are positive. The contractor will have raised his bid in a level that better serves the smooth project materialization.
- Three participants suggested not setting mathematical standards for the identification of abnormally low tenders, based on different arguments:
  - The client cannot be certain about the accuracy of the cost estimation and mathematical standards cannot examine the internal consistency of bids.
  - Mathematical standards would put a lot of extra burden for the client during tendering.
  - Abnormally low tenders are a typical case law issue.
- Two participants suggested establishing in the tender documents, in qualitative terms, a non-exhaustive list of factors including the cost estimate, the mean of the bids, etc. to be examined for the identification of abnormally low tenders.
- Two participants suggested asking for price specifications to be included in the bids.
- One participant suggested applying standards in certain projects where the client has limited expertise or projects with high public exposure, sensitivity in environmental or social aspects, etc.
- One participant suggested requiring the tenderers to sign a declaration that they will not bid below cost. Also, clients shall state in the tender documents that bids below cost will be rejected.
- One participant suggested making more extensive use of the Best Value Procurement approach, which facilitates the distribution of risks between client and contractor during tendering.
Comments

- Four participants commented that integrated contracts make cost estimation much more complex for the contracting authority as the project is yet to be designed and thus the scope for which the cost is calculated is uncertain.

- Four participants commented that the cost estimate of the client lags behind in incorporating changes in the market conditions.

- Four participants commented that relative standards leave space for manipulation.

- One participant commented that the (mathematical) standards need to be different for different markets, depending on how competitive is each.

- One participant commented that if the deviation of the bid(s) from the cost estimation is severe then the contracting authority needs to re-examine the scope for which the cost was estimated.

- One participant commented that clients cannot exclude the possibility of cost escalation, extra works and conflicts if awarding the contract to any tender and thus tend to choose the lowest.

- One participant commented that contracting authorities often implement the EMVI mechanism in a way that the price criterion is dominant.

- One participant commented that the time spent in the tendering phase is disproportionally short and the contracting authorities’ approach is often characterized by pennywise thinking. Even though clients do not always possess the knowledge to manage a tender process, they are reluctant to consult external advisors.
**H3. 1st Round: Cost Experts**

**EU commission proposes to use relative standards for the identification of abnormally low tenders**

The EU Commission in the proposal for a new Directive on public procurement proposes the establishment of certain anomaly thresholds for the identification of ALTs, based on the deviation from the mean of the other bids.

1. What percentage of deviation from the mean of the other bids would you suggest as an anomaly threshold?

**Answers**

Three participants gave no answer, neither for DC nor for DBFM contracts.

**DC contracts:** Eight participants gave an answer.

The average of the responses is 25% and the bandwidth is 15-35%.

**DBFM contracts:** Four participants suggested the same deviation with DC contracts.

Three participants suggested that the deviation should be different than in DC contracts. They did not quantify the difference but instead commented that:

- The deviation should be less, since the life cycle costs are taken into consideration and thus the contractor has less space for adjustments in his tender.
- The deviation should be higher because of the finance part.
- The distribution of the cost per element is not known and thus it is difficult to compare costs on a technical level.

One participant suggested a deviation of 20%, arguing that the F part adds an extra 5-10% than DC contracts, depending on the duration of the concession period and the time of the first payment.

**The prospect of using absolute standards as anomaly thresholds**

The EU commission in its proposal, as well as the EU members that have set thresholds for the identification of ALTs opt for relative standards i.e. deviation from the other bids. Another approach would be to set absolute standards i.e. deviation from some short of cost estimation performed by the contracting authority.

2. What percentage of deviation from the cost estimation of the contracting authority would you suggest as an anomaly threshold?

**Answers**

Three participants gave no answer, neither for DC nor for DBFM contracts.

**DC contracts:** Eight participants gave an answer.

The average of the responses is 20% and the bandwidth is 15-35%.

**DBFM contracts:** Six participants suggested the same deviation with DC contracts.

Two clarified that only the realization costs should be taken into account.

Two participants suggested that the deviation should be different that in DC contracts. They did not quantify the difference but instead commented that:

- The deviation should be less, since the life cycle costs are taken into consideration and thus the contractor has less space for adjustments in his tender.
- The deviation should be higher because of the finance part.
3. Based on the research, it seems that in practice contracting authorities tend to use internally the deviation from their cost estimation (absolute standard) as an indicator that further examination of a tender is needed for the possibility of abnormalities. However, the national procurement legislations of the 27 EU members that provide thresholds to identify ALTs, as well as the EU commission’s proposal, make extensive use of the deviation from the mean of the other bids (relative standard). What would you comment about this controversy?

**Answers**
Six participants responded that using the cost estimate as a standard is difficult. The participants gave different arguments for their statement, specifically:

- Three participants argued that estimating the cost is a very complex process.
- The cost estimates made by the client and the contractor differ in many ways.
- The way to estimate cost is company specific and thus deviations are to be expected.
- In some cases there may be a risk of manipulation of the cost estimation of the contracting authority for political reasons, as it is interrelated with setting the budget.

Five participants gave no answer.

4. **Would you suggest using the deviation from the cost estimation as a standard (absolute standard) or the deviation from the mean of the other bids (relative standard)?**

**Answers**
Five participants suggested using the cost estimate as a standard. Different comments complemented this suggestion, specifically:

- Two participants commented that using the cost estimate is the correct approach however it requires the cost estimated to be trustful.
- Two participants commented that the reason to opt for the cost estimate is that they trust the cost estimate knowing how it is build up and what the weak points of this estimate are.
- One participant commented that the use of relative standards can create space for manipulation of the tender process.

Three participants suggested using relative standards.

Three participants suggest using both absolute and relative standards. Different comments complemented this suggestion, specifically:

- One participant commented that the mean of the bids expresses the market conditions, while the cost estimate expresses a fair price for a project. The deviation of the two can be an indicator of the market sanity and competitiveness.
- One participant commented that the use of relative standards solely, can create space for the manipulation of the tender process.
- One participant commented that is in favour of the cost estimate if the contracting authority has expertise on the type of project. Otherwise, if the contracting authority cannot evaluate the cost estimate then the mean of the bids is a better indicator.
Technical details about the methods to identify abnormally low tenders

5. Does the calculation of the mean include the lowest bids too?

Answers

All eleven participants responded that the calculation of the mean of the bids involves the lowest bid.

Comments

Four participants commented that in order to have a more accurate calculation of the mean, if a sufficient number of bids are submitted, the lowest and the highest bids should be excluded from the calculation.

6. In some of the legal provisions involving relative standards, the deviation from the mean of the bids is complemented by the deviation from the 2nd lowest bid as a standard. Would you suggest incorporating this complementary standard? If yes, then what percentage of deviation from the 2nd lowest bid would you suggest as an anomaly threshold?

Answers

Eight participants would not suggest using the deviation from the second lowest bid as an indicator, solely or complementary.

Three participants gave no answer.

Comments

Three participants commented that the deviation from the second lowest bid is an indicator that can be easily manipulated.

Open Discussion

Suggestions

- Two participants suggested to work towards improving the cost estimation by standardizing the breakdown of the cost. A major problem is the absence of a common definition of the different parts of a cost estimate which needs to be established.
- Two participants suggested asking for price specifications in the tender documents so as to facilitate the evaluation and comparison of cost estimates.
- Two participants suggested examining the risk distribution in the process of identifying ALTs.
- Two of the participants suggested following an approach based more on value engineering during tendering.
- One participant suggested preparing the tender documents but not distributing them to the contractors. First, a panel of experts should act as a “fictitious contractor” and submit a bid that would be used as a reference during tender evaluation.
- One participant suggested using absolute standards so as to decide on whether to investigate the process of quantifying quality in the EMAT award mechanism.
- One participant suggested using the ratio between maintenance costs and total costs, as well as the life cycle costs as EMAT criteria, both for DC and DBFM contracts.
- Three participants would not suggest to legally establish mathematical standards for the identification of ALTs. Two arguments complemented this suggestion:
  - The contractors would adjust their bids in the standards which would be known in advance and the standards cannot examine the internal consistency of bids.
  - Mathematical standards can be used as an “internal instrument”.

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Comments

- Seven participants commented that integrated contracts make cost estimation much more complex for the contracting authority as the project is yet to be designed and thus the scope for which the cost is calculated is uncertain.

- Four participants commented that if the deviation of the bid(s) from the cost estimation is severe then the contracting authority needs to re-examine the scope for which the cost was estimated.

- One participant commented that if the deviation of the lowest tender(s) is severe then the contract formulation needs to be re-examined by the client. The contractor(s) may have encountered space for misinterpretation of the contract in a way that lower costs are charged initially, so as to win the contract and then charge for extra work during project materialization.

- One participant commented that functional specifications leave ground for misinterpretations both for the contractor and for the client. Asking for explanations on the bid means that the client has to take responsibility for uncertain information that may not be perfectly able to assess.

- Two participants commented that an extensive cost reference database is required in order to improve the accuracy of the cost estimate.

- One participant commented that clients in order to build a cost reference database ask the contractor for information about the cost elements, but after the contract has been awarded to avoid taking responsibility for possessing this information.

- Two participants commented that the aim when preparing a cost estimate for the client is to calculate an amount that is close to the average of the bids. There are three factors of influence in this process, the scope alignment, the risk distribution and the revenues to be calculated.

- One participant commented that clients make more use of a parametric approach on cost estimation, while contractors use analogies. The reason is that the clients have access to a bigger database, since for each project they receive multiple bids. However, contractors have much more extensive and accurate information on similar projects.

- One participant commented that clients calculate the total project costs, which involve contract and non-contract costs. There are costs to be incurred by the client that are not calculated by the contractor as they are not part of the contract and thus not included in the bid price.

- One participant commented that clients calculate the cost based on a build-up approach, while contractors follow a top-down approach and take into account the market conditions. Contractors may lower the cost in their offer so as to win the tender and ensure continuity in their work.

- One participant commented that clients make conservative cost estimations based on a reference design, because if the cost estimate is low then in the long term there is a risk of insufficient budget being allocated to the project.

- One participant commented that clients calculate the cost based on business economics (bedrijfseconomisch) that do not take into account market conditions. It would be interesting to use market economics to estimate the cost, as contractors do and evaluate tenders based on this estimate, but it is risky because it could lead to the reservation of insufficient budget for the project.
• One participant commented that the breakdown of cost can be based on the works to be performed by different subcontractors or based on the parts of the project financed by different parties. The critical point is to achieve a balance on how detailed price specifications the client asks for, so as not to limit the design freedom of the contractor.

• One participant commented that the maintenance (M) is a small part of the materialization costs and does not add significantly to the deviation of tenders, but the finance (F) part has a high impact.

• One participant commented that the design (D) is small part of the costs and has a low impact on the deviation, while the build (B) part of the cost if significant and any inaccuracies are influential. The insight of clients on those parts is higher that in the maintenance (M) part, as in it interrelated with the distribution of risks which is uncertain in integrated contracts. Moreover, insight on the finance (F) part, which is relative influential, requires a specialization in financial issues.

• Two participants commented that clients cannot exclude the possibility of cost escalation, extra works and conflicts if awarding the contract to any tender and thus tend to choose the lowest.

• One participant commented that when a very low tender is selected then the contracting authority should be prepared to spend more money on supervision.

• One participant commented that if the contracting authorities always opt for the lowest price, in the longer term this would lead to a monopoly.

• Two participants commented that the EMAT mechanism would contribute in avoiding ALTs. However, the process of quantifying the quality aspects is very complex and is not done in a unified way which makes the identification of abnormally low tenders even more difficult.

• Two participants commented that contracting authorities often implement the EMAT mechanism in a way that the price criterion is dominant.

• Three participants commented that it is important to avoid disputes between the contracting authority and the contractor, which requires expectations of the two sides to be aligned and client’s requirements to be clear.

• One participant commented that the time spent in tendering is disproportionally short.

• One participant commented that using the past performance as an indicator is interesting in theory but problematic in practise. The reason is that it is difficult to evaluate past performance objectively and at the same time it is under question how the new entries should be scored.

• One participant commented that there is a method that awards the tender to the bid closest to the mean, after having excluded the highest and lowest bids, which could be used to avoid ALTs.
H4. 2nd Round: Legal Experts

1. Do you consider yourself working on:
   - The client’s side
   - The contractor’s side
   - or both sides?

   **Answers**
   Five participants responded that they work on the client’s side.
   Three participants responded that they work on both sides.
   One participant responded that works on the contractor’s side.

2. In order to identify abnormally low tenders would you suggest using:
   - Quantitative standards, i.e. establish mathematical standards or
   - Qualitative standards, i.e. establish a list of factors to be examined – including the deviation from the cost estimation, the deviation from the mean of the bids, risk analysis, etc. - only in qualitative terms?

   **Answers**
   Four participants suggested establishing qualitative standards.
   Three participants suggested establishing both types of standards.
   One participant suggested establishing quantitative standards.
   One participant gave no answer.

3. Would you suggest setting those standards:
   - In the national law
   - In the national law as provisions to be implement unless the client argues about not using them
   - or in the tender documents?

   **Answers**
   Six participants suggested setting the standards in the tender documents to make them context specific.
   Two participants suggested setting the standards in national law as suggestions.
   One participant suggested setting the standards in the national law.
Comments
One participant commented that setting standards in the tender documents give the opportunity to fine-tune the standards in accordance with the market conditions.

One participant commented that in the interest of legal certainty, equal treatment and transparency standards should best be set in national law.

One participant commented that the national law would be a very restrictive option, while the tender documents on the contrary would allow clients to follow an “amateurish” approach.

One participant commented that in order to preserve competition and transparency of tender processes the standards should be set in the tendering guidelines of the client.

4. If mathematical standards would be set for the identification of abnormally low tenders for which explanations should be asked from the contractor, would you suggest using:
   - The deviation from the cost estimation (absolute)
   - The deviation from the mean of the other bids (relative)
   - or both?

Answers
Four participants suggested using both standards.
Four participants suggested using relative standards.
One participant suggested using absolute standards.

5. In case the client is suspicious of a tender being abnormally low explanations on the bid may be asked from the contractor. Is the explanation provided in writing legally binding and in what way? Does it become part of the contract documents?

Answers
Six participants responded that the explanation provided by the contractor is legally binding.
Three participants responded that the explanation provided by the contractor is not legally binding.

Comments
One participant commented that the explanation is legally binding – like a verbal agreement – and becomes part of the contract – like the notifications (Q&A) during tendering.

One participant commented that the explanation is binding and must become part of the contract, if not it would incite false statements. The binding character of the explanation must be expressly stipulated either in national law or in the tender documents.

One participant commented that the explanation is binding for the realization of the contract. Whether or not it becomes part of the contract documents is irrelevant.

Two participants commented that explanation is not necessarily legally binding and that the bid is what counts to formulate the Economically Most Advantageous Tender.
6. Based on the outcome of the first round of interviews, it seems that the use of integrated contracts makes the identification of abnormally low tenders more complex, do you agree?

**Answers**

Seven participants agreed.

Two participants did not agree.

7. Do you believe that an analysis - for each market (e.g. rail projects) - of the outcome of previous project tenders would assist in improving the way procurement processes are organized, by focusing on the characteristics of the market (e.g. efficiency, sensitivity)?

**Answers**

All nine participants responded positively.

8. Do you consider the identification of ALTs as a step towards the direction of economically sustainable procurement?

**Answers**

Six participants responded positively.

Three participants responded negatively.

**Comments**

One participant commented that ALTs are contrary to embracing sustainable procurement, as sustainability elements “have their price”.

One participant commented that it would not contribute directly because economically sustainable procurement is a ‘catch-all phrase’ so it is hard to determine a relation without narrowing this concept.

One participant commented that it depends on the point of view. From the contractors’ perspective economic sustainability refers to the existence of a margin for profit. However, it is up to the contractor to decide whether he is willing to be bound to make loss out of a project. From the perspective of the client that aims to have a project materialized in accordance with the contract conditions, a proactive identification of ALTs is a step towards economic sustainability of tendering.

One participant suggested that contractors should have the chance to withdraw their tender if the investigation proves the tender to be abnormally low. The contractor might have submitted an abnormally low tender because of misinterpretations of the functional specifications of the contract.
**H5. 2nd Round: Cost Experts**

1. **Do you consider yourself working on:**
   - The client’s side
   - The contractor’s side
   - or both sides?

**Answers**

Four participants responded that they work on the client’s side.

Three participants responded that they work on both sides.

Two participants responded that they work on the contractor’s side.

2. **In order to identify abnormally low tenders would you suggest using:**
   - Quantitative standards, i.e. establish mathematical standards or
   - Qualitative standards, i.e. establish a list of factors to be examined – including the deviation from the cost estimation, the deviation from the mean of the bids, risk analysis, etc. - only in qualitative terms?

**Answers**

Six participants suggested establishing qualitative standards.

Three participants suggested establishing both standards.

**Comments**

One participant commented that a factor to be examined in DC contracts is the ratio between direct costs and total costs to verify extremely low or negative overhead costs.

3. **Would you suggest setting those standards:**
   - In the national law
   - In the national law as provisions to be implement unless the client argues about not using them
   - or in the tender documents?

**Answers**

Seven participants suggested the tender documents to make the standards context-specific.

One participant suggested setting the standards in national law as suggestions.

One participant suggested setting the standards in the national law.

**Comments**

One participant commented that the quantitative standards should be set in the tender documents.

One participant commented that the standards should be set in the client’s tendering guidelines.

One participant commented that the standards should be set in the Gids Proportionaliteit.
4. If mathematical standards would be set for the identification of abnormally low tenders for which explanations should be asked from the contractor, would you suggest using the same standards (percentage deviation) for DC and DBFM contracts?

**Answers**
Six participants suggested using different standards.
Two participants suggested using the same standards.
One participant gave no answer.

5. Would you suggest asking for price specifications in the bids to be submitted so as to improve the evaluation of bids and the identification of abnormalities?

**Answers**
Eight participants suggested asking for price specifications in the tender.
One participant did not suggest not asking for price specifications.

**Comments**
One participant suggested asking for man-hours, equipment type and hours, the ratio between: material cost and tender price, maintenance cost and tender price, finance cost and tender price.
One participant suggested asking for specific items, instead of asking for price specifications out of every tender.
One participant commented that it could be asked to make the bids based on the SSK system.

6. Based on the outcome of the first round of interviews, it seems that the use of integrated contracts makes the identification of abnormally low tenders more complex, do you agree?

**Answers**
Eight participants agreed.
One participant did not agree.

7. Do you believe that an analysis - for each market (e.g. rail projects) - of the outcome of previous project tenders would assist in improving the way procurement processes are organized, by focusing on the characteristics of the market (e.g. efficiency, sensitivity)?

**Answers**
Eight participants answered positively.
One participant answered negatively.

8. Do you consider the identification of ALTs as a step towards the direction of economically sustainable procurement?

**Answers**
Eight participants answered positively.
One participant answered negatively.
“De tunnel in de A4 tussen Delft en Schiedam is geen koopje meer. De aanvankelijke triomf over de aanbestedingsmeevaller en een voortvarende start is omgeslagen in moeizame verhoudingen met claims over en weer.”

Risks concerning the soil conditions were not considered adequately during tendering of the A4. The bid that was awarded the contract by Rijkswaterstaat was almost 35% lower than the mean of the bids. The construction costs are 50% higher than expected and timely claims for additional costs have risen.

Strukton warns that ProRail opts for low price in maintenance works at the expense of quality.

NS opts for trains that cost less, offered by AnsaldoBreda, which cannot live up to the expected quality of the HSL.