

The tender as investment

A qualitative study on contractor perception of tender costs in
integrated infrastructure projects

MASTER OF SCIENCE THESIS

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The tender as investment

A qualitative study on contractor perception of tender costs in integrated infrastructure projects

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Preface

I was invited to produce the notes at an information session hosted by the Dutch Road Authority. A new project was going to be procured and the market was invited to hear about the new procurement methods that were going to be employed. For me as a student and soon to be unemployed engineer it was the ideal opportunity to meet people involved in creating the largest infrastructure projects in the Netherlands.

The startling amount of questions, remarks and opinions expressed regarding the choices of the road authority in their procurement surprised me. Procurement turned out to be more of a puzzle than I had been prepared for. It sparked my interest in this, apparently, wildly speculative and volatile world.

I was determined to figure out this process. Procurement shouldn't be that difficult, or costly or wrought with distrust, as it is. As an engineer I intended to fix this issue. Determining the actual subject of this thesis turned out to be a bit harder. Proposals were met with great enthusiasm that could only lightly coat the very necessary refinements. I was stubborn and my desire to proceed and excel proved to be a hindrance. I could not, obviously, fix the issue.

The patience and support of my supervisors was invaluable. Marleen Hermans, your relentless questions and challenges to my assumptions and perceptions have haunted me during this process. It is because of this that I have learned so much and you have truly enhanced my abilities and the standards I set for myself. Thank you.

Leon Hombergen, you might just be the most popular thesis supervisor at CME so I am glad to have you in my committee. Your organisational advice and the access to your network was indispensable. At times I was truly at the end of my rope and you never failed in lifting my spirits, and providing me with the drive to improve.

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And then there's you, you know who you are. Thank you.

As I write the last words of this thesis I am glad to say I am content. A fantastic period of my life, as a student in Delft, has come to an end.

Summary

This thesis investigates the influences on the perception of tender costs by contractors. This perception that tender costs are high is instigated by a change in operation of the construction industry. Since 2000 the use of integrated contract and MEAT as an awarding mechanism has increased. This change in operation is linked to increased tender costs in both scientific and professional literature.

High tender costs and also the perception of high tender costs can reduce the willingness of contractors to participate in the tender reducing competition and creating a disadvantageous situation for clients. For contractors high tender costs can result in non profitable business cases and foregoing work because of the expectation of high tender costs which reduces turnover.

This thesis addresses this situation as follows:

The shift towards integrated contracts and MEAT has coincided with a perception of increased tendering costs. This undermines the contractors' business model, increases costs to society and reduces the number of contractors willing to participate in the tender. These problems cannot be adequately addressed since underlying influences on this perception of increased tender cost are not fully understood

An initial literature study did not confirm whether tender costs are indeed high. Since no academic consensus on the influences on tender costs was found the latter part of the problem is the main focus of this thesis as is expressed in the following research questions.

- Main question: How do elements in current procurement methods influence the perception of tender costs in integrated projects.
- Sub question 1: What are influential factors regarding tender costs or the perception thereof mentioned in literature?
- Sub question 2: How are elements sourced from literature experienced by contractors in terms of their impact on their perceived tender costs?
- Sub question 3: What other influences do contractors experience in their tendering process, that affect their perception of tender costs?

In order to answer these questions both a narrative and systemic literature study are performed in order to identify possible influential factors. These factors are addressed using semi-structured interviews, which also contributed influential factors. The conclusions drawn from the interviews are validated using a focus group consisting of interview participants, control questions in the interviews and an independent interview with a new participant.

Results

The main conclusion of this thesis is an adaptation of the main research question. Tender costs are no longer considered the central application point for influences. The tender costs are always considered in tandem with the opportunity offered by the project. This perceived opportunity/costs ratio forms the center of a decision scheme that describes the influences within a tender from the perspective of the contractor.

Influences are provided by the client, the contractor and the method utilised for the tender. A striking observation is that client and contractor influences are mentioned far more, and with a greater range of influences than method influences.

Contractor influences consist mostly of strategic decisions and perceptions of project characteristics that increase the opportunity. This increase in opportunity is due to increasing the expected value of the won project and advances in experience and other inter project spill over. Contractor influence on costs consist mostly of organisational traits that allow contractors to vary their investment based on their experience and organisational efficiency.

Client influences in both cost and opportunity consist of organisational and communicative actions that interfere with the efficiency of the contractors tender activities. A main concern is the proper use of methodological elements, allowing for benefits from increased organisational and technical freedom in integrated contracts to be fully exploited by the contractor.

The shift in paradigm from tendering as a purely cost driven enterprise to an investment opportunity for contractors allows both clients and contractors to benefit. Contractors can employ strategic allocation of budgets between tender requirements to optimize their investment in the intra and inter tender opportunities.

Clients can employ costly elements in their tender to increase their benefits while maintaining interest from the market. As long as opportunity in the form of, per example, differentiability of tenders and monetisation of innovative products is offered, contractors are willing to invest in the tender.

Samenvatting

Deze thesis onderzoekt de invloeden op de perceptie die aannemers hebben van tenderkosten. De perceptie dat tenderkosten hoog zijn wordt ingegeven door een operationele verandering in de bouwindustrie. Sinds 2000 is het gebruik van geïntegreerde contracten en EMVI toegenomen. Deze verandering wordt gelinkt aan verhoogde tenderkosten in zowel wetenschappelijke als professionele literatuur.

Hoge tenderkosten en ook de perceptie van hoge tenderkosten kan de animo tot deelname onder aannemers reduceren waardoor concurrentie in de tender vermindert. Aannemers kunnen door hoge tenderkosten onhoudbare begrotingen voorzien en daardoor besluiten niet meer mee te doen wat de omzet doet dalen. Deze thesis formuleert het probleem als volgt:

De verschuiving naar geïntegreerde contracten en EMVI gaat samen met de perceptie van verhoogde tender kosten. Dit is negatief voor het bedrijfsmodel van aannemers, verhoogd kosten voor de samenleving, en reduceerd de deelname aan aanbestedingen. Deze problemen kunnen niet goed bestreden worden omdat de onderliggende invloeden op deze perceptie niet goed zijn onderzocht.

De initiële literatuurstudie kon niet bevestigen dat tenderkosten inderdaad hoog zijn. Aangezien er geen consensus is over de invloeden op de tenderkosten is het laatste deel van de boven gestelde probleemstelling het onderwerp van deze thesis. Deze focus is uitgedrukt in de volgende onderzoeksvragen:

- Hoofdvraag: Hoe beïnvloeden elementen in de huidige aanbestedingsmethoden de perceptie van tenderkosten in geïntegreerde projecten
- Deelvraag 1: Wat zijn de influentiele factoren op tenderkosten en de perceptie daarvan die in de literatuur worden genoemd?
- Deelvraag 2: Hoe wordt de impact op de tenderkosten van elementen uit de literatuur ervaren door aannemers?
- Deelvraag 3: Welke andere invloeden ervaren aannemers in het tender proces en hoe beïnvloedt dat hun perceptie van de tenderkosten?

Om deze vragen te beantwoorden is een beschrijvende en systematische literatuurstudie uitgevoerd. Deze literatuurstudies geven inzicht in de huidige kennisgraad en identificeren mogelijke invloed factoren. Deze factoren worden middels semi-gestructureerde interviews bevraagd aan aannemers en adviseurs.

Deze interviews dragen tevens bij aan nieuwe invloed factoren. De conclusies uit de interviews worden gevalideerd middels een focus groep bestaande uit deelnemers aan de interviews. Door in de interviews enkele controlevragen te stellen kan intern worden gevalideerd en een interview met een externe expert geeft extra verificatie van de resultaten.

Resultaten

De hoofdconclusie van deze thesis uit zich in een aanpassing van de hoofdvraag. Tenderkosten worden niet beschouwd als het centrale aangrijpingspunt van invloed factoren. Tenderkosten worden altijd samen met de mogelijkheden die de tender biedt gewogen. Deze mogelijkheden/kosten ratio vormt het centrum van een beslissingsschema dat de invloeden binnen de tender beschrijft vanuit de aannemer.

Invloeden komen vanuit de aannemer, klant en de aanbesteding methode. Een opmerkelijk observatie, gezien de formulering van de hoofdvraag, is dat klant en aannemersinvloeden meer en met een grotere verscheidenheid genoemd worden in de interviews.

Aannemersinvloeden bestaan uit strategische beslissingen en percepties van project eigenschappen die de mogelijkheden van een tender vergroten en deze zo aantrekkelijker maken. De mogelijkheden worden vergroot omdat de verwachte waarde van het gewonnen project groter wordt of dat ervaringen en andere effecten bijdragen aan betere resultaten over meerdere tenders.

De invloeden die de aannemers uitoefenen op de kosten zijn organisatorische eigenschappen gebaseerd op hun ervaring en efficiëntie die aannemers in staat stellen hun investering in verschillende onderdelen van de tender optimaal in te richten.

Klant invloeden in zowel de kosten als mogelijkheden bestaan uit organisatorische en communicatieve acties die de efficiëntie van de tenderactiviteiten van de aannemer verminderen. Het juiste gebruik van aanbestedingsmethoden komt sterk naar voren. Bij juist gebruik kunnen de voordelen van een grotere organisatorische en technische vrijheid in geïntegreerde contracten optimaal worden benut.

Wanneer de tender meer wordt gezien als investeringsmogelijkheid ten opzichte van een kostenpost kunnen zowel klanten als aannemers profiteren. Aannemers kunnen door de strategische allocatie van budget over delen van de tender hun investering optimaliseren en zowel binnen een enkele tender als over meerdere tenders hogere omzetten halen. De klant kan kostbare elementen vragen zonder de interesse van de markt te verliezen. Zolang aannemers de mogelijkheid geboden wordt om zich te differentiëren en lessen mee te nemen naar volgende tender is de investeringsbereidheid groot.

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Glossary

Table 1: Glossery of terms

Term or Acronym	Dutch	English	Meaning
DBB	DBB	DBB	Design Bid Build, a contracting form where the design and construction of a work are offered in seperate tenders. Often called traditional procurement.
D&C	D&C	D&C	Design and Construct, sometimes called Design and Build. A contract form where designing and constructing a work is integrated in a single contract.
DBM	DBM	DBM	Design Build Maintain, a contract form where the tasks of designing building and maintaining a work are integrated in a single contract.
DBFM	DBFM	DBFM	Design Build Finance Maintain, a contract form that is often used in PPP projects, where one party is responsible for the full range of construction activities.
MEAT	EMVI	MEAT	Most Economically Advantageous Tender. A means to incorporate criteria other then price for awarding the tender
PPP	PPS	PPP	Public Private Partnership, in dutch Publiek Private Samenwerking. A glossary term for project that are, at least partially, funded by private partners.
UAC-IC	UAV-gc	UAC-IC	Uniform Administrative Conditions for integrated contracts. A base contract provided by special interest groups in construction to serve as a common starting point.
WPR	ARW	WPR	Works Procurement Regulations (in dutch Algemeen Regelement werken),Rulebook regarding procurement procedures in works under the European,threshold

Chapter 1

Introduction

The construction industry is working through an enormous change in operation. At the end of the 1990's many countries were experiencing a lack in innovation and performance in their respective construction industries (Doree, Holmen, Caerteling, & Cae, 2003) (Hermans, Volker, & Eisma, 2014) (Lenferink, Tillema, & Arts, 2013). Adversarial tactics in construction procurement, and performance reductions in construction with respect to other industries are mentioned in literature from Sweden, the UK, and the Netherlands (Hughes, Hillebrandt, Greenwood, Kwawu, et al., 2006) (Erik Eriksson, 2007) (Doree et al., 2003). These adversarial practices result from a competitive environment induced by public procurement (Erik Eriksson, 2007) (Doree et al., 2003). They lead to, among other things, lack of inclusion of contractor knowledge in technical solutions and planning (Erik Eriksson, 2007), higher than necessary costs and delayed project delivery (Boes & Dorée, 2008) and adversarial attitudes that hinder cooperation and communication (Erik Eriksson, 2007). Different strategies were developed to address these downsides of procurement, culminating in a proposed change in procurement strategy called innovative procurement (Boes, Dorée, & van der Veen, 2002) (Boes & Dorée, 2008).

Public procurement is the practice of acquiring goods or services by a public party (a government) from a supplier. The competitive environment created by public procurement is intentional and mandated by law. European guidelines mandate the use of public procurement on a European scale over a certain threshold (€5.186.000,-) (Aanbestedingswet, 2012) (European parliament and Council, 2004). National procurement is mandated for public parties under this threshold (Aanbestedingswet, 2012). For specific purposes national procurement doesn't necessarily need to be public (Ministerie EZ, 2013). Procurement by public and private parties is used as a method to foster the best value for money and ensure accountability (Holmes, 1995) (Schrijfgroep gids proportionaliteit, 2013). In the Netherlands this has ensured that also local governments have incorporated guidelines based on the procurement law in which they specify how and through what standards they ensure fair and transparent procurement (Aanbestedingswet, 2012) (Schrijfgroep gids proportionaliteit, 2013) (Ministerie EZ, 2013).The process of competition and the apparent transparency of procurement procedures is also meant to reduce collusion and preferential buying (Heijboer & Telgen, 2002) (Boes & Dorée, 2013).

Procurement & Tendering

For this report the public party is a national or regional government acquiring the realisation of works from a contractor. This process is called procurement. The public party requests a multitude of tenders from different contractors. The tender in this respect is the proposal submitted by the contractor. Tendering is the process of the contractor to formulate and present his proposal

The use of taxpayer' money by public agents when procuring assets instigated a focus on lowest price award criteria (Boes & Dorée, 2013), as it was deemed proper to spend tax money in the most economic way. Awarding tenders on lowest price according to a Design-Bid-Build principle was commonplace in the Netherlands (Doree et al., 2003). Design-Bid-Build is a practice, in literature commonly called traditional procurement, where a specific design is procured. Design responsibility therefore lies with the client who designs in-house, or outsources this work. The finalised plans are put out to tender with different contractors.

A competitive environment focused on price reduction gives contractors an incentive against cooperation with the client. It creates an adversarial atmosphere where the client strives for the highest costs at the lowest price, and the contractor for the lowest costs at the highest price. In the process disregarding quality. This constitutes a complete conflict of interests. Price as such can become a tactical pawn used to gain the contract at cost, or below cost, resulting in post-contract negotiations regarding extra costs, additional funding etcetera (Holmes, 1995) (Boes & Dorée, 2008). Once the tender is accepted, clients are locked in allowing for a reopening of negotiations on scope-changes or work increases. By selecting the Most Economically Advantageous Tender (MEAT) this practice is discouraged.

Fuelled by the above mentioned problems a change in policy was instigated (Boes et al., 2002). The need for a policy change was further strengthened when a widespread collusion case in the Netherlands was discovered (Boes & Dorée, 2008). The change in policy was called the innovative procurement program.

The goal of innovative procurement was to provide more possibilities for contractors to present their know-how to the market, induce innovation and allocate risk to the most suitable partner. The term was coined by Boes et al. (2002) ("innovatief aanbesteden" in Dutch). This process meant that more focus was to be put on utilising integrated contracts like Design&Build, and to use functional requirements as opposed to technical specifications as award criteria.

With the proposal of innovative procurement a warning for increased tender costs for both client and contractor was issued in 1999 (Boes et al., 2002). Contractors did experience an increase in costs as was confirmed in 2002 (Boes et al., 2002). This is attributed to the additional work related to tendering integrated contracts. The benefits of integrated contracts like cost and time savings in the construction process (Geraedts, 2009) (Forbes & Ahmed, 2010) (Lenferink et al., 2013) could be hindered by increased tender costs. The innovative procurement program has taken effect. Integrated contracts are used more often and for larger volumes (Wallinga, 2010), with 55% of the value in 2009 being procured in

an integrated contract (Hardeman, 2012). In 2011 the relative use of integrated contracts in terms of volume was reduced to 34%. However in the same period the number of integrated projects procured increased from 185 projects in 2009 to 203 projects in 2011 (Hardeman, 2012). This could be because the economic crisis took effect, since the total number of projects tendered decreased with 15%. This shows that the use of integrated contracts is increasing.

Besides this, the use of "most economically advantageous tender" or MEAT, is utilised in more than 70% of the cases in 2014, up from 20% in 2009 (Hardeman, 2014). This can be attributed to the introduction of the procurement law of 2012, which made MEAT a requirement unless a reason not to can be specified. MEAT can be a means to utilise qualitative criteria and ensure functional specification. As stated before this fuels the perception of an increase in tender costs over the past 15 years. Literature review however yields few results in terms of scientific literature describing a tender costs increase, or describing tender costs in general.

In professional literature it is stated that between 2009 and 2014 62% of companies experienced an increase in time consumption for tenders (Ecorys, Van Zutphen economisch advies, 2015). This is researched for all public tenders regarding services, works and products by a commercial bureau commissioned by the Dutch government. In many pieces of scientific literature regarding related subjects such as the effects of tender procedures on project success, high tender costs are mentioned, but not researched (Harding, Lowe, Hickson, Emsley, & Duff, 2000) (Heijboer & Telgen, 2002) (Holmes, 1995) (Koppinen & Lahdenperä, 2007). This is elaborated in section 4.1.

If contractors indeed perceive an increase in tender costs this could lead to reduced participation, reduced revenues and other problems for the contractor, client and society as a whole. This is elaborated in section 2.1.

What is clear is that the underlying mechanisms and influences behind the perception of increased tender costs is poorly understood. With integrated contracts and MEAT being perceived as sources of both increased benefits and increased tender costs no clear answer is offered.

Because tenders, their costs and contractors strategies in the tender have a high competitive value it is expected that access to this data is not permitted for this research. Therefore a qualitative study is performed which can only look at the perception of participants of tender costs. However even a perception of high tender costs can instigate problems with participation of contractors and weaken the position of contractors.

It remains vital to understand how this perception is influenced and which parties are capable of influencing this perception in order to take full advantage of the shift towards integrated contracts and MEAT as an award mechanism. This research aims to contribute to this understanding by developing a theory regarding the influence on contractor perceived tender costs.

1.1 Reading guide

This report consists of nine chapters that each contribute to an increased insight in the influences on the contractor perception of tender costs. This chapter aims to provide an introduction into the background of the problem and underline the necessity for research.

Opening chapters

Chapter 2 Problem definition elaborates on the problem that the perception of high tender costs and the influences upon this perception is poorly understood. This chapter also offers the research questions and the scope of this research.

Chapter 3 Research design states why this research is a qualitative study and explains how the literature study, the semi structured interviews and the expert review contribute to the thesis. In this chapter it is also elaborated how the underlying theory of governance, transaction costs economics and auction theory play a role in the thesis. Finally this chapter reveals the conceptual model that functions as a benchmark. In every further analysis step this conceptual model is expanded upon to illustrate the iterative expansion of insight.

Part 1 Exploring current knowledge

Chapter 4 Literature study is the first part of the actual research structure ; exploration. The literature study provides the explorative basis for the interviews as well as providing an insight in the current state of research in tender costs. The theories mentioned in chapter 3 are explained up to their point of relevance to this study.

Part 2 Formulating theory from interviews

Chapter 5 Interviews and analysis and 6 Interview results form the second part of the research structure;theory formation. The literature study proved to be insufficient in providing a full overview of influences on the perception of tender costs. The exploration phase thus expanded in the interviews, with the main goal of the interviews remaining unchanged.

The data collected through the interviews provides an insight in the influences on the perception of tender costs and their point of impact. The formation of a theory is possible and it is shown that tender costs, as portrayed by the literature study are not the main point of impact. The sources of the influences are research revealing that the influence ownership lies with clients, contractors as much if not more then with solely the method.

Part 3 Validating theory

Chapter 7 Expert review offers the final part of the research structure; validation. Since this study is a qualitative study, verification and validation is difficult. There is no statistical proof or means to extrapolate results to the population. All conclusions are valid only for the participants of the study. This validity within the study is tested through revisiting the participants in an expert review. Also through control questions asked in the initial interviews the suitability of the participants is verified. The final validation is offered by an interview with an expert who was not part of the initial interview set, to see if the results are recognised in the experience of this participant.

Concluding chapters

Chapter 8 Discussion and 9 Conclusions and recommendations are the concluding part of this thesis. The discussion offers a reflection on the used methodol-

ogy and the process of this thesis. The conclusions states the seven conclusions drawn from the interviews, whether they where validated and the implications of these conclusions for the procurement process. The chapter is concluded with recommendations for clients and contractors to deal with these implications and recommendations for future research.

Chapter 2

Problem definition

The introduction provided an overview of the changes in the construction industry that serve as the instigation of this research. The use of integrated contracts and MEAT as an award criteria carries warnings of increased tender costs, as is presented in the introduction. The actual influences are poorly understood. This problem is elaborated in the following section 2.1. In section 2.2 the specific aspects that are researched in this thesis are presented as a set of research questions. The research question is followed by the scope of this research in section 2.3. Within the scope the recurring definitions of this thesis are presented as well as a basic description of procurement law and contracting and procedural possibilities within the realm of infrastructure procurement.

2.1 Problem statement

Increased tender costs seem to be logically related to the changes in the construction industry. A shift towards integrated contracts and away from price based award criteria results in additional workload for contractors during the tender. Also a shift in risks from client to contractor could lead to increased preparation costs in general to quantify these risks (Lenferink et al., 2013).

In the integrated contracts the contractor also bears responsibility for the design. Contrary to traditional contracts, the contractor is also expected to show this capability in the tender. Also, in order to adequately estimate the costs and planning of the construction, a part of the design needs to be available. This means that this part of the design needs to be produced during the tender. This constitutes an increase in workload for the contractor, that coincides with the shift towards integrated contracts. Therefore increased tender costs seem to be a logical consequence from the shift towards integrated contracts.

Literature offers contradictory conclusions regarding increased tender costs. Boes et al. (2002) predicts an increase in tender costs due to increased design effort in the tender. Hughes et al. (2006) confirms increased tender costs and the underscores that exact increases or influences are not understood. Later professional research by Strand, Ramada, and Canton (2011) states that tender costs in the Netherlands have decreased, mostly due to the updated procurement law of 2012. This research was commissioned by the ministry of Economic Affairs to evaluate this law. This research focusses strongly on a reduction

of legal requirements but possible influences identified by other resources are not universally recognised. This uncertainty in the connection between new procurement methods and higher tender costs is the main concern of this thesis.

High tender costs present a problem for clients, contractors and society as a whole. Reduced participation in tenders, high workloads and stress levels for contractors and a misuse of resources for society are associated with increased tender costs. This is elaborated below.

An increase in tender costs is scarcely researched but abundantly mentioned. The mechanisms behind the increase in tender costs are unknown but elements concerning the procurement method are frequently mentioned. In order to remedy the negative effects of high tender costs it is paramount that the influences on the perception of high tender costs are understood, which is the goal of this thesis.

The overall problem thus reads as follows:

The shift towards integrated contracts and MEAT has coincided with a perception of increased tendering costs. This undermines the contractors' business model, increases costs to society and reduces the number of contractors willing to participate in the tender. These problems cannot be adequately addressed since underlying influences on this perception of increased tender cost are not fully understood

The main actors and society as a whole are impacted by this problem in different ways. The following subsections describe how contractors, clients and the society is impacted, underscoring the importance of understanding the underlying influences.

2.1.1 Problems for the contractor

For contractors an increase in absolute tender costs means that the investment needed to acquire work can grow too large. All companies are always required to invest in networking, advertising and other means to acquire projects (Hughes et al., 2006). However when costs associated with winning the tender soar the overall business case can weaken. This means that individual contractors may not be able to tender for larger projects, unless they take large risks for their operational cash flow.

The investment always needs to be proportional to the expected profits, and with margins thinning because of the economic crisis this proportionality is deteriorating. This causes companies to forego entry and as such miss out on large quantities of work.

This effect is observed and in 2014 between 13% of small contractors and 30% of large contractors admit to having foregone entry due to perceived high tender costs, at least regularly (Hardeman, 2014). A stunning 80% of contractors with more than a hundred employees have foregone entry sometimes because of perceived tender costs.

2.1.2 Problems for the client

Clients usually employ tendering methods to increase competition and gain a price reduction and/or quality increase from said competition (Holmes, 1995).

The overall notion is that the value of projects increases as they are further integrated (Boes et al., 2002; Boes & Dorée, 2008; Harding et al., 2000). This increase in value is caused by, among other things, overall cost reduction in total project costs (Harding et al., 2000), better risk management and shorter project duration (Boes et al., 2002). This increase in value mostly benefits the client yet it seems additional costs in the tender are mostly borne by contractors. However if contractors are unwilling to participate in tenders because of increased tender costs, the value from quality increases or costs reductions due to competition is lost.

Also higher tender costs, if these are dependant on the specific market, increase prices in these specific markets fuelling specialisation within these markets (Hillebrandt & Hughes, 2000). This specialisation reduces competition and is an incentive for collusion, especially when the market is tight.

2.1.3 Problems for society

From a societal point of view to have a large amount of identical work done by several firms, only to have most of this work prove useless can be considered wasteful (Boes et al., 2002) (Hughes et al., 2006). This work could benefit society otherwise. Especially when employing public tender procedures there can be a large number of contractors producing designs, most of which go unused.

High tender costs are an incentive for contractors to increase their chances to win bids by providing detailed plans and designs. This increases the workload on the contractors. This workload on contractors in preparing the elaborate bids is very large and considered problematic (Boes et al., 2002), which also puts a strain on society. Especially since the time awarded for producing a tender is short (Boes et al., 2002). This increased workload reduces the well being of employees. A reduction in workload for each tender, would reduce the amount of wasted work due to lost tenders and reduce the workload on companies, thus benefiting society.

2.2 Research Question

The problem statement elaborated above forms the basis for the research question that is determined in this section.

This research aims to provide insight in the underlying influences on perceived tender costs. This insight could be used by clients in developing an increased awareness of the impact of procurement methods and the unnecessary strain they put upon the financial positions of contractors. Future research into a better use of procurement methods, based on the underlying influences found in this thesis, would benefit competition and decrease societal costs of procurement. Contractors will be able to better determine their freedoms regarding the costs associated with specific tender procedures and use this knowledge for strategic decisions regarding participation and investment in the tender.

This research is executed as a qualitative study, because of strong competitive interests it is expected that access to actual tender costs data will be unavailable. The possibility of drafting a survey on the influences on tender costs is not considered. The literature studied offered insufficient input for defining testable hypotheses. This does mean that there are limited possibilities in

addressing the problem stated above.

Therefore the research questions stated below focus on the connection between procurement methods and **perceived** tender costs, rather than the tender costs itself.

As outlined in the introduction the underlying influences on perceived tender costs are not fully understood. Whether tender costs are actually higher, and in respect to what is relatively unclear. What is clear is that the perception of high tender costs, is prevalent and the issues mentioned in section 2.1 are present. Therefore it is important to understand how the perception of high tender costs is construed and what aspects influence this perception.

The research question posed in this report is therefore as follows:

How do elements in current procurement methods influence the perception of tender costs in integrated projects

This main research question focusses on the final part of the problem statement, aiming to provide more insight in the underlying influences on perceived tender costs. The answer to this research questions offers an insight in the manner in which contractors view the influences on the tender costs by different procurement methods and in the overall procurement process. This allows for both clients and contractors to evaluate their preferred procurement method based upon the cost incentives embedded in the method. In order to answer this question three sub questions are asked. Firstly:

What are the influential factors regarding tender costs or the perception thereof mentioned in literature?

Secondly:

How are elements sourced from literature experienced by contractors in terms of their impact on their perceived tender costs?

Thirdly:

What other influences do contractors experience in their tendering process, that effect their perception of tender costs?

The first question offers both an insight in the currently available research on tender costs in infrastructural works, as well as providing a basis for the interviews. These interviews answer the second sub question which provides the link between theory and practice.

Tender costs are often expressed as a percentage of the contract value. Contractors may also be influenced by absolute or relative costs, or other elements besides cost. The elements found in literature may or may not be of practical interest to contractors. Whether this is the case, is answered through the second sub question.

The third sub question focusses more on the overall experience of contractors in the tendering process. While literature forms the basis for the interview protocol, the open format utilised allows for additional inputs. In order to

answer the main research question, besides mapping influential elements, the manner in which influence is exerted must also be addressed. This is addressed in the third sub question.

2.3 Scope

This section presents the scope of the research, the definitions used, and an insight in the applicable contracts and procurement procedures as they are described in law and official guidelines.

2.3.1 Research scope

The importance of scope is exemplified by one of the main sources of this thesis. The research by Hughes et al. was very large and the reason it states for not finding reliable results are the large amounts of different projects and tender procedures which make comparison difficult. This study intends to limit the scope, allowing for more reliable results.

In this research the scope is defined as follows:

- Scope is limited to infrastructural works
- Scope is limited to medium sized contracts
- Scope is limited to contracts integrating design, engineering and construction
- Scope is limited to projects with public clients
- Scope is limited to tender costs faced by the main contractor

By limiting the scope to infrastructural works, the research remains close to the expertise of the author. The TU Delft and the civil engineering department have a strong focus on infrastructure. Secondly this scope limitation mitigates an overlap in services and works tenders in for example architecture fees. Also, the procurement of infrastructural works is mostly done by government entities, which ties in with the scope limitation on public clients.

The choice for medium sized contracts is instigated by the realisation that tender costs tend to be stable around 1% of the contract price if the contract price is over €1.000.000,- (Hardeman, 2014). By focussing on medium sized contracts possible large difference in proportional tender costs can be avoided. Excluding large projects means that the results of this research would be more easily implemented in a pilot. The choice for medium sized contracts also requires medium to large contracting organisations to be questioned meaning the context of this study excludes a large part of the construction industry since 74% of businesses in the infrastructure sector employ less than 10 full time employees and can be considered small (Visser, 2015).

Limiting the scope to the integration of design, engineering and construction means excluding maintenance ,financing and operational tasks from the integrated package offered. This is because it is expected that these tasks encompass such a large influence on the tender costs that the tendering method becomes inconsequential. Generally speaking maintenance and financing are

part of larger contracts, which means this would also interfere with the scope choices with regards to contract size. As this research does not aim to provide a comparison, traditional contracting is also not taken into account.

Public clients make up a vast majority of clients in infrastructure. Furthermore these clients are bound by rules and regulations from either EU directives or internal agreements for fair, balanced and transparent procurement (Schrijfgroep gids proportionaliteit, 2013). This entails that government agencies self-impose, national, or European guidelines in tendering and as such need to be aware of the ramifications of their behaviour.

In terms of tender costs the main differentiator that is used both in the professional and scientific literature is the distinction between costs for the client and costs for the contractor. In this research the scope is limited to costs for the contractor. Hillebrandt and Hughes (2000) concludes that contractors are the party that is mainly affected by the high tender costs. In a study by Strand et al. (2011) it is determined that 75% of costs for tendering lie with the contractor and according to the EIB this figure is 91% (Hardeman, 2014). An optimization of tender costs, as this research proposes, will therefore mostly affect contractors as well. Therefore this is the focus of the research, and within this research the term tender costs is reserved for contractors' costs where procurement costs are those costs incurred by the client, as is elaborated below.

2.3.2 Definitions

The main subject of this research is tender costs, defined as the costs incurred by the contractor in supplying a proposal and the procurement method, defined as the process through which the client procures the desired assets and services incorporated in the contract. Because large infrastructural projects often include a multitude of parties a definition of the contractor as meant in this study is also given. The main definitions, as used in this study, are elaborated below. For a more elaborate overview of definitions used in the studied literature see table A.2.

Procurement Procurement is defined in literature in many different ways. Holmes (1995) suggest the practice dates back at least three hundred years. A review of research in the field of procurement is offered by Naoum and Egbu (2015). The definition used in this paper is as follows:

"Procurement is a system for defining responsibilities and risks in a construction project".

Other definitions are mentioned but the common denominator revolves around responsibilities and risks. The European council (European parliament and Council, 2014) defines it as:

" Procurement within the meaning of this Directive is the acquisition by means of a public contract of works, supplies or services by one or more contracting authorities from economic operators chosen by those contracting authorities, whether or not the works, supplies or services are intended for a public purpose."

For this research the definition is as follows:

Procurement is the process through which a public body awards a contract for at least the construction of infrastructural works in an openly accessible process to one of a larger group of bidders.

Procurement method There are a multitude of definitions used as is also stated by Naoum and Egbu (2015) in their review of procurement method research. Most definitions are limited to the contractform used or the method of selecting contractors in terms of criteria used in the selection and awarding phase (see table: A.2)

This study attempts to find the overall influence of the choices within procurement as a whole. That said, this study is interested in ex-ante processes, therefore disregarding post contract elements of procurement methods. Ex ante contract, the main elements that remain are the selection and award criteria, the contract specified and communication aspects. As shown in table A.2 communication and procedural elements are not often included in procurement methods as defined by these authors. In this study procurement method is defined as follows:

The collection of decisions (award criteria, communication moments) and instruments (contracts, procedures) used by the client in order to arrange the process of procuring the collection of assets and services in an construction project.

Tender costs Tender costs are defined differently throughout the literature, as is shown in figure A.1. In the professional literature from Ecorys and the EIB respectively it is referred to as 'costs' and 'transaction costs' (Ecorys, Van Zutphen economisch advies, 2015; Hardeman, 2014). Here Ecorys, Van Zutphen economisch advies (2015) uses the following definition (translated from Dutch and summarised):

the burden for companies consists of administrative burdens following rules and regulations and other burdens in direct relationship to the subject of the tender.

Ecorys, Van Zutphen economisch advies (2015) differentiates administrative costs and other costs, where Hardeman (2014) speaks of calculation costs, working costs and other costs. Giving the following definition (translated from Dutch and summarised):

Tender costs ("Offerte-kosten" in Dutch) are costs incurred by the contractor in calculating the necessary price of the asset and formulating award documents, costs in personnel attending meetings or performing other tasks beyond the sphere of calculative work, and other costs regarding legal guidance or the procurement of necessary documents etc."

In the scientific literature Hughes et al. has done the most research in the field of tender costs to which he refers as 'costs of procurement'. These costs are incurred both by clients and contractors (Hughes et al., 2006; Hillebrandt & Hughes, 2000). His research tries to use transaction costs economics to categorise and explain trends in the costs of procurement but the overall conclusion is that transaction costs economics fails to grasp the construction industry see section 4.3 (Hughes, Hillebrandt, & Greenwood, 2005).

Hillebrandt and Hughes (2000) states that the general costs associated with being aware of tenders and being vetted for participation cannot be altered or diverted to ulterior goals. These costs therefore have no opportunity costs and should as such not be included in the definition of tender costs. In this research this line is followed. When heavily summarised the definition used by Hillebrandt and Hughes is:

"Transaction costs are those costs incurred by the contractor in obtaining an invitation to bid and estimating the price"

For this research the reasoning of Hillebrandt and Hughes on sunk costs in terms of awareness of projects up for tender is followed. This research has gone to some length to further define tender. In appendix A.1.2 tender costs as described in the different sources mentioned above are compared. The wide variety of possibilities and abstraction level on which tender costs are defined make it difficult to formulate a definitive list. The list suggested in appendix A.1.2 is inconclusive and questioning specific cost categories would hinder the open nature of the interviews. To allow for as much freedom as possible for participants to define and reveal their own costs structure, if so inclined, it is believed that a greater insight is given in the manner in which influence is exercised. Therefore a list of cost elements is included and tender costs are defined as follows:

Tender costs are those costs incurred by the contractor in preparing the necessary design, calculations, price point and other documents in the process of tendering from announcement of the tender to awarding of the tender

Contractor Contractors as meant in this research is the party that is contractually obligated to deliver the finished infrastructure project. The tender costs are those costs incurred in providing a proposal on what basis the project is awarded. Subcontractors or service bureaus may also incur tender costs when applying for supporting work for the main contractor. In order for this research to remain manageable it is assumed that these costs are recovered in the price of the main contractor, and are therefore included in the definition used.

This definition is similar to the one used by Hillebrandt and Hughes (2000):

"..'contractor' is understood to mean the party to the process who is contractually committed to the project of which construction is an important part."

The contractor is the party contractually obligated to deliver a finished infrastructure project.

2.4 Procurement law

Work on European public procurement law started in the 1970's. The first European legislation regarding procurement was issued in 1989 (European parliament and Council, 1989) to describe mandated procedures for procurement. These European guidelines were implemented in national law. In 2004 the EU issued an updated guideline on, amongst other things, works. This prompted the Dutch government to issue a rulebook on public procurement of works in 2005 called the Works Procurement Rules 2005 or WPR2005 (Aanbesteding Reglement Werken or ARW2005 in Dutch) (Apostol, 2011). The implementation of the updated 2004 guidelines in Dutch law took some time. The update focussed mainly on reducing administrative burdens, further opening of the internal market and the allowance of new technologies and selection methods (Canton, de Bas, Meindert, van der Wagt, & Maasland, 2012) (European parliament and Council, 2004). In the procurement law of 2012 these updates were implemented (Aanbestedingswet, 2012). This prompted an update to the WPR2005 and thus the WPR2012 accompanied the implementation of the new procurement law. Since the rulebook of 2005 was mandated for the national government and used by most regional governments most public procurements followed the updated guidelines.

In this thesis the procurement law of 2012 is followed. However in 2014 a new directive was published repealing the 2004 directive (European parliament and Council, 2014). This directive will be implemented in a new Dutch procurement law in 2016. If changes are relevant to the issue of this thesis, they will be mentioned.

For this thesis the relevant aspects of procurement law are the product delivery systems and procedural requirements that stem from the 2012 procurement law. These aspects are elaborated upon below. Procurement law is far more broad than these aspects incorporating competition requirements, fair use policies etcetera. These will not be referenced in the rest of this thesis and are therefore not elaborated upon.

2.4.1 Contract possibilities

This section describes the integrated contracts that fall within the scope of this project and the tender procedures used in these integrated contracts and those tender procedures that are part of the scope of this project. Main focus is to determine through literature study if and how tender procedures can be represented in an elemental form and secondly how these elements interact with the tender costs.

Complicated tender methodology has developed together with further integration of the building process. Even though traditional contracts tendered on price still exist and have their merit integrated contracts usually require a more elaborate approach. In the procurement law of 2012, the awarding of tenders

solely on price is prohibited unless by specific description (Aanbestedingswet, 2012). Three major contracting forms exist in the Netherlands, with corresponding tender methodologies (Boot et al., 2012, p. 31). traditional contract models, integrated contract models and life-cycle contract models. In this research integrated contract models are discussed. Life cycle contracts incorporate exploitation into the contract, which sometimes includes financing. In this thesis contracts that include financing, maintenance and/or exploitation are outside of the scope, as mentioned in chapter 1.

The UAC-ic is the Uniform Administrative terms and Conditions for integrated contracts (Uniforme Administratieve Voorwaarden voor geïntegreerde contracten or UAV-gc in Dutch). It is a standardised set of contractual terms that is usually utilised in the Design & Construct projects in the Netherlands. In these contracts the UAV-gc is declared applicable with exceptions and additions being clearly marked. For this study it is assumed that the UAV-gc is applicable.

2.4.2 Selection procedures

There is a limited number of procedures that can be used to select candidates that may tender on the above mentioned contracts. The most utilised are the open procedure and the restricted procedure (Boot et al., 2012, p. 141). The negotiated procedure is used very little and can only be used when determining the objective is difficult. A competitive dialogue procedure can also be used but is used mostly in contracts with integrated maintenance or financing. This research will focus mostly on the open en restricted procedure, since it is the expectation that these procedures are most prevalent in the scope set for this research.

In the open procedure the main differentiator are the award criteria used, since all parties may submit their tender. This procedure can be used for all tenders under all circumstances, and is used in 73% of all tenders in terms of number and 52% in terms of value. These number relate to all public procurement in all sectors in Europe (Canton et al., 2012) (Strand et al., 2011). In the construction industry 12,5% of the number of notices was awarded through an open procedure, equating to 20,6% of the value of all contracts (Strand et al., 2011). In the Netherlands Canton et al. (2012) states there is a more widespread use of the restricted procedure, mostly because there are more lower cost tenders, as the difference in terms of value is small. However, Canton et al. (2012) makes no differentiation in terms of industry. Strand et al. (2011) does differentiate and states that the open procedure is used in 80% of construction works. It is therefore assumed that the difference reported by Canton et al. is less prevalent for the construction industry.

The open procedure It can be concluded that the open procedure is widely used, but what constitutes an open procedure? The open procedure is a procedure described in the WPR (the Works Procurement Regulations)(Algemeen Reglement Werken or ARW in Dutch). In this procedure all interested parties that feel they can fulfil the predetermined criteria can bid on a contract. This can result in a higher number of offers. Counting all procurement in europe, the open procedure generates 5.7 offers as to 5.5 on average in a closed procedure

(Strand et al., 2011). No numbers on the construction industry in specific have been found.

The open procedure works with predetermined award criteria according to the MEAT protocol, that has been mandated by the procurement law of 2012. Since then use of MEAT criteria has increased dramatically.

An open procedure has certain elements unique to its process, mainly being:

1. No control over the number of applicants
2. Simultaneous testing on company suitability and project delivery capability.
3. Faster choice

The closed procedure The closed procedure differs mainly in the fact that the tender takes place in two phases. A selection phase and an awarding phase. In the selection phase any contractor may apply. They are selected based on criteria that are declared in the tender notice. These criteria are centred around financial and technical capability.

The tender is awarded, like in the open procedure, based on the MEAT. Different from the open procedure in the awarding stage companies may not be judged upon their financial or technical merit, but only on their plans for the execution of the project. This is because financial and technical requirements have already been fulfilled in the selection phase.

Secondly in a closed procedure it is possible that access to the award phase is decided based on lottery, if more than the desired number of applicants meet the pre set criteria. It is possible to utilise a negotiated procedure or competitive dialogue. However these are used rarely and are as such not part of the scope of this thesis.

Chapter 3

Research design

The introduction presented the urgency and motivation for this research. Explaining the necessity to understand the underlying influences on the perception of tender costs.

In this section the methodology used for this research is elaborated upon. The research consists of a two pronged literature study, semi-structured interviews and a validation round in the form of an expert review with participators of the interviews.

Because of limited access to data and insufficient input from literature to properly define questions for a survey this study is executed as a qualitative study. The aim of this qualitative study is partly explorative and partly formative (see figure 3.1). This distinction is expressed in the research tools used for each part, with literature research used for the explorative part and interviews for the formative part.

Conclusive elements that influence the interaction between procurement methods and their respective costs could not be sourced from literature. During the literature study it became apparent that, in order to consistently describe procurement method in an elemental way a more explorative approach was needed. The lack of formative possibility in the literature study also meant that the purpose of the interviews also shifted towards aiding the formative phase of the study. Using the interviews a more detailed account of methodological elements in procurement is made and the notion that relatively little research is done in the context of this study is confirmed.

The formative part of the study is conducted through semi structured interviews that are analysed through coding and categorising and conceptualising these codes into codes, sub codes, themes and ultimately into a theory regarding the influences on tender costs. The formative part is aimed at identifying elements of procurement methods and costs mentioned in the literature.

The research proved to be challenging and few sources were uncovered that shed light on the relation between procurement methods and tender costs. This limited literature research was used as a basis for the interviews. After the interviews were conducted additional literature research culminated in the two pronged approach presented in the thesis. In this set-up a narrative and systemic literature study are representative of both the explorative and formative phase. The formative phase of the study focusses on defining a causal map or model of the influences of elements of methodology on tender costs. This is aided

by the semi-structured interviews performed. The results of the interviews are presented as an iteration of the conceptual model presented in 3.3.

The validation phase utilises an expert review, conducted as a focus group for which participants in the interviews were invited. By presenting the findings of the literature studies and interviews and monitoring the responses, the findings are validated in a process called member checking (Hennink et al., 2010). Control questions within the interviews and a final interview with a source that did not participate in the original interview series contribute to the validation. After validation the final iteration in modelling is presented.

For the formation of the research design and the evaluation of the options in terms of data collection tools and data processing options this study utilises the works of Bernard and Ryan (2009) and Hennink et al. (2010). For the realisation of the literature studies papers by Baumeister and Leary (1997) and Borrego, Foster, and Froyd (2014) are used as guidelines. The validation process utilises a paper by Baxter and Eyles (1997) and books by Morse, Barrett, Mayan, Olson, and Spiers (2002) and Burnard, Gill, Stewart, Treasure, and Chadwick (2008).

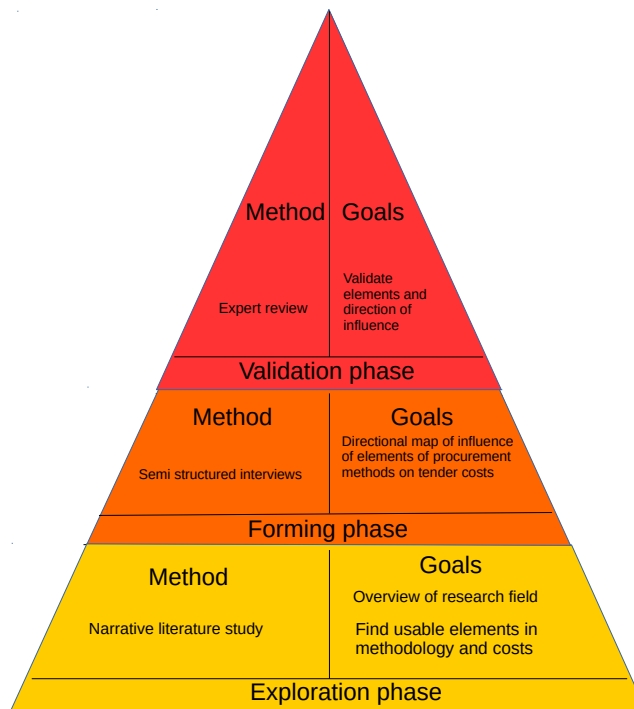


Figure 3.1: Initial research design overview

3.1 Research tools

This research makes use of several tools in the gathering and processing of data. In the following subsections the manner in which the literature study, interviews

and expert review are conducted is elaborated upon.

3.1.1 Literature study

The main goal of the literature study is to provide an overview of the current knowledge base and a structure for the qualitative assessment of tender costs incurred by the contractor in relation to the procurement method. The literature study thus answers the first of the three sub questions, identifying in part the influential factors regarding the perceived tender costs. This is congruent with a systemic literature review, as is elaborated in the next section on the initial study.

The literature study was interrupted by the interviews in the overall process of researching this thesis, as is also mentioned above. This interruption was due to an ambitious planning and the initial conclusion that little research was available. This segment of the literature study is presented as a narrative study since it does provide an overview of the available literature on this subject. The initial conclusion on the availability of research is challenged in the systemic literature study.

The literature study is conducted based primarily on professional and scientific sources that are available online. Google Scholar, Scopus, ScienceDirect and the TUDelft library website are used as main access points. The TUDelft main library and Architecture library are also used. These sources are used mainly for scientific literature published by universities and journals and in books. Professional literature is sourced mostly through Google and government websites both Dutch and European. Procurement law and practices are reviewed through law books, and issued guidelines and manuals.

The following search strategy (see figure: 3.2) is employed:

An open ended keyword search is performed using a distinct set of preliminary keywords:

The sources from this preliminary search provide additional keywords and additional secondary sources to be added to the list of references. In turn these secondary sources provide additional keywords and tertiary source material. This layered approach ensures both a comprehensive review as well as providing an increase in in-sight in adjacent fields of study. By checking the keywords of tertiary sources against the keywords that are used in the initial and secondary search the scope of the literature study can be verified. This process is further elaborated upon in appendix A

Narrative literature study

The initial phase of the literature study is meant as an explorative study and has culminated in a narrative literature review using key word searches as it's main search strategy. A narrative review aims to summarise and synthesise a comprehensive body of literature on a specific subject (Baumeister & Leary, 1997).

The initial search queries provided literature on cooperation in the construction industry (Doree et al., 2003),integrated product/project delivery effects on project success (Konchar & Sanvido, 1998; El Wardani, Messner, & Horman, 2006) and early contractor involvement.Limited sources where found, besides a

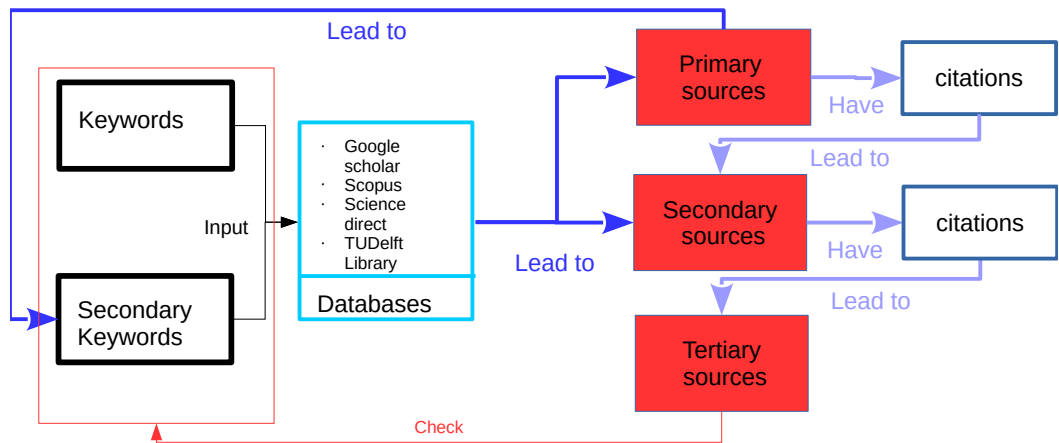


Figure 3.2: Literature research design

extended library by Hughes et al. published mainly between 2000 and 2006. Regarding procurement costs literature focusses on costs for the client prompting this research to make the distinction described in the scope section between procurement costs and tender costs. A secondary study or expansion with a more systemic nature was executed and is further elaborated upon in the following paragraph.

Systemic literature study

The secondary study utilised key words and cited sources from literature found in the preliminary study. This study supplied part of the secondary and tertiary sources mentioned in figure 3.2. This phase is more focussed on substantiating the notion that literature specific to the scope of this research is scarce and elaborating on possible elements in procurement methods and tender costs.

This part of the study utilises a more systemic approach. A systemic literature study has a research question of itself and utilises focussed searches delimited in time, subjects and sources (Baumeister & Leary, 1997).

This research is focussed on the time frame between 2005 and 2015 because both Hughes et al. (2006) and Dalrymple et al. (2006) indicate that little research was done before this time. The main focus lay on journal articles sourced through Scopus. Scopus was used because of the built in function of suggesting related literature with each article accessed. Within Scopus the search was limited to the physical sciences as to keep focus on the construction and engineering context.

The additional denominators of tendering and procurement as mentioned in the previous paragraph are used as main search queries, notably; transaction costs and project/process delivery methods. The second phase of the literature study shows that Dalrymple et al. (2006) also noted that Hughes et al. was alone in the research of tender costs and in systemic literature reviews performed by Naoum and Egbu (2015) and Ruparathna and Hewage (2013) no mention is made of literature describing a study into the influence of procurement methods on tender costs.

Professional literature did contribute to the influential elements uncovered.

3.1.2 Interviews

Semi structured interviews are used as an expansion to the literature study. The initial literature study failed in providing a detailed basis of elements within tender methodology and tender costs. The interviews are based on the meta-elements of contract form, selection procedure and award criteria found in the literature research. The interviews are meant partly as an addition to the literature research but mostly serve to answer the second and third sub questions. The interviews question the influential elements sourced from literature and due to their open format incite elaboration on the other influences contractors experience.

Interviews were carried out with people working at Witteveen+Bos and external parties, mostly contractors. The goal of this series of interviews is to extend the knowledge of the researcher in terms of the procurement practice.

There are several possible interview techniques that can be used, mainly differentiated by an open or a closed format. A closed format uses specific questions and offers a range of answers from which to choose. The benefit being that this allows for easy analysis of the answers and a better suitability for statistical analysis. This format is often used for validation purposes or hypothesis testing (Bernard & Ryan, 2009).

An open interview technique is more suitable for explorative research. An open conversation invites interviewees to elaborate on points, and allows for the discovery of new aspects of the subject matter (Bernard & Ryan, 2009). In open interviews the interviews can be structured or unstructured which collaborates more or less to the freedom expressed in the format.

For this study a standardised open interview technique is used so it remains possible to compare the answers of different interview candidates, while upholding an open format that allows for elaboration and exploration of new subjects (Bernard & Ryan, 2009).

The amount of interviews is determined by the desired operations to be performed with the data. For qualitative and explorative purposes the amount of interviews can be limited. Bernard and Ryan (2009) states that after 10-15 interviews the amount of new information gathered reduces significantly. This is enhanced by the knowledge level of the interviewees. In the case of this thesis all interviewees possess extensive knowledge of the tendering process and the costs incurred during this process. Therefore 10-15 people were interviewed.

Interview analysis

Transcribing the interviews generates a written datafile that can be analysed using qualitative text analyses techniques. Through a coding process, where sections of the text are renamed to represent themes or subjects, the overall data amount is reduced. Since the intention of this study is explorative a relatively inductive approach of thematic content analysis is used. Thematic content analysis is sourced from grounded theory where data is analysed with no or little pre-determined hypotheses or theories (Bernard & Ryan, 2009).

Through a manifest coding strategy in the first pass of coding explicitly stated elements of procurement methods and tender costs are coded. Coding

is an iterative process, and adding value coding, where interpretation of text sections provide codes (Bernard & Ryan, 2009), a comprehensive code book is created (see C.4).

This codebook forms the basis for analysis as an initial sorting of codes into higher order collections can take place. Through this process themes within the data are discovered that form the basis for theory development.

The process of conceptualisation utilises both the coding process and a process called thick description. Thick description involves forming a comprehensive understanding of the data by describing main codes in detail.

3.1.3 Expert review

Validation of the interview results takes place using an expert review. The panel consisting of participants in the interview. Using online focus group software the optimal setting for an expert review within the context of this study can be achieved. The online environment ensures that participants remain anonymous and allows participants to engage in the discussion without additional costs in travel time or other inconveniences of a real-life review session. This would aid the willingness of respondents to participate.

The review consists of a discussion part aimed at validating the results of the interviews and literature study and of several open and multiple choice questions aimed at quantifying the connections made in the causal map. The use of a communal expert review is aimed at utilising the discussion about the initial results of the interviews as well as discussion about the multiple choice questions. This results in validation through triangulation as well as certifying the saturation of data by checking the amount of new information that is presented with the codebook developed for the interviews.

In appendix D the discussion subjects are presented as well as the questions asked in the open and multiple choice section of the review. The process of validation specific to validation in qualitative studies is elaborated in appendix D.1.

3.2 Theoretical framework

A general theory behind tender costs is not easily formulated in part because of the lack of specific literature as mentioned by Hughes et al. (2005) and Dalrymple et al. (2006). The subject of tender costs has been mentioned, as said before in scientific literature, and studied by commissioned research entities.

The following theories show promise in aiding this research. Applicable theories are elaborated in section 4.3.

3.2.1 Procurement as governance form

Tendering as an economical tool is widely researched, amongst others by Holmes (1995); Koppinen and Lahdenperä (2007); Konchar and Sanvido (1998); Erik Eriksson (2007); Harding et al. (2000); Hughes et al. (2005); De Boer, Van Dijkhuizen, Telgen, et al. (2000) Each of these, and many other others focussing mainly on the subjects mentioned by Naoum and Egbu, being the impact on project succes and the issue of supply chain and lean construction.

Procurement is also seen as a tool to further an agenda varying from sustainability to working conditions. This does not contribute to the goals of this research. Therefore this theory is not utilised further.

3.2.2 Transaction costs economics

Transaction cost economics (TCE) are a means to identify costs in the closing and managing of contractual relations. This term was coined by Coase (1937) but famously expanded by Williamson (1979) and it has been used in much research since. De Schepper, Haezendonck, and Doooms (2015) uses it to convey tender costs in PPP projects. He states that in PPP projects, considering the amount of time incorporated in the contracts transaction costs economics can be used. This therefore seems to mitigate one of the objections of Hughes et al. (2005), who states that since construction works are geographically dispersed and require uneven distribution of works and assets throughout the construction period the governance structures mentioned in transaction costs economics to reduce and manage transaction costs cannot be implemented.

The theory of transaction costs economics hinges on the aspects of:

- opportunism
- uncertainty
- transaction specific investment

(Williamson, 1979)

These aspects influence transaction costs and their impact can be mitigated or reduced by implementing certain governance structures. Transaction costs economics seems to be a reasonable fit, since it hinges on the implications of opportunism in contracting stemming from information imbalance and asset or relationship specific contracting (Williamson, 1979) (De Schepper et al., 2015).

This means that when something specific is contracted a higher amount of certainty is required on both sides, since investment with no ulterior benefits need to be made. This puts a greater pressure on the contracts, increasing costs. This interaction between characteristics of assets, works and services procured and the costs of solidifying the agreements is contained in the concept of transaction costs economics.

3.2.3 Auction theory

A different economic theory revolving around price formation in closed auction bidding, proves to have merit for this research. The theory revolves around strategic pricing considerations when you do not know the price for which your competitors offer. This is the case in a tendering process, because there is a difference between the estimated costs of the project and the price offered (Hughes, Hillebrandt, Greenwood, & Kwawu, 2002). This difference is important in understanding that tender costs are also influenced by strategic considerations of contractors.

French and McCormick (1984) investigates this phenomenon with sealed bid auctions of oil fields as an example. The analogy with construction is that the total costs of construction are never known as is the total worth of the oil field, and the price is determined and contracted beforehand.

The consequence is that bidders must invest a certain amount of money in preparing the bids, and these costs are sunk as bids are not accepted. In normal economic approach sunk costs are recuperated in increasing marginal costs (French & McCormick, 1984). In both the construction industry as the oil industry this is not the case due to high uncertainty in availability of work and strong competition. The result is that there needs to be a difference in the price negotiated and the actual costs, larger than normal profits. This gap is the incentive for bid preparation and as such increases tender costs. The overall conclusion of the paper is that a client can expect to receive a price of:

$costs + normalprofit + industrybidcosts$

This illustrates that tender costs are fundamentally a part of the overall price and costs structure of projects. Secondly this means that when tender costs cannot be recovered in rising marginal costs, or added to the price, they eat directly into normal profits. This results in an unstable and unhealthy market.

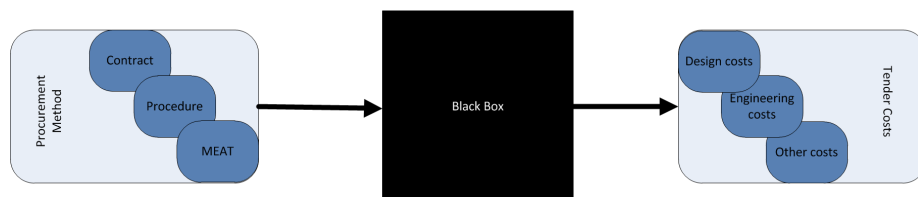
3.3 Conceptual Model

In this section the base conceptual model is presented. This model is the starting point of the research and presents both the assumptions and questions of this research.

This model is based on the researcher's knowledge, the initial literature study for the issue paper and conversations with people in the industry that supported the research question and problem statement made in the introduction.

The model consists of input and output. The mechanisms involved are represented as a black box. This is the case since the perceived influence of procurement methods on tender costs is unknown. In the iterations of this model, presented in chapter 4, 6 and 7 will expand upon the input and output parameters as these are the subject of the first two research questions. The mechanism present in the black box is to be determined using the interviews. At each iteration an expectation of the black box mechanism is presented, as to provide an overview of the process of research.

Figure 3.3: Conceptual model



The model shows, as is elaborated upon in the introduction, an influence of the procurement method, through some mechanism on tender costs. As gathered from the initial literature, the procurement method is a combination of the risk division in the contract, the procedure followed and the use of MEAT or not. The tender costs that are noted are design and engineering costs, as these are directly related to the task of providing a proposal and other costs. The purpose of the literature study is in part to expand upon these inputs and outputs. As is stated in paragraph 2.3.2, more costs categories exist, however the definitions are

formulated in part using the literature study. The conceptual model functions as a starting point in this research and insight from the literature study is not included. In order to show the progress throughout the research the additional costs categories are added to the model in chapter 4, as they are defined through the literature study.

The black box in this conceptual model is believed to be a causal scheme that works through products or tasks that need to be completed under the influence of the contract, procedure and use of MEAT and thus invoke tender costs.

Chapter 4

Literature study

Both the introduction and problem definition showed that the understanding of underlying influences on the perception of tender costs is lacking. Research has been done regarding procurement processes and costs associated with these processes.

This research focusses on the realm of procurement in infrastructural works in the Netherlands. Within this context integrated contracts regarding medium sized projects are studied, as stated in the introduction. In terms of the available literature, the field of procurement in general is vast, where the specific subject of this thesis is narrow.

The literature study aims to answer the the second research question as is discussed in section 2.2. To this end the literature study focusses on finding influential factors on the perception of tender costs within the applicable body of knowledge.

There are several aspects that set this research apart from the main bulk of research as this section will show. Firstly, this study is done from the perspective of the contractor, secondly it is a qualitative study so it deals with perceptions of cost aspects and influences and thirdly possible economic models and theories that may be applicable are not explored in depth, since these are based on quantitative studies.

This literature study is explorative and used to determine what aspects of procurement of infrastructural works effect tender costs and what those tender costs are. The initial research study used for the research proposal led to the conclusion that little literature was available on the subject of tender costs (as defined in this study) and the effects upon them.

This initial realisation, combined with an ambitious schedule, prompted the start of the interview phase. This changed in part the goal of the interviews by requiring the interviews to also contribute to finding influential elements. The narrow base this provided became apparent after the conclusion of the interviews. The focus in the research was so dispersed that the connection to the research questions was lost. Therefore it was concluded that additional literature study was required.

Reporting on the literature study, performed in two parts, proved difficult. After all, this process was unintentional. However the outcome does provide insight on two different levels that correspond with the goals of a narrative and systemic study.

In this light the literature study is presented as follows:

- A narrative study.
 - A narrative study gives an indication of the landscape of scientific enquiry in the subject.
- A systemic study.
 - The literature also provides insight in the influential aspects upon tender costs this part of the study is presented as a systemic study regarding influential aspects mentioned in literature. This part answers the first research question, and affirms the notion of availability of research stated in the narrative study.
- Theory.
 - The theories of transaction costs economics and sealed bid auctions as mentioned in section 3.2 are elaborated.
- Discussion.
 - Discussing the reliability of the literature sources.
- Conclusion.
 - Collecting the overall conclusions of both the narrative and systemic study and presenting the influential factors as questioned in the first research question.
- Model.
 - Presenting the first iteration upon the conceptual model, so it includes the conclusions of the literature study and the influential factors that are identified.

4.1 Narrative study

This narrative study aims to provide an overview of the literature available on the subject of contractor incurred tender costs in infrastructure projects and the aspects affecting this. In order to provide a full overview this study describes literature adjacent to the subject of this thesis and otherwise relevant literature as well. This study does not provide analysis or conclusions regarding the goals of this research.

The literature studied in this thesis is mostly published between 2005 and 2015. This coincides with the occurrence of integrated contracts that are cited as a catalyst or cause of tender costs issues in a lot of literature (Dalrymple et al., 2006) (Hughes et al., 2006) (Doree et al., 2003) (Ecorys, Van Zutphen economisch advies, 2015) (Hardeman, 2014), (De Schepper et al., 2015). The full search strategy for both the narrative and systemic study is elaborated upon in section 3.1.1 and appendix A.

Naoum and Egbu (2015) performed a systemic study regarding the available literature in procurement methods. Naoum and Egbu does not give a time

frame in which the literature he studied was published. Their study does encompass a larger subject field than this narrative study, interested in the effects of procurement methods. The study of Naoum and Egbu does not mention research towards the effects of procurement methods besides project performance. Research on the effects before the start of the project are either not found by Naoum and Egbu or are little researched in general.

This suggests that research regarding the effects on tender costs for the contractor is limited. Research is done however in the following fields that touch upon the subject of this thesis;

- Effects of procurement on project costs/success
- Procurement as a tool for furthering a certain governance agenda
- Client procurement costs

Hughes et al Research done in the field of tendering costs is mostly performed by Hughes et al. as is also implicated by Dalrymple et al. (2006) who states there is little literature by other authors. Research on; procurement in general, its practice and implications on projects success and other factors in construction is available.

In 2000 Hillebrandt and Hughes investigate theoretically what the costs of procurement are for clients, contractors and society. Different costs structured are found, but not utilised in the interviews as explained in section 2.3.2. In appendix A.1.2 an overview of tender and procurement cost structures is given. This is utilised in the analysis of the interviews.

It is concluded that procurement, especially in integrated or privately financed projects can hold significant costs to both contractors and society with benefits unclear (Hillebrandt & Hughes, 2000). The research of Hughes et al. (2006) and Hillebrandt and Hughes (2000) continued, resulting in research into costs assessment for the aforementioned tender costs. This research concluded with the observation that tender costs are usually regarded as overheads, and thus not monitored. This means that research regarding the size and impact of tender costs is more difficult.

In 2002 Hughes et al. published a study, regarding plans for developing a framework of costs assessment of different procurement routes. This is relatively in line with the intend of this research to develop an idea of the aspects influencing the perception of high tender costs.

Hughes et al. (2006) states as an overall result of his studies, that there is a possibility for procurement to be more efficient in terms of costs for both client and contractor. However he expects, and sees that the bulk of research and attention focusses on project success. Improvement in project success hold the highest financial rewards and are as such more interesting than studies regarding tender costs (Hughes et al., 2006).

Project success Most research focusses on the impact of procurement decisions on project costs and/or success. In these types of research procurement methods are often defined as a contract form being DBB, DB, DBM and PPP (Harding et al., 2000) (Konchar & Sanvido, 1998) (Koppinen & Lahdenperä, 2007). These papers focus mainly on the effect of the integration of building phases, citing benefits in project delivery time and budget control.

Erik Eriksson (2007) focusses on trust issues between contractor and client, trust needed for a more cooperative approach is often lacking due to adversarial tactics encouraged by competitive procurement method. These aspects can reduce project success by supporting time and costs overruns and reducing collaboration.

Konchar and Sanvido (1998) research delivery systems, as they call them, in the US. Differentiating construction management, design and build and design bid build as possibilities. Konchar and Sanvido state that the emergence of integrated contracts was due to inefficiencies and increased errors in design bid build processes. they studied, amongst other things, cost and schedule growth and delivery speed (Konchar & Sanvido, 1998). All of these factors impacted the overall project success, but whether new delivery systems altered the procurement process is not mentioned.

All of these studies do not mention procurement or tender costs as a factor at all. Not in determining project success or as a necessary costs to achieve project success.

Procurement as a tool Issues regarding supply chain improvement, lean construction and vertical integration are widely resourced and cited as instigators behind the shift towards integrated contracts (Boes et al., 2002; Boes & Dorée, 2008). Procurement methods can be used as a tool in achieving integration in the supply chain and improve lean project delivery (Ruparathna & Hewage, 2013). In this research a distinction is made in procurement methods and procurement policies. The latter focussing on award criteria and the former coinciding with contracting forms as also used by Konchar and Sanvido (1998); Harding et al. (2000); Koppinen and Lahdenperä (2007).

Costs to the client Most studies found that regard the costs of procurement are focussed on the costs to the client, either in selection of contractors by among others; Heijboer and Telgen (2002) De Boer et al. (2000) Costantino, Dotoli, Falagario, and Sciancalepore (2012) or in general by among others; Li, Arditi, and Wang (2012) and Rajeh, Tookey, and Rotimi (2015). The costs of selection is considered to be influential and choices in selection should be incorporated in the considerations of clients, yet no indication of the costs for contractors. The research into the general costs of procurement also makes no mention of costs to the contractor. Li et al. (2012) does mention contractor behaviour as an aspect affecting transaction costs. However she focusses entirely on the costs incurred by the client.

Research into transaction costs or tender costs in the specific case of Public Private Procurement (PPP) are abundant. De Schepper et al. (2015) and Soliño and Gago de Santos (2010) mention transaction costs in PPP structures as being high and recognise and suggest changes that would benefit contractors. De Schepper et al. (2015) mentions several interesting aspects, since he compares PPP projects to traditional public procurement . He does however not specify the nature of traditional public procurement. The study being from 2015 and regarding projects between 2005 and 2015, it is assumed that traditional public procurement means a Design Bid Build. The results of this study fall outside the scope of this thesis.

4.1.1 Conclusion of narrative study

The lack of mention of tender costs from the perspective of the contractor in these papers including the overview paper of Naoum and Egbu (2015) shows that the scientific community has not extensively studied the costs that procurement as a system inherently carries. Procurement costs for the client are researched but the bulk of research targets project success parameters. Hughes et al. (2006) and Dalrymple et al. (2006) confirms this finding.

With the advent of PPP projects some research research in procurement costs is more prevalent, including research in tender costs.

Overall studies in the effects of procurement methods mainly focus on contract form, or the degree of integration expressed in the utilisation of DBB, D&C or further integrated contracts. Tender costs are not a factor in the measurement of project success, or as part of the defined procurement method.

The most relevant study was that of Hughes et al. who's main conclusion was that even though tender costs could be significant they were deemed appropriate when pursuing increased value in the construction process. Hughes et al. (2005) concludes that a focus on tender costs in research is therefore not productive. This might explain why Hughes has not published regarding the subject since 2006.

4.2 Systemic study

The systemic study has a research question in itself. Providing a research question solely for the systemic study focusses the effort and allows for the presentation of tangible results. The research question for this systemic study is as follows:

Is research on contributing factors to tender costs readily available and what are the influential factors mentioned ?

This research question is analogous to the second research question posed in section 2.2. The notion posed in the narrative study that little research exists is incorporated in the research question of this systemic study. By challenging the notion through systemic study this conclusion can be confirmed.

The research has a specific time and subject framework that is searched as is elaborated upon in section 3.1.1. In short, literature from the period 2005-2010 is researched, regarding infrastructure with a focus on previously discovered key words like: integrated contracts, tender costs, project delivery methods, procurement costs, costs of procurement and transaction costs.

4.2.1 Availability of literature

This study found that research regarding the tender costs incurred by contractors was performed, contradicting the notion of the narrative study. With the advent of integrated contracts and voices in the industry that tender costs were indeed high the European Union, the Dutch government and some special interests groups have commissioned research to be done (Ecorys, Van Zutphen economisch advies, 2015)(Hardeman, 2013, 2014) (Strand et al., 2011). This shows that professional sources do offer insights in tender costs as experienced

by contractors. These studies in part cover the costs incurred by contractors, or suppliers in the procurement process.

Besides this professional literature, in academic sources Will Hughes of the University of Reading published, mostly in collaboration with Patricia Hillebrandt of the same university, a series of papers on the subject of procurement and tender costs between 2000 and 2006. This research culminated in a book called: Procurement in the construction industry (Hughes et al., 2006). Regarding the subject of tender costs and the effect upon tender costs the work was inconclusive. In 2006 Dalrymple et al. concluded that he was in fact the only one to have significantly contributed to the subject. In terms of scientific literature there is indeed little available.

Following the professional and academic literature the following section focusses on the contributing factors mentioned.

4.2.2 Influential elements

The reasons tender costs seem to increase as projects are further integrated is debated, and several suggestions have been made in the literature.

Hughes et al. research focussed on determining the amount and types of costs incurred in obtaining a bid-invite, drawing up contracts and designs and the overall process of submitting a bid. The main theory initially used for determining procurement and tender costs used by Hughes et al. is transaction costs economics, he later states that tender costs economics is not capable of explaining tender costs, more on this in the next section 4.3.

In this paper initial costs of selection and estimation of the price are included. They are, according to Hillebrandt and Hughes dependant on complexity of the work, the experience of the contractor and the opportunity costs of employees involved in selection (Hillebrandt & Hughes, 2000). All costs are ultimately dependant on the success rate, since costs of unsuccessful bids are covered by successful ones. The division of the cumulative tender costs is therefore dependant on the success rate.

Unnecessarily elaborate designs are mentioned by Lenferink et al.. These stem from the functional specifications used in the briefing and the qualitative manner of judging the tenders, also called MEAT.

Most research regarding the impact on tender costs is done by professionals and not academics. These studies, as is mentioned above, are commissioned by governments to monitor the effects of procurement legislation.

A main conclusion that is remarkable is mentioned in research done by the economic institution of construction. It states that the difference between a traditional contract or a design and construct contract alone made no difference in the tender costs (Hardeman, 2014). The main differences in tender costs indicated in the research by Hardeman are the use of MEAT as an award criterion, the size of the project and the procedure used for procurement.

This is remarkable since it seems logical that, since integration increases the workload per contract through adding aspects of the construction process, integrated contracts are in and of itself more expensive to tender. This presumption that further integration increases tender costs is shared by the Dutch ministry of Finance and the Roadworks administration (Ministry of Finance, 2010) (Ministry of Finance, 2012). Also Hillebrandt and Hughes (2000) do state that the more elaborate procurement methods are, the higher the costs of

procurement for contractors. Addition of services to building escalates procurement costs for the contractor.

It may be that since the research by Hardeman (2014) was done between 2009 and 2012 the advent of the economic crisis ensured that increases in the building costs estimation did not factor into increased prices. Because tender cost rise when, through increased market pressure, prices do not an increase in relative tender costs is felt that would not be otherwise. Hardeman (2014) may refer to relative tender costs in relation to prices or profits, but this is not stated explicitly in his research.

In other literature Ecorys, Van Zutphen economisch advies (2015) states that in 2014 68% of the tender costs incurred by companies can be attributed to demands or actions from the clients. Note that this is for all procurement done by public agencies in 2014. This is however still an indication that the behaviour of the client has a significant effect on tender costs. The effect on tender costs is partly because of the amount of design and calculative work needed in order submit a tender (Boes et al., 2002).

Current formats for both early contractor involvement as normal tender procedures require specific price points somewhere in the process. In order to acquire accurate prices a relatively comprehensive design is needed. This is work for which the contractor is ultimately not paid, even if the contract is won, since the contract only covers work described in the contract.

Even if such specification is not asked, contractor tend to still elaborate in order to feel sufficiently confident in securing the tender and to sufficiently quantify risks (Lenferink et al., 2013). This suggests an increase in tender costs in providing added design effort or costing details can be motivated by internal decisions. This extra work can thus be due to the choices of the contractor and not the client or specific method imposed requirements.

The manner in which the projects where awarded showed to be a major influence on tender costs. The use of MEAT versus awarding solely based on price increased tender costs on average with 42% (Hardeman, 2014). Since 2011 the use of MEAT as an award criteria has increased dramatically. From 20% in 2011 to almost 80% in 2014 (Hardeman, 2014). The manner in which MEAT causes increased tender costs is therefore an interesting study. Safe to say is that the award strategy, as part of the methodology probably has some influence on the perception of tender costs.

As mentioned by Hughes et al. (2002) there is a difference in estimation and price, where a strategic consideration is made. This suggests that the strategic considerations of the contractor have an impact on experienced, or perceived tender costs. If the difference between price and estimation is large, then perhaps estimation need not be as precise as was suggested previously.

One of the main reasons mentioned as a catalyst for the reduction in tender costs is the removal of red tape in the award procedure. Evidence pieces are requested later, and only from those selected, the process of tendering is digitised (Ecorys, Van Zutphen economisch advies, 2015). These savings underscore the importance of communication abilities in the tender procedure, and the fulfilment criteria for tender products. Other authors do not mention this aspect, a specific research into the new procurement law of 2012 by Hardeman (2013) did not include the conclusions of Ecorys, Van Zutphen economisch advies (2015).

Besides the influential elements upon tender costs, there is a wide variety of different cost aspects associated with the tender. As stated above a lot

of research has been done on client costs in procurement processes, and from this research some distinction of costs also associated with the contractor can be made. In appendix A, the different cost structures utilised in the research mentioned above is elaborated upon. Since the definition of tender costs in itself is difficult see table A.1, the definition of different cost structures is also difficult since every company will likely use a different structure. Encompass different costs under the total denominator of tender costs and so on. In the conclusion of this chapter the costs differentiation utilised in the interviews is stated.

4.2.3 Conclusion of systemic study

In answering the research question of this systemic study; Yes, research regarding contributing factors to tender costs is available. There are several different influential factors mentioned, expanding the range of inputs visible in figure 3.3. These factors can be grouped under project characteristics, methodology aspects, contractor and client behaviour and legal requirements. All factors taken into account in the interviews are presented in section 4.5.

The literature that is available is mostly professional research, that is executed on the order of governments reflecting on procurement legislation. As is also discussed in paragraph 4.4, the legislative changes are considered highly effective in these studies (Ecorys, Van Zutphen economisch advies, 2015). Scientific literature is lacking although through the research of Hughes et al. (2006) a basis for the interviews is available.

4.3 Theory

In the narrative and systemic study the possible influential factors are presented. In the narrative study the use of transaction cost theory by both Hughes et al. (2006) and De Schepper et al. (2015) is shown. These and other theories can contribute to the formation of the concluding theory of this thesis. Therefore this section examines two promising theories.

In scientific literature one of the main angles in which tender costs are viewed are using the concept of transaction costs economics (TCE). This approach is attempted by Hughes et al. (2006), and Hillebrandt and Hughes (2000) and used by De Schepper et al. (2015) and Soliño and Gago de Santos (2010) in studies on tender costs in PPP projects.

In general the costs of procurement in various forms is also studied by French and McCormick (1984) by studying the costs of sealed bids. Sealed bids concern the bidding for rights to perform certain activities. These bids are made without knowledge of competing bids or full knowledge of the value of the activities. In the study by French and McCormick (1984) oil drilling rights are used as an example. In procurement the actual value of the work is also unknown and the price offered can be considered a bid, making this theory interesting.

4.3.1 Transaction costs economics

In terms of recouping tender costs, Hillebrandt and Hughes (2000) makes an excellent point in stating that normal market conditions do not apply. Because of large fluctuations in demand and non-interchangeable goods offered in the

construction industry market equilibrium is never reached. This means that adding increased costs in the overhead of the construction companies is not always possible.

In 2005 the results of the above proposed studies were reported in a paper (Hughes et al., 2005) and in 2006 in a book (Hughes et al., 2006). Here the use of transaction costs economics is discouraged, because of location spread, demand fluctuations and finite construction time of each project. Each of these factors infringes on the normal reactions to transaction costs. This causes for example contractors to outsource when confronted with high transaction costs, instead of bringing works in-house, as is expected according to the general theory of transaction costs economics (Hughes et al., 2005).

TCE supports the construction industry mainly because procured works can be considered specific, with a large information imbalance between client and contractor (De Schepper et al., 2015). It would be expected that for recurring procurement, standardised contracts and vertical integration are used as a means to reduce tender costs. In terms of contracts tendered the process of integration does seem to indicate a vertical integration of building processes. However the vertical integration of the actual construction companies is lacking (Hughes et al., 2005), and in fact not a logical conclusion for the construction industry specifically. Hughes et al. (2005) Therefore states that transaction costs economics is unsuitable for determining the tender costs in the construction industry.

De Schepper et al. (2015) does consider TCE to be applicable. The PPP projects that De Schepper et al. talks about generally span a longer contractual period that traditional and D&C contracts may be influential. Longer time periods of contracting increase insecurities and lock in phenomenon and offer more potential for opportunism due to information unbalance. This creates more incentives to capitalise on governance structures that reduce costs induced by these phenomenon. In normal construction processes, the fluctuations in work flow and geographical location means that vertical integration of companies is undesirable. The long contractual duration of PPP projects mitigates this aspect. Often special purpose vehicles are created, that, because of the long contractual period PPP projects utilise the benefits of vertical integration on the company level.

Another influencer in the applicability of TCE in PPP projects is the inter contract spill over effects. This means that participation and execution of contracts provides economical benefits in other contracts ex post. This effect is mostly recognised in PPP projects (De Schepper et al., 2015) Also the advent of relational contracting and collaborative work forms is especially vivid in long term PPP projects.

In terms of the applicability of transaction costs economics in the scope of this research is debatable. The scope limitations of this thesis in terms of E&C and D&C projects combined with the focus of ex ante effects on tender costs reduces the applicable factors introduced by TCE.

Direct costs of the tender in terms of design, or document production may fall under the definition of Hughes et al. (2005). This means that transaction costs as a manner in describing these costs is illogical. These costs are deterministic and not influenced by the contractor. An increase in these cost does not contribute to the economic viability of integration in the construction companies. In normal market situations, according to TCE increasing transaction costs would be an

incentive for further vertical integration within the company.

However when talking about costs associated with trust issues mentioned by, among others, Erik Eriksson (2007), these costs do have an impact. They inspire different workflows, and operational procedures that transcend single contracts, thus moving beyond the limits mentioned by Hughes et al. (2006) and having more in common with the PPP projects described by De Schepper et al. (2015). These issues dealing with aspects of uncertainty in the contracting processes are identified by De Schepper et al. (2015) as procurement time (the time frame of the procurement process) and chance (the number of participants entering). These aspects are implemented in this study.

4.3.2 Sealed bid auctions

French and McCormick (1984) offer an interesting insight in sealed bid auctions. These are similar to tender procedures in construction works. Participants in the tender are not aware of the individual bids, and prices are based on expected profits that are unknown. There is a similar level of uncertainty in the turnover expected from a bid on an oil field (the example used in the paper of French and McCormick) and the turnover expected from the bid to build a piece of infrastructure with unknowns in workloads, weather or ground conditions etcetera.

The insight comes from the assertion that standard economic theory of price equals marginal costs does not apply in the situation described. As mentioned earlier, in the transaction costs theory paragraph, this also holds for procurement cases.

In auction theory it is assumed that participants want to recoup bid preparation costs and will hence offer *value of the bid - preparation costs*, but the value of the assets appears to be highly dependant on the assumption that you will offer the winning bid. In other words, the chance of winning.

The basic theory suggests (rephrased for the case of tendering infrastructure), that all participants assume their bid is the winning bid. This means that they can optimise their profits by offering a higher price. In this scenario tender costs are sunk costs, and should as such not factor into the decisions regarding the further tender. This means that losing the bid does not effect your profits, they remain zero. This is of course not the case, losing the bid does effect overall profits. Costs went into the preparation. The theory does hold an interesting narrative as to why the difference between estimation and price mentioned by Hughes et al., makes economic sense. When altering your bid to factor in profits, you lower the chances of winning, this can be construed as costs. Therefore it is concluded by French and McCormick (1984) that the marginal value of increasing your price should be equal to the marginal cost of doing so. Within these marginal costs, you can also take into account the costs required for optimising ones assumption of a winning bid.

Furthermore it explains how, even without standard economic theory the notion of marginal costs, still allows for the conclusion that tender costs should be recovered in a functional market. Thus exemplifying that if they are not, which appears to be the case, the market is in fact dis functional. This serves more as a support for the motivation for this research.

4.3.3 Conclusion of Theory

Transaction costs economics as a theory is applicable within the scope of this research. In terms of influential elements that are unrelated to direct costs influences, transaction costs based in uncertainty are expected to occur. These are aspects where the D&C projects discussed in this thesis are similar to the PPP projects discussed in successful applications of TCE.

From auction theory, conformation is derived of the notion that high tender costs are problematic. More specifically the notion that tender costs need to be recouped outside normal profit for a functional market to exist. Also it offers an insight in the strategic options contractors have in differentiating expected construction costs and price. This differentiation makes sense as long as marginal profit of your strategy equals marginal costs in lowering chance of winning and increased tender costs.

4.4 Discussion of sources

The findings that contracts matter ((Hillebrandt & Hughes, 2000)) or don't ((Hardeman, 2014)) in part oppose one another. This may be because of the time difference in the research. In 2000 integrated contracts were relatively new and experience over the past few years may have reduced costs that could be attributed to the difference in contract. Possibly the the data of Hillebrandt and Hughes differentiated on more than just contracts. In terms of the first explanation, contractors experience with tenders, or the age of the company does not effect the experience of increased time consumption in Tenders (Ecorys, Van Zutphen economisch advies, 2015). It seems that experience plays at most a small role in reducing the increased costs that are experienced. In the research of Hughes et al. there are many differentiations made besides contracts which can, and have impacted possible conclusions.

The research by Ecorys, Van Zutphen economisch advies and Hardeman was commissioned by government bodies and both praise government policies as main contributors to improved circumstances in procurement. This casts some doubt over the validity of this research. Also in both studies the data required was from 2009 to 2012. At this time the effects of the economic crisis were at their height. This results in a decrease in procured building volume, something that is not explicitly mentioned in both studies. Both studies claim that accumulative tender costs have reduced, and attribute this to improved regulation.

4.5 Conclusion

Even though it seems logical that the division of work and risk, in other words the contract, is a main influence, the research does not support this fully. However, that the division of risk plays a major role can be deduced from transaction costs theory. The division of risks feeds into uncertainties that can be addressed through additional work in the tender. Within the framework of procurement methodology the use of MEAT is frequently mentioned as an influential factor as is the focus on price. Determining the price, in greater detail, has inflating effects on design work, and MEAT requirements are often labour intensive

(Hardeman, 2014).

Besides the procurement method, the demands and actions from clients are mentioned (Ecorys, Van Zutphen economisch advies, 2015), this is also present in the demands for price point precision. Secondly, as stated by Lenferink et al. (2013), the contractor also makes decisions regarding the extend to which he/she wishes to provide in the demands of the tender. This means that contractor behaviour and decisions also play a pivotal role. Grouping MEAT, tender procedures, client- and contractor behaviour it seems the overall method of tendering seems to be the main reason for the experience of increased tender costs. The division of risks is mentioned but it's effect on tender costs is speculative and the manner in which risks are divided are part of the contract chosen. The total procurement method, and the definition for this thesis thus consists of ;

- Risk division
- MEAT criteria
- Selection and award procedure
- Client behaviour
- Contractor behaviour

In 2002 an attempt was made at assessing the costs, with a swift conclusion that it is extremely difficult to quantifiable asses the costs of procurement (Hughes et al., 2002). In this paper transaction costs are mentioned in the context of tender costs, stating that the theory has been used for organisational research into market relationships, but also reviewing the impact of risk division in contracts on tender costs (Hughes et al., 2002). Overall conclusion of the paper is that quantified assessing tender costs is an enormous task requiring vast amounts of data and a lot of cooperation of actors.

The exact division of tender costs in costs elements is therefore also very different. As stated by Hillebrandt and Hughes, tender costs are usually marked by contractors as overhead, however in 2006 Dalrymple et al. (2006) published his tender costs model, suggesting that tender costs are starting to be individually marked. No list of tender cost groups is presented as a question in the interviews. This is because participants need to be free to elaborate on their interpretation of costs they see as tender costs. In order to compare the answers to the literature an overview of tender costs groups is presented in appendix A.1.2.

In section 2.2 the research questions for this thesis are stated, the first of which is to be answered through this literature study. The research question is as follows

What are the influential factors regarding tender costs or the perception their off mentioned in literature

The factors described above are the influential factors mentioned in literature. The five factors mentioned contain a myriad of sub-factors, however the literature offers little insight into less abstract sub-factors that are a part of the influence scheme.

4.6 Model

In the literature study several elements are found that may contribute to the perception of tender costs by contractors. Looking at the conceptual model presented in figure 3.3, new inputs are found. Most notably client and contractor influences are mentioned by Hillebrandt and Hughes (2000), Ecorys, Van Zutphen economisch advies (2015) Hughes et al. (2005), French and McCormick (1984). They mention experience of the contractor, the use of MEAT criteria, contractor pricing strategy and more. These aspects all factor into the perception of contractors of the costs incurred by tendering.

A prominent addition to the model is the notion of uncertainty, based in transaction cost theory. As shown in figure 4.1 this uncertainty leads to changes in both the contractor and client influences. The uncertainty in participation of other contractors and the time frame of the tender influences the behaviour of contractors and clients. Contractors may try to quantify and mitigate the risks stemming from this uncertainty, leading to an increase in tender costs. Clients may also decide to incorporate more assurances in their demands and preferences which puts a higher strain on the contractors and their workload.

In the literature there is dispute on the influence of the contract, or as it is called repeatedly the project delivery system. It is in light of this notion in the literature that the scope of this research changed to only incorporate D&C contracts. Leaving alternative contract forms out of the scope, contracts are no longer part of the model. The differences in risk division between parties that can be present within D&C contracts remains part of the study and is part of the client influence as expressed in the model.

Figure 4.1 incorporates the new inputs found in the literature study. The model attempts to depict a neutral depiction of influences that form the perception of the contractor. Contractor behaviour is positioned outside of the black box. This way the full influential spectrum can be viewed. Also, the goal of this research is not to identify the behavioural patterns of contractors, but the external and internal triggers and influences upon the specific perception of tender costs.

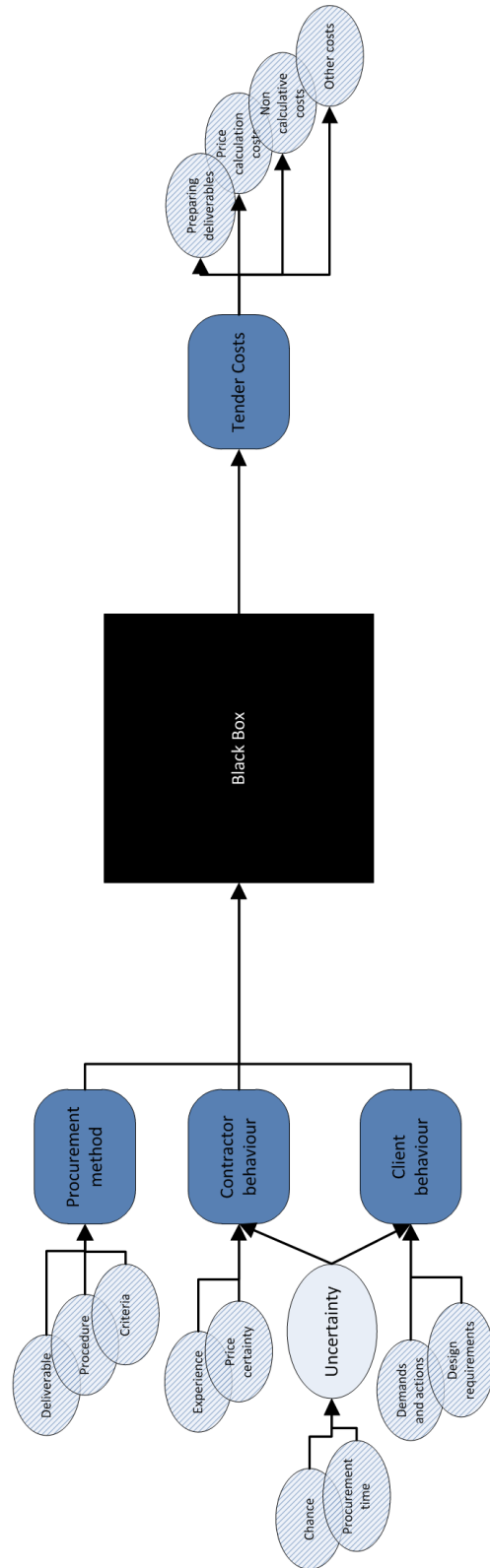
This incorporation of client and contractor behaviour to the model shown in figure 3.3 means that the black box is not a fully causal scheme. The inputs include strategic elements like; the certainty contractors have over the price they offer and the effort they put into achieving that certainty. Also uncertainty elements prevalent in transaction costs theory appear to have an effect.

A purely causal system in the black box would need defined actuators working on specific costs structures. However with strategic elements and 'soft' aspects like experience, a causal system seems unlikely. The black box depicted in figure 4.1, represents an influence network. The elements in the blue rounded squares influence to a more or lesser extent, choices and decisions regarding the output elements of tender costs. Within the black box it could be that the input parameters enforce each other or are cancel each other out. Overall there is a system in place that monetises these inputs into tender costs.

The content of the black box cannot be determined based solely on the literature studied. This is the reason for representing the system with a black box. Main focus of the research, as is represented by the research questions, is the input into the black box. The elements influencing the tender costs. Through the literature study this insight is provided, however the manner in

which this influence is exerted on the tender costs remains to be seen.

Figure 4.1: Theory model



Chapter 5

Interviews and analysis

In this chapter the interviews are discussed as well as the analysis of the data recovered. The results of the interviews are discussed in chapter 6. In the next section the process of interviewing related to the set up explained in section 3.1.2. The following sections deal with the analysis of the interviews and the produced results.

5.1 Interview set up

The interviews are set up in a semi-structured manner. The structure is provided by the interview protocol, displayed in B.3. This interview protocol allows for each interview to be comparable to the extend of the main subjects that are discussed.

The use of the interview protocol was satisfactory. In all interviews the subjects specified by the protocol were discussed. The order in which the subjects were discussed was not always the same across interviews. The flow of the conversation was more important than a strict adherence to the protocol. This is because the interview protocol was set up based upon a limited literature study, so it was expected that additional insight was to follow from the interviews. Restricting the flow of the conversation, in order to adhere strictly to the protocol, would reduce the incentive to expand upon the notions found in the literature.

A total of fifteen people were contacted with a request for an interview, of which twelve responded. Due to planning constraints eleven interviews were administered in between the 29th of June and the first of September 2015. Interviews are administered with project managers of an engineering bureau experienced in managing tenders and procurement procedures on behalf of both clients and contractors, and project and tender managers and management team members of construction companies with personal experience in the tender process.

5.2 Analysis

The analysis of the interviews is a very iterative process. Continuously going on during the processing and analysing of the interviews. The book by Hennink

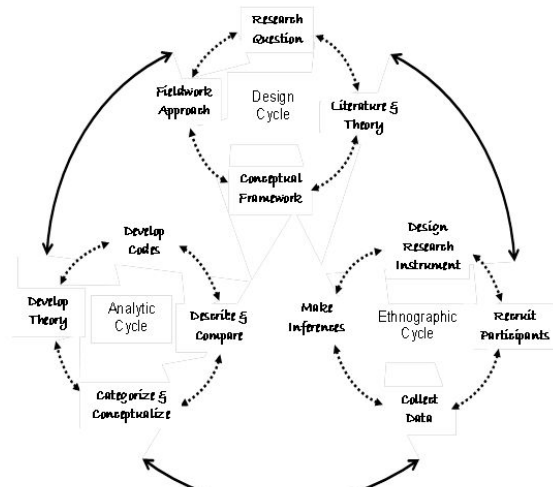


Figure 5.1: The Hutter-Hennink qualitative research cycle (Hennink et al., 2010)

et al. (2010) is utilised as an analytical aid following the steps of the analytical cycle that is part of the qualitative research cycle as presented in figure 5.1.

The cycle consist of describing, comparing, categorising and conceptualising the data. This process is iterative meaning that during describing concepts can form from description and descriptions can alter during conceptualising. This means that this process is thoroughly non-linear.

There are several forms of qualitative analysis as is elaborated in appendix C .The analysis of the interviews in this thesis is set up to be inductive. This means that the data is analysed without much pre-conceived expectations and no hypothesis to be confirmed. As the main interest of this study is to find out the unknown mechanisms of influence on tender costs this approach is better suited. Also the interviews are set up as semi-structural specifically allowing for participants to expand upon the questions creating data that cannot be deductively retrieved.

Analysis options that are used are thick description, categorising and conceptualising. All analysis is performed after and during coding. This results in the analytical model presented in 6.5.

5.2.1 Coding

The process of coding begins by hand-coding a representable portion of the dataset. Coding by hand, using coloured markers helps 'grasp' the data (Saldaña, 2012). This hand-coding is done on 4 interviews representing a little over a third of the total data. This amount is taken from Hennink et al. (2010) to be representable. This coding process produces a codebook that is used as the main analytical tool for coding all interviews. The used codebook is shown in appendix C.4.

The codebook is constructed using a mix of deductive and inductive coding. There are four code types used for this research differentiated by forming deductively or inductively and by forming from a question asked in the interview or

arising from analysis of the answers (see table 5.1). This means that inductive analytic codes arise inductively from analysing the answers or unprovoked statements in the interviews. This offers a different insight than deductive question codes that merely describe answers to questions asked.

Table 5.1: Types of codes

code type	description
deductive theory	A code based upon the expectations and information gathered from the literature study.
deductive question	A code that offers insight in the subjects covered by the interview directive
inductive question	A code that offers insight in interview questions that are prompted from the interview itself
inductive analytic	A code that offers analytical insight from the interview itself
in vivo	A code based upon a quote from the participant

Since the interviews are performed based upon the interview protocol certain expectations are inherent to the data. Based upon the interviews an initial set of deductive codes is used, that represent those aspects that answer to the initial expectations. These expectations were that the procedure, contract and deliverables would play a large role in determining tender costs. All the different tender costs that are identified following the literature study are taken coded for as to analyse what these costs are associated with.

Forming codebook represents the first step in analysis. Coding using the initial deductive codes was the first iteration of coding, some codes were added during this process, like the code "**Tender duration**". This was not initially part of the interview directive but became a staple question to ask, hence the inclusion as a deductive code. Other deductive codes stem from the literature study, such as the code "chance" which stems from the uncertainty principle of transaction costs economics mentioned by De Schepper et al. (2015) (see table 5.2). In later iterations of coding other codes are added according to inductive questions that are formulated during the interview and the initial analysis. These are inductive codes that are formulated during the second and third stage of coding of the initial four interviews. This is the first analysis, where statements made by the participants are transformed into codes that represent elements of the theory. For example the code "**Procurement organisation**" was formulated as a representation of the behaviour of clients and the influence of such behaviour upon the tender costs. Something that was not initially questioned or an expectation with solid basing in the literature study.

During the coding process the initial codebook shown in table 5.2 is constantly updated with new codes, revisions of codes and codes being deleted or merged with other codes. The first interview saw nine new codes added to the fourteen original and over coding the subsequent three interviews another nine were added. The nature of coding varied between coding direct responses to questions to in-vivo codes, coming directly from responses of the participants.

Formulating new codes and especially describing the codes means facing internal scrutiny. For example coding on the decision to enter a tender ("**entry decision**") and coding on the decision to invest in a tender ("**Investment justification**") seem relatively similar. During coding both codes have been deleted, reformulated, rephrased until in the description the distinction was made to differentiate entry from marginal investment and further more to focus the code "**entry decision**" on referring to actual decisions where "**investment justification**" refers to an investment viewpoint in general. This allows for a differentiation between influencing action and influencing a perception.

The basis of analysis after coding lies in providing a thick description of the code. Not all codes are processed in thick description. Some codes don't fit the purpose of this part of the analysis. For example the code "**Cost division**" describes the manner in which participants see tender costs divided in procedural influences or cost types. A thick description of this code does not aid the formation of higher order themes that explain the influences on those tender costs.

Through analysing the different text segments coded with a the same code and reiterating the description to best fit the intention and meaning of the different segments a maximum understanding of that part of the theory is achieved. More on this in appendix C.1,C.2 and C.3

The thick descriptions are formulated studying the quotes associated with the different codes. In this description the context of the statement is taken into consideration. This is why al quotes encompass a larger part of the text then the formative statement. This ensures the context remains visible. Since the data contains interviews with contractors and consulting engineers the description incorporates a comparison, if relevant. Furthermore the description focusses on describing noteworthy statements or overall conclusions that stem from the data.

An important aspect of all codes is their groundedness. The groundedness of a code is a measure of verification. Groundedness represents the number of times that the code is present in the data. The description from a highly grounded code is based on a larger part of the dataset, and thus holds more weight in the analysis.

Through thick description codes can be altered if the initial description given in the codebook is insufficient or does not do justice to the data. From the thick description the potential for splitting and merging codes becomes visible. In table C.1 in appendix C the thick descriptions of the super codes are presented. The code "**chance**" as presented in table 5.3 for example was split in chance:number of participants and chance:perceived MEAT opportunity based in part on the thick description.

"**Chance**" is initially described as influences regarding the number of participants in a tender (see table 5.2). Examining the quotes coded as chance this description the conclusion is drawn that this description is to narrow. Most notably chance is also seen as the way competitors measure up in terms of possibilities in the MEAT criteria.

Quote: *"We moeten iets onderscheidends hebben, en als we dat niet hebben, ja... dan is het kansloos. Iemand anders heeft dat....daar ga je*

vanuit, dat iemand anders dat wel heeft. Die heeft wel nadruk dat onderscheidend vermogen. ConInterview03

This shows that chance is not only determined by the number of participants in the tender but also their identity and the opportunities the contractor sees in fulfilling MEAT criteria.

The process of categorising and conceptualising higher order codes and themes does not stem solely from thick description as is elaborated upon in section 5.2.2. Coding in itself, and the formation of the codebook and its iterations also offers valuable insight in possible themes. This highlights the iterative process of qualitative research. Even though coding, categorisation and conceptualisation are presented as consecutive elements of analysis, they do overlap and feed back into each other. The resulting themes are presented in the results section (6).

5.2.2 Catagorising and conceptualising

Using the descriptions and the insights gathered from this analysis it is possible to categorise codes. In this process codes are redefined, split or merged as to both reduce the number of codes and come to higher order categories that can later be enhanced to themes. This categorising and conceptualising is the core of the inductive experience of theory development (Hennink et al., 2010). Through describing, categorising and conceptualising codes you offer interpretation and explanation of phenomena (Hennink et al., 2010). The connections between codes that become visible through the thick description and through searching for higher order aspects explain the behaviour of contractors.

Categorisation and conceptualising are interlinked in this sense, yet distinct. Where categorisation looks at the codes and at similar characteristics that prompt grouping these codes, conceptualisation looks at the entire dataset to develop a conceptual understanding of the underlying relationships (Hennink et al., 2010). Here the analysis moves to a higher level of abstraction towards the theory formation.

In this study categorisation is used on several levels. During coding and description codes are grouped together and split apart, resulting in several codes being demoted to sub-codes (see table 5.4). The code "**strategy**" is formulated to encompass the way contractors deal with their own decisions regarding spending on tenders (see table 5.4). During coding it soon became apparent that strategies employed by contractors encompassed more than differentiating spending patterns. Submitting a higher or lower price point on a tender, or proposing new engineering solutions also incorporates a certain amount of risk that is taken on by the contractor. This risk can be mitigated by a higher level of scrutiny in the tender. This is a different decisions from increased spending on more elaborate designs or presentations in order to increase chances in getting the tender awarded. By differentiating between the two you get a more comprehensive view of the different aspects of this behaviour. Using subcodes to make this distinction allows for a higher level of comprehension while the code "**strategy**" remains available for higher level analysis.

Table 5.4: Code and subcodes example

Code	subcode	type	description	example
Strategy	price-risk balance	in vivo	The manner in which the overall deal struck at awardance is in accordance with the mutual best interest of bussines continuation and project quality. Meaning the incorporation of construction risks in the price tendered	EngInterview02: "Dus ik denk dat de klant een betere oplossing krijgt, en ik denk dat wij over het algemeen een betere prijs hebben. Waarmee ik niet wil zeggen dat die prijs veel hoger is, maar hij is wel beter in balans met wat je meot doen, met je risciprofiel" blz 18
	strategy induces risk	inductive analytic	Describing the influence on tender costs of the risks taken on by the contractor by tendering in a certain way or to a certain extend in pricing, material amounts etc.	ConInterview03: "En vaak is het zo hoe meer geld je besteed aan een tender hoe meer risico's je kan vermijden maar dan gaan die tenderkosten weer gigantisch omhoog" blz 3
	strategy induced costs	inductive analytic	Describing the effect of contractors intentionally increasing tender costs for strategic reasons	EngInterview01:" Ja, dat is een afweging die de aanemer op een gegeven moment maakt van ja, hoe mooi, om over die 3d plaatjes, visualisaties, hoe mooi ga ik het maken, hoeveel kosten ga ik daar zelf dus insteken" blz.17

As was briefly touched upon in the previous section, starting from the code-book categories are made regarding the influential factor identified. This groups codes into themes being: Methodological influence, Client influence and Contractor influence. These three themes are complemented by themes regarding interesting data and cost elements. Throughout coding the remaining interviews and thick description these themes remained relevant and new codes were fitted within the context of these themes.

Through thick description new themes emerged shedding a different light on possible higher order concepts. Themes regarding the perceived opportunity, the cost and risk factor of the tender and the entry decision of the contractor played an overarching role in several codes. The discovery of these 6 themes and the way they support the developing theory is elaborated upon in appendix C.

The theme presented in table 5.5 originated from the formation of the code-book. During formation it became apparent that certain aspects that were often mentioned as influential relate to the decisions made and aspects under the control of the client. These codes differentiated between voluntary decisions such as "**risk division**" where the client determines how the different risks are distributed among the contractual parties to sometimes involuntary decisions like described by "**environmental lock-in**". This code describes how clients, having performed stakeholder meetings and taken into account the different environmental factors, are often limited in the freedom they can grant contractors in an integrated contract. These codes describe a profound influence stemming from the client showing a distinct divide in responsibilities between client and contractor in terms of influence.

The codes, categories and themes form the basis for the findings represented in the next chapter.

Table 5.5: Theme example

Theme	Client influence
Common attribute	Client voluntary and involuntary choices in procurement organisation
Group of codes	Risk division Tender duration Goal-Method discrepancy Procurement organisation Communication Real MEAT value Environmental lock-in

Table 5.2: Initial code book

Code	subcodetype	description
Tender costs	deductive question	responses to a question regarding tender costs
Tender compensation	deductive question	Responses describing the influence of tender compensation on decisions or tender costs
Contract influence	deductive question	A response regarding the influence of the contract form on tender costs
Procedure	deductive question	A response regarding the influence of the procurement procedure (public, non public, bvp etc) on tender costs
Deliverable	deductive question	A response regarding the influence of the production of tender deliverables on tender costs
price calculation	deductive theory	Describing something effecting tender costs through altering the costs of calculating the price offered for the tender.
Risk division	deductive theory	Describing something effecting tender costs through changing or acting upon the devision of risks between contractor and client
Non calculative costs	deductive theory	Describing something affecting tender cost through personnel and time consumption in non calculative or engineering tasks
Tender duration	deductive theory	Influences on tender costs instigated by the duration off the overall procurement procedure or changes therein
Chance	deductive theory	Influences on tender costs, or decisions made with regard to tender costs instigated by the number of people participating in the tender
consequence high costs	inductive analytic	segment describing the actions or thought processes of contractors faced with high tender costs. Actions and thoughts need to be directly and causally related to higher tender costs
Participant number	inductive analytic	Describing the effect of the number of participants in the tender or the mention of the number of participants as a part of the thought process
Strategic costs	inductive analytic	Describing the effect of contractors intentionally increasing tender costs for strategic reasons
External Costs	inductive analytic	Costs incurred by the need to hire external personnel/or expertise

Table 5.3: Thick description example

code	Groundedness	Type	Thick description
Chance	21	Deductive theory	Describing the influence on tender costs and decisions made regarding the number of competitors in a tender. This is dependant on the procedure chosen, but also on the business model of the contractor. This was brought up by consultant engineers as a process. Contractors stated that both the identity of competitors and the number was a determined in the decision to participate. Influences on tender costs were not mentioned. One participant mentioned a dislike of lottery's to reduce tender participants in a non public procedure. From the responses another element of chance is discovered. Contractors perceive the MEAT characteristics of a tender as being favourable or not, this means that this code is also describing the way that the perception of a favourable MEAT question influences tender costs made. Two influences were noticeable in the responses, mainly a decision to participate and the willingness to invest. An unfavourable MEAT can prompt an exit, however the decision to invest is described as a 'gut-feeling' as to the ability to be distinctive in the proposal.(connected to real MEAT value, and investment justification)

Chapter 6

Interview results

This chapter describes the results of the analysis steps described in section 5.2. In the following subsection the different findings from the thick description analysis and categorising and conceptualising are presented in order. The findings represent the train of thought in analysing the interviews. Following the findings the results are discussed. Since the interviews form such a vital part of the thesis, they merit a discussion prior to chapter 8, in order to appreciate the conclusions drawn in the subsequent section. The results of the interviews do not fully coincide with answering the research questions posed in section 2.2. Therefore the results of the interviews are concluded with an interpretation that answers to the second and third research question.

6.1 Findings

The analyses performed provided several findings that culminate in the formation of the analytical model presented in section 6.5. These findings are presented in order of abstraction. The findings that are based on the coding process hold the lowest level of abstraction. In the main report the three codes that are most grounded in the data are analysed. The other codes their description and quotes they are based on can be found in the final codebook in appendix C.4.

Coding and analysing the codes lead to themes, of which one is presented in table 5.5. The formation of the remaining five themes is presented in appendix C.3.

The main analysis performed on themes involves the comparison of influence ownership themes to influence reaction themes. This comparison is presented section 6.1.2, and appendix C.3.1. Following the theme description and comparison the formulation of the two concepts of **"influence ownership"** and **"influence reaction"** is presented in section 6.1.3. These concepts represent the highest level of abstraction that is reached in the endeavour towards theory forming. The theory formed is represented by the analytical model presented in section 6.5.

6.1.1 Findings from coding

The coding process including thick description forms a solid base of analysis and offers some interesting initial findings. A look at the three codes most grounded in the data gives some insight in the core of the findings. These codes are:

1. Tender costs
2. Strategy
3. Procurement organisation

Tender costs Obviously in an interviews regarding tender costs it is not surprising that statements regarding tender costs are most common. However, looking at the thick description the viewpoint upon tender costs describes their problematic nature differently then in the problem statement.

Yes, tender costs are generally considered high both relatively as absolutely, although not uniformly in on of the two but the design and engineering are not mentioned as often as expected. Design remains a high costs, but an unexpected differentiation is made. Calculation and design are uncoupled, and some contractors go as far as defining a tender design. This is defined as the minimal design required for pricing, differentiating it from the normal chain of preliminary design, definitive design, execution design. This creates two lines of influence; an added focus on pricing requires an extensive tender design increasing basic tender costs. While requests for elaborate designs such as a definitive design are mentioned often as influences in increasing superfluous tender costs.

These tender costs are deemed unessential as they do not contribute to price forming or better designs. Non calculative costs are considered high mainly because of the production of qualitative documents associated with a MEAT approach, where external costs are driven by a difference in company mission and capabilities and the tender. This forces contractors to hire external expertise. This means that contractors have to heavily consider entering tenders that fall outside their comfort zone as this generates external costs. Ceiling prices are mentioned often as a remedy for the unnecessary focus on price, reducing the need for an extensive tender design reducing design and pricing costs and allowing investment in quality.

Strategy The high level of groundedness in strategy exemplifies the importance of contractor influences. The employed strategy of the contractor plays a large part, as is visible from the thick description (see table 5.3 in appendix C) contractors are willing to invest in a workload in the tender beyond the minimum required by the procured question. Contractors see an advantage in investing extra resources in added security on price and technical detail or perceived opportunity, mostly in performing better in MEAT criteria.

This investment in added security sheds light on some anxiety with contractors in the risk division within integrated works. Especially combined with the expressed notion that a bad ratio of risk inherent in the contract to price is a common occurrence. The investment in qualitative aspects of the tender is seen as a positive development if this investment is sensible. It allows for lower securities on price, reducing tender costs here justifying the investment in quality. This investment in quality is perceived to also benefit the client.

Procurement organisation Procurement organisation is mentioned often as well highlighting a factor. This is notable since the influence of procurement organisation is stated to be outside the realm of influence of methodological or contractual choices, which were expected to have a large influence.

The main issue involves changes during the tender process, either changes in planning or changes in the question posed in the tender. These are most commonly mentioned followed by the information provided by clients. In this field two elements are mentioned, one a result of digitalisation where the supply of thousand of documents is possible, and the other in part from the risk division forcing contractors to provide their own basic information regarding ground conditions, basic measurements etcetera. This is expressed in statements that information received can be of bad quality interfering with the possibilities that contractors have in their design.

A third point introduces a split in the influences. Where the codes *"tender costs"* and *"strategy"* describe influences on tender costs, within procurement organisation an influence on the decision to enter a tender is visible. Brought forward mostly by engineering consultants who have experience organising procurement processes for clients; a lack of information regarding contract content, risk division and organisational aspects of construction during the selection phase can prompt the withdrawal of parties after the selection phase. This is damaging to the competition component of the procurement process and a waste of the resources committed to selection.

Results from other codes Besides these three codes, 21 other codes are described offering further insight into the perceptions of influence. In all of these codes a high focus lies upon the opportunity that contractors have for distinguishing amongst themselves in the tender. A highly grounded code such as *"real MEAT value"* describes the way contractors feel that proper differentiation is key to both better procurement results as responsible investment in expansive tender products. This underscores the results of the initial analysis that opportunity is key. Not to say that tender costs in themselves cannot be problematic. But codes such as *"goal-method discrepancy"* and *"deliverable"* highlight that the main issue is with waste and not with an increase in necessary aspects of the tender, such as added design and engineering tasks.

Conclusion from coding This leads to the main conclusion drawn from the process of thick description. The three most grounded codes introduce four application points for the influences, firstly and obviously tender costs, but also risk, opportunity and an entry decision. Some of these are explicitly coded like *"entry decision"* and others are expressed in multiple codes like in the theme *"opportunity"*. This contraction of codes into a overarching element is part of the categorising and conceptualising effort.

6.1.2 Findings from theme analysis

In this section the findings from comparing different themes with one another. By visualising the codes that are present in both themes an insight is given in the aspects that are mentioned with regard to both subjects, thus supporting the theory.

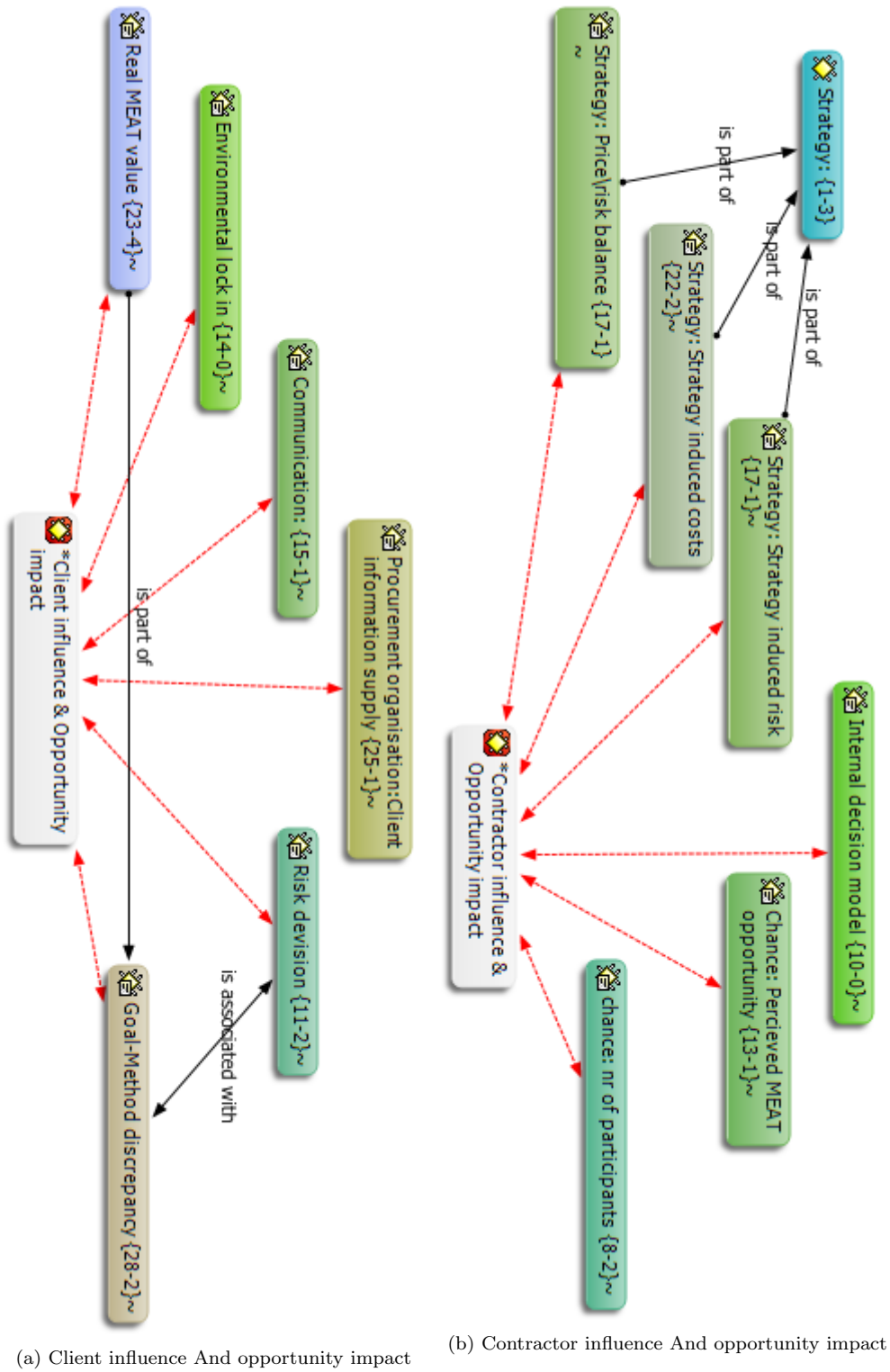


Figure 6.1: Shared codes within opportunity impact

The shared codes with opportunity impact of the client and contractor influences respectively offers several insights. Firstly it is apparent that the contractor holds, through it's strategy and internal organisation a significant impact on the opportunity perceived. However, there are some codes that also have an external component that are part of the shared codes of contractor influence. "Number of participants" and "perceived MEAT opportunity" are not solely within the contractors influence. This is mirrored in the codes shared with the client influences where two highly grounded codes coincide with "perceived MEAT opportunity". "Goal-method discrepancy" and "real MEAT value" and "environmental lock in" all correspond with the way in which the MEAT criteria are developed and how they represent opportunity for the contractor. In the client influence scheme of figure 6.1a we can see that these three codes are far more grounded with 28, 23 and 14 occurrences respectively. This shows that the manner in which the contract is awarded and the freedom that the contractor has in this respect is mentioned far more in conjunction with the opportunity perceived than the organisational aspects, that are also present.

Quote:

Nou dat tracebesluit daar zit ruimte in. he daar zit..en in die ruimte moet je het gaan zoeken. De zogenaamde 2+2 variatie die in het tracebesluit zit. In elk tracebesluit, dan zegt de raad zelfs van ja, denk erom....dit is een prof...dus je hebt een marge van 2+2....2 m zus en 2 m zo. Nou als je 2m zo mag als je onder de grond moet is dat best wel interessant. He dat kan niet altijd he, want er zitten dwangpunten in, je moet ergens onderdoor of overheen. Maar dan ga je wel proberen natuurlijk, dus bij Design & Construct werken probeer je nou juist inderdaad de kennis,kunde en ervaring van de aannemers erin te stoppen. Door te zeggen (onverstaanbaar....) joh dit kunnen we net allemaal even anders doen.. En daarmee probeer je je concurrentie te verslaan.

ConInterview03

Opportunity, as it is mentioned in the interviews, revolves largely around the possibilities of the contractor to provide it's own interpretation and apply their knowledge to the tender. In the paragraph on transaction costs economics in section 4.3 inter project spill over effects are mentioned as a secondary source of opportunity in tenders. This aspect is not part of the scope and was not questioned in the interviews. It is further discussed in chapter 8.

Analysing the other themes in relation to one another is elaborated upon more in appendix C.3.1. The results of which are utilised in the conclusion of this chapter.

The overall analysis of the themes shows that the main research question is insufficiently linked to the problem definition, as tender costs perceptions are not the central variable. Even though problems sketched in 1 seem to stem from a perception of high tender costs, they can also logically stem from a perception of low investment opportunity. This is a more complete explanation since this also includes the benchmark to which tender costs are measured. The mention of opportunity aspects, far out paces the mention of direct costs aspects. And many costs aspects mentioned share codes and quotes with opportunity aspects. The sources of perception are, congruent to the literature, identified

as client, contractor and methodological influences. However many quotes show the perception of influence to be upon the opportunity presented.

6.1.3 Formation of concepts

The categorisation starts during coding where codes are merged and split in the creation of the codebook. As presented in section 5.2.2 six themes emerge from the categorisation and conceptualisation analysis. These themes are elaborated upon in appendix C.3. An example of a theme is given in table 5.5, and the analysis of themes is elaborated upon in section 6.1.2, and appendix C.3.1. The process of conceptualising these themes has given rise to two concepts. The concept is the basis for the theory and represents the highest level of abstraction reached in this research. It is the full collection of quotes, codes and themes.

The first collection of themes arises from the coding process, as previously stated.

Influence Ownership

- Method influence
- Client influence
- Contractor influence

This concept highlights the perceptions of the division of responsibility in the problems sketched in the problem statement. A first observation is that, taking sub codes into account, the amount of codes associated with contractor and client influence is far greater than method influence. Contractor and client influences have 10 codes associated with them with 146 and 149 quotations respectively. Method influence consists of five codes and 119 quotes. The consistency of the themes can be seen in appendix C.3. Only one inductive code is coupled with method elements suggesting that the interviews did not entice the disclosure of other methodological elements or that all methodological elements are already deductively found.

The high number of codes for client and contractor influence together with the quotes embedded in these codes offers some valuable insights. Contractor influence is regarded high and important, especially the strategic aspects of the tender. Strategy is one of the most grounded codes as expressed above, and plays an important part in the influence of the contractor on tender costs.

This means that contractor influence is a main influence together with client influences. The influence of the procurement method is a lot less mentioned. This contradicts the models as they have been presented thus far. Even though, through the literature study, contractor and client behaviour were introduced to the model in figure 4.1, procurement method still remained as the most prominently featured influence.

The depiction in figure 4.1, shows the method, client and contractor influences as inputs into the black box. This remains the case. The suspicion that contractor influences are more pronounced than others cannot be verified. Because this is a qualitative study the only statement that can be made is that

contractor and client influences are mentioned in more detail and more often than method influences.

The second collection of themes arises from thick description and consists of of the following themes.

Influence reaction

- Entry decision
- Opportunity
- Costs/risks

This concept highlights the impact that the influences have and supports the finding that opportunity holds a central place in the impact of influences from the first concept. Opportunity has 14 codes associated with it and 198 quotes, far more than the 11 codes for the entry decision and 9 for the costs impact. The cost impact and entry decision have 147 and 159 quotes respectively. These themes are grouped together because they all describe a reaction that influences can have on the perception of tender costs in the broadest sense of the word. The formation of these themes is elaborated upon in the appendix C.3. Firstly the themes, though originally contemplated to provide separate insights are overlapping. The two collections of themes can be seen as more overarching concepts relating to **Influence Ownership** and **Influence Reaction**. These concepts interact. The different combinations of themes share a minimum of three codes.

6.2 Discussion

The interviews were held in an early stage of the research. Further literature study after the interviews made significant contributions to the theory and were not included in the interview protocol. The focus of the interviews thus laid on methodological influences on tender costs, as can be seen in the interview protocol in appendix B.3. The interviews therefore did not question uncertainty elements specifically. Also the lack of theoretical input before the interviews meant that the notion of strategic behaviour in pricing and costs estimation as expressed by auction theory was not part of the interviews.

The interview protocol was not updated or reiterated during the interviews. The skill of the interviewer and adherence to the interview protocol improved during the successive interviews but the interview protocol itself remained unchanged. This represents a lost opportunity to improve upon the depth of the interviews. The decision not to iterate on the interview protocol was made, because at the time of the interviews comparative analyses such as KWIC analysis (see appendix C) were expected to be performed. Changing the interview protocol between interviews was expected to reduce the possibility for comparative analysis.

6.3 Conclusion

The interviews are vital in this research and the data and from the interviews some noteworthy conclusions can be drawn. The initial assumption of direct relations between procurement method and tender costs is not supported. Even, the notion of tender costs as a central theme in the problem is not supported. Throughout the interviews remarks regarding differentiating ability, investments made and returns expected where manifold.

So it seems that contractors regard their work in the procurement process not necessarily as unavoidable "marketing" costs, but as well thought out investment decisions. This investment decision hinges upon opportunity versus risk/costs. This is a common representation of any spending dilemma in business. Procurement deviates from market conditions in the profound effect that the client has on both the opportunity as the risk and costs side of the equation, as is shown in figure 6.2.

Method, client and contractor all hold their influences but the second concept of the **Influence reaction** shows the central role of the contractor. They are the investors and ultimately control their costs. This leads to the very important notion that the entry decision is continuous, and can be revoked at any time. The effects of which are tangible and have in part sparked this research. In figure C.2 you see the difference in shared codes between client influences and contractor influences. This does suggest that the client holds a significant influence over the entry decision, which however always remains a decision of the contractor. The large amount of external influences suggest a separate influence on the entry decision regardless of the perception of tender costs or opportunity.

The notion of investment in the setting of tendering is not new, but judging from the interviews, more prevalent in the current era of integrated contracting than under the governance of traditional DBB. The centrality of contractor influence is also evident in the opportunity impact. It is shown in figure 6.1b that the codes regarding the internal strategy and organisation of the contractor are fairly grounded in the data and make up a the majority of codes that make up both themes. Furthermore looking at the shared codes in cost impact we see that the shared codes with contractor influences are far more grounded in the data (see figure C.1b)

The influences within the themes are represented in the codes as well. Client influences consist mostly of organisational issues such as planning and information supply where contractor influences focus on strategy. This strategy regards decisions on labour increasing winning chances or additional risks taken in the tender and in construction. The methodical influence is hardly mentioned, mostly in the sense that the procedure has relatively low impact although it is considered. Most notably some contractors have specialised in only participating in non public design and construct contracts nullifying the method influence.

Lastly the influences on opportunity mostly co-occur with codes that describe the freedom of integrated contracts. Client influences that coincide with the opportunity impact relate to the manner of awarding the contract and the arrangement of the MEAT requirements in relation to the goals of the client. Contractor influences on opportunity mostly revolve mostly around the internal organisation and strategy of the contractor. However, participation levels, and the perception of opportunity within the framework of the proposed MEAT characteristics plays a role. This coincides with the way client influences are

viewed.

6.4 Answering the research question

The interviews, as is described in this section give an insight in the manner in which the perception of tender costs is viewed. The notion of an opportunity/cost ratio as the central theme in contractor decisions remains as the main conclusion from the interviews. However this does not offer an answer to the research questions posed in section 2.2.

The first sub-question is answered in section 4.5, which leaves the following sub-questions to be answered:

Question 2:

How are elements sourced from literature experienced by
contractors in terms of their impact on tender costs

Question 3:

What are influences contractors experience in their tendering
process.

The elements from literature are experienced differently then initially expected. As explained in the model presented in chapter 4, it was expected that the elements are experienced through a network of influences. However, from the interviews it can be construed that influences work through a decision model. This is far removed from the assumption of the passive reception of influences by contractors in the previous models.

Secondly as is made clear, the impact on tender costs is a mute point in the overall discussion since, as stated above, tender costs are not a central theme. The decision model revolves around the investment and entry decision depicted in figure 6.2. These decisions form the basis for all aspects of the tender from the perspective of the contractor.

In answering the second research question: Elements sourced from literature are experienced by contractors as a reason to make decisions regarding their participation and investment in a tender.

In answering the third sub-question new influences come to light besides those found in literature. This is mainly the case since, the interviews offer a much more in depth view of the influences. This allows for a less abstract view of the influences felt.

In table C.1 you can find several of these more explicit influences. "*environmental lock-in*" is an interesting one, as it represents an influence falling under client influence. It represents the matter in which the client is free in determining his own demands with respect to pre-tender commitments made to stakeholders and other environmental aspects. This can be a hindrance to contractors as it constraints the freedom that is intended in an integrated contract. It could decrease a contractors willingness to invest in the tender. Depending on the business model of the contractor, the entry decision can be affected. Certain contractors have a specific focus in the projects they pursue and "*environmental lock-in*" suggest a highly specific product which may or may not be desirable by a contractor.

6.5 Analytical model

In this section the conclusion of the modelling structure is presented. This model is yet to be validated and possibly completed.

6.5.1 Model description

This analysis shows that a perception of high costs is balanced by the opportunities viewed by the contractor. Costs in this sense are therefore not an output variable in the model, as is presented previously, but part of the investment potential seen in the tender. This moves the opportunity/cost ratio into the black box. As the influential model is still unknown and it is only clear that the opportunity/cost ratio plays an important part in an otherwise still unknown mechanisms. Input still consists of the sources for costs perception as identified in the literature chapter. Contrary to the previous model iterations these sources feed into a black box culminating in an investment rather than a collection of costs.

The output of the model is the return on investment quotient gathered from the different influences upon the opportunity-costs balance, resulting in a sound investment. Three influences exist on this balance; the method, the client and the contractor itself. These are represented as rounded squares, as is the output in figure 6.5 . The balance governs two things: the entry decision and continued investment (represented as rectangles). These decisions move outside of the black box, as they are no longer an unknown. By including these decisions the connecting factor between input and output represents more of a decision scheme than an influence network.

The outcome is a sound investment made by the contractor . This sound investment can include significant costs in the form of the tender costs that in the previous model iterations were considered the prime output parameter.

The model depicted does not show the elements that make up the input themes, as the model depicted in 4.1 did. This is because the inputs are so numerous that depicting them in a single model would render the model illegible. The input themes of client, contractor and method correspond to the themes described above and elaborated upon in the appendix C.3. As you can see in table 5.5, the theme "client influence" has seven aspects that make up the input. In the previous paragraph an example is given of the impact of a single code in the depiction of influences in this model.

6.5.2 Proposed content of the black box

The black box representation of the previous models represented an influence scheme on tender costs. It can be said that the black box more closely resembles a decision scheme, based upon the investment opportunity perceived, represented in figure 6.5 as "opportunity/cost ". This opportunity/cost ratio feeds two main decisions that are constantly monitored, as is made clear by the interviews. The entry decision and the investment decision. The entry decision, once made after announcement of procurement by the client, obviously transforms into an exit decision throughout the project. As a representation in the static model of figure 6.2, this is represented as an entry decision that can be reconsidered.

The opportunity/cost ratio is influenced by the input themes of client influence, contractor influence and method influence. These themes consists of several factors that are represented in table 5.5 in this chapter and table C.2 through table C.6 in appendix C.3. As stated in the conclusion above, opportunity mostly consists of the characteristics of the MEAT and organisational aspects of both the client and contractor where costs are mostly influenced by organisational aspects from both client and contractor equally.

The opportunity/cost perception is in itself a complicated network of project characteristics and perceptions of the contractor. Unfortunately the interviews where not designed with research into the opportunity/cost perception in mind. This limits insight in this network. As is explained in chapter 8, the interviews where conducted prematurely. Therefore the actual perception network that makes up the opportunity/cost perception cannot be de constructed in this research. However in appendix C.3.1 a brief analysis into the cost and opportunity impacts and the entry decision is performed.

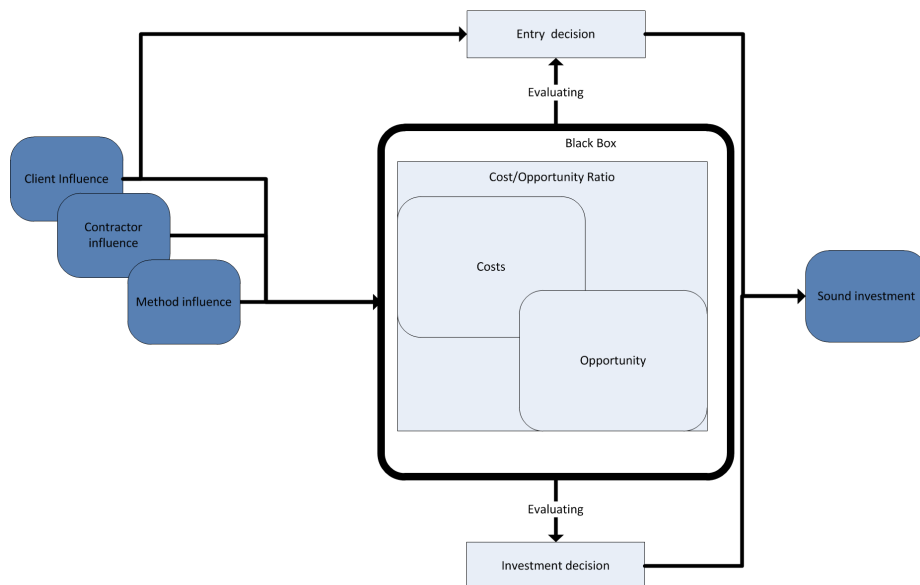
The current data supports several components for the opportunity/cost perception being:

- Perceived workload
- Price margin
- Perceived time consumption
- Risk
- participant organisations
- Project specific opportunity

All codes that are part of the opportunity and costs impact themes (see table C.5 and table C.6) can be construed as contributions to the project characteristics and perception components mentioned above. Throughout the procurement process contractors receive and produce more information regarding the project from the input themes. Increased workloads, time consumption and risk reduce the likelihood of a positive entry and investment decision. Better price margins, reduced risk and project specific opportunity increase the likelihood of a positive entry and investment decision. Organisational aspects in all participating actors can have both a positive and negative effect.

This description of the black box is a proposed interpretation of the opportunity/cost perception as it's main component. The research has focussed on the input themes, and therefore no claims can be made regarding the validity of this interpretation. More on this in chapter 8.

Figure 6.2: Analytical model



Chapter 7

Expert review

The previous chapters on the interviews provided the main conclusions of this study. In analysing the data provided from the interviews, researcher and other biases may have caused faulty analysis. The validation of the results is important in determining which results can be reported. Validation of qualitative studies is not generally expected as a necessity (Hennink et al., 2010). Qualitative studies rarely offer applicable results outside of their specific context and a main purpose of validation in quantitative studies is to ensure external validation. However research into the process of verification and validation of qualitative results is done and the merit of validation is defended in these pieces (Baxter & Eyles, 1997; Morse et al., 2002; Burnard et al., 2008). These sources are used to explain in short proper validation of qualitative studies in appendix D.1 and how the validation process in this thesis, described below, answers to this standard in appendix D.2.

This chapter entails the validation phase of the research. Using a focus group populated by participants of the interviews, the conclusions are validated. This validation through repeated exposure is called 'member check' (Burnard et al., 2008). In the following section the aspects of the explorative and formative research phases that are presented to be validated in the focus group are presented, following by an analysis. This analysis shows if and how these aspects are validated and how this translates to the model presented in 6.5. Conclusively the final model that supports the conclusions is presented. The validation process is divided roughly in two parts:

Firstly validation through a expert review. This expert review presents the findings to the original participants.

Secondly two control questions were introduced in the interviews, the results of this validation are presented in section 7.2.2. Also in this section the results of an independent validation interview are presented. This interview participant was not part of the original participants and enhances the credibility of the results.

Overall conclusions of the research are presented chapter 9.1.

7.1 Review set-up

The choice for a focus group set up for the validation is elaborated upon in section 3.1.3. This section elaborates upon the aspects validated and the practical details of the focus group.

The group consisted of four participants, all of which had already participated in the interviews. Two participants that were invited, that did not participate in the interviews cancelled at the last minute. One of these was interviewed after the expert review, the results of this interview are presented in section 7.2.2. Through the use of itracks© software, all participants were able to log in to an online environment. In both the trial and final focus group the process of logging in, and participating in the chat discussions proved to be easy. The focus group provided lively discussion as was intended.

The purpose of using a focus group setting was to obtain validation of the conclusions through discussion without asking directly, as to not influence the participants. Since the conclusions are the product of eleven interviews and the participants only have their own interview as a benchmark, it is important that they are free to relate the conclusions to their own experience. After discussions, multiple choice questions are asked to provide final validation for the conclusions.

The validation session focussed on the main conclusion and the two key concepts regarding the ownership of influence and the path of this influence. The total question structure can be found in figure D.1. Firstly the validation of the main conclusion

The possibilities/costs ratio perceived by the contractor is the main base for all considerations in the tender

The first concept revolves around the influences that act upon this main consideration base.

Concept A: From the literature and interviews it became apparent that contractor behaviour, client behaviour and the methodology chosen are influential.

The second concept revolves around the path through which these influences act. It is established that the decision to enter a tender is not always made purely based upon the possibilities/costs ratio. This means that there is a discrete path of influence to the decision to enter the tender.

Concept B: There is a discrete path influencing entry into the tender. This path is influenced by the client.

These aspects are broadly the main conclusions that are validated, through proposing statements, asking follow up questions and multiple choice questions to solidify the validation

7.2 Validation of interview results

Validating the main conclusion generated the most discussion during the focus group session. Generally spoken the notion is uniformly accepted by all participants validating the synthesis of this conclusion from the interviews.

Concept A, was also validated, however the high level of abstraction in the questioning made the questions poorly understood by the participants. The content of the three influence owners was not discussed and is not validated. The focus of the discussion quickly shifted. This generated other interesting statements but little substantiation for the validation of the concept, even though the concept was validated.

Concept B is partly validated. The existence of discrete influences on the entry decision is validated however the influences upon this decision are not validated.

The discussion generated some noteworthy other aspects these are elaborated upon in the following subsection 7.2.1, on the validation through the expert review. Next to the expert review, during the interviews several control questions where asked. These control questions offer some verification of the participants. Also one person who was invited to the expert review was, unfortunately, unable to attend. An interview with this person is performed and offers further validation since this person was not part of the initial interviews of chapter 5. This part of the verification and further validation is presented in section 7.2.2

7.2.1 Validation through expert review

This subsection holds some of the ulterior aspects brought forward in the validation.

Limited notion of opportunity The concept of possibilities as a grouping of among other things; differentiation ability, company/tender fit, expected profit margin etcetera, was unclear to the participants. The immediate reaction was a perception of opportunity as the chance to win the tender. This shows an attitude toward the content of the tender as being unchangeable, the strategic possibilities and differentiation in profit margin based on contractor decisions are not recognised. This is exemplified by one participants who states:

Quote:

Ik denk dat vanuit de marktsituatie aannemers zich vaak genoodzaakt voelen toch veel kosten te maken, zonder daarbij het uigesproken gevoel te hebben onderscheidend te kunnen zijn.

Con4 in validation

Roughly translated, Con4 states that: the market situation sometimes dictates investment, not the contractors own sense of possible differentiation.

After some prodding questions it is recognised that the expected return is an important part of the possibilities.

Inter project spill over The concept of investment within a single tender to increase the possibilities at the expense of costs or otherwise, was a familiar concept. However what became apparent more in the validation then in the interviews is the concept of investment in a single tender, when the return is expected in multiple future tenders. This goes beyond the scope of this research that focusses on a single tender, but it is telling for the development of the market. These long term investment decisions are a part of transaction

cost economics, and show that the picture sketched by Hughes et al. (2006) is changing, as this is one of the exact things he doesn't see.

Concept A

The second theme revolves around the input variables to the possibility/ costs ratio. They are identified as contractor, client and method influences. Since these broad aspects cover almost the entire spectrum of possible influences, the aspects of these influences that are deemed most important are used as an elaboration.

The first discussion revolved around the question what influences the participants see on the possibility/costs ratio. A question was used, because the spectrum of possible answers was too large to encompass in a single statement.

The discussion was brief and did not focus on the attended aspect. Instead it focussed on a myriad of different aspects that fall both within contractor and client influences. A subsequent question posed, designed to steer the discussion towards the owners of the influence stream did not really aid the discussion.

Client supreme influence A multiple choice question where the contractor, client and method influences were supplemented with their associated aspects validated the existence of these influences. The following discussion however resulted in a discussion about the limits of contractor influence and the large influence of the client. This discussion was fuelled by a misunderstanding about the question. The participants discussed influences on tender costs, where the question was about the influence on the opportunity/cost ratio. The discussion revealed that there is a strong focus with the participants on the client influences on the costs and efforts made by the contractor. Even when questioned directly on the possibilities for the contractor within the framework chosen by the client, the main focus was on possibilities of the contractor, to influence the client to alter the framework. All influence was put with the client.

Concept B

This concept revolves around the discrete influence on the decision for entry independent of the opportunity/cost ratio. This statement was met with positive reaction, validating the concept. Regarding influences acting upon the entry-decision the notion that only client influences acted directly was not validated. The other examples that were expressed can also be viewed as part of the opportunity/cost ratio. Further questioning did not validate whether this view is shared.

Because of time concerns, the following validating questions were posed in rapid succession. The last conclusion to be validated was the notion that the main entry decision takes place after selection and this is the only entry decision that is directly influenced. The latter part could not be validated but what was clear was that the entry decision and investment decision are constantly monitored and evaluated.

Conclusion

The previous model can be expanded through additional paths of influence towards the decision to enter the tender. The single path of influence from the

client towards the entry decision, as proposed in figure 6.2 is not validated. It is clear that the entry decision is influenced by all three influence owners, as well as some external influences that were not part of this study. Therefore in figure 7.1 all influences feed into the entry decision.

This study has focussed on the influences on the perception of tender costs. The main conclusion that tender costs are not at the heart of the tender experience remains and is depicted as the black box in the final model. In section 6.5 the content of the black box is debated. This proposed content was not part of the validation and is as such not shown in the final model. The grounding of this content in the data is insufficient to justify its inclusion in the final model, and the analysis of the black box is not the goal of this research.

Contrary to the previous model the codes that make up the different input variables are included. This underscores some of the conclusions that are presented in the next chapter in section 9.1. Some of these conclusions have been touched upon in the analysis of the interviews.

In figure 7.1 it is clearly visible that the presence of codes within both method influence and cost impact, opportunity impact and entry decision themes is scarce. This underscores that regarding the method influence there is little variety in the aspects mentioned as influential. The fact that the codes "Procedure" and "Deliverable" are highly grounded, with a count of 47 and 36 respectively shows that the method is mentioned often, only the contractor and client influences are considered far more varied.

The time frame of the tender process plays a vital role in the development of a contractor's perception of the opportunity/cost ratio. Obviously this perception is not fully formed from the procurement announcement by the client, even at the moment of awarding the tender most contractors are still debating the merits of the project. The continuous monitoring of the entry and investment decision is not depicted in the final model. In the validation discussion three key moments were discussed where all participants evaluate their participation in the tender as a manner of company protocol. These are:

1. Announcement of procurement
2. Announcement of selected candidates
3. Prior to tender deadline

These moments represent key parts in the process where efforts are scaled up, or enter a new phase where new costs and opportunities are present. All candidates agreed that these three moments are not nearly the total number of checks that are performed on the entry and investment decision.

7.2.2 Validation through control questions and interview

Besides performing an expert review that validated through member checking the interviews had several control questions built in. Also a final interview is performed with a participant that had not previously participated in the main interviews, and offers an outside view of the findings.

Control questions regarding the average tender size and the monitoring of tender costs were asked in all but one of the interviews. These control questions function as a bearing for comparability of the interviews. Since the scope of

this research is limited to average sized project, the question was asked what contractors considered average size. Secondly in order for contractors to have an idea of the influences on tender costs, tender costs need to be monitored to a certain extend. Therefore the question whether tender costs were monitored was also asked.

The different contractors had experience in contracts ranging from €10.000 to €1.000.000.000. However all agreed that an average project would range over €1.000.000 and below €100.000.000. This places an average project within the limits mentioned in (Hardeman, 2014) as to the influence of project size on proportional tender costs. Which falls within the scope defined in section 2.3

In terms of monitoring tender costs the answers given were very different. All contractors monitored tender costs to some extent. The minimal monitoring that was reported was a weekly evaluation of the external resources that were being used. The most extensive monitoring involved the viewing the tender as a project. This tender project had a budget with dedicated accountancy and monitoring and inter departmental invoices being issued.

Quote:

Als je een uav-gc met emvi hebt dan maken wij van te voren een tender-planning, van te voren een tender budget waardoor ook wordt geaccordeerd door de opdrachtgevers of door de interne opdrachtgevers, zeg maar de rayonmanagers of directeur

ConInterview10

This confirms that all participants in the interviews had sufficient insight in tender costs, with the minor exception of ConInterview11. This participant stated that costs are monitored only if they could be directly recouped as part of the tender compensation or if external invoices are involved.

Quote:

P: Nou.....eehm...in zover.....er wordt gemonitord wat er voor kosten zijn, als er ook een rekenvergoeding tegenover staat. I: dan wel? P: Ja, dan houden we onze uren er wel in bij. Staat er geen rekenvergoeding tegenover dan doen we gewoon mee en al die kosten....dat is gewoon eeh...dat zijn algemene kosten.

ConInterview11

The fact that estimates for average project size and the fact that tender costs were always monitored to some extent offers some validity to the expertise of the participants. It also means that the interviews can be compared providing the possibility for verification between interviews.

The interview performed was with a lawyer with extensive experience in procurement law and the assisting of both clients and contractors in the procurement practice. The interview was meant as an added validation by a participant who had not participated in the initial interviews.

The main concepts of the theory revolving around the ownership of influence and the separate path of influence on the entry decision were validated again in this interview. In that sense the interview did not offer many more insights yet

further confirmed the findings. However, some interesting observations were made, that feed into the recommendations of section 9.3.

Firstly, inter project spillover plays a role in the opportunity that a tender holds. This has been addressed in the literature and in fact in this chapter (section 7.2.1 as a key component of validation. According to the administered interview this holds true, especially for highly integrated projects such as DBFM(O). A key conclusion drawn by the participant is that new or expensive method items need to be part of a series. If this is the case, then contractors can improve their efficiency on these items, thus allowing for this item to provide the best possible opportunity/cost ratio to the tender. This does however mean that the use of costly items (either because they are new or have a high workload) is suitable for experienced procurators. It is stated in the interview that contractors are hesitant to participate in tenders by inexperienced agencies.

A second observation is that the impact of methodology is not nearly as large as initially thought. Being slightly contrary to the previous observation it does validate this notion as it is represented in the conclusion of chapter 6 ; Interview results. The method is mostly a starting point for contractors to begin their initial estimations, however strategic and commercial interest quickly overshadow the impact of methodological influences.

Conclusion

The interviews performed are comparable in terms of their view on average project size and the knowledge of the participants on tender costs and the influences upon them. All participants reported that tender costs are monitored to some extent.

The validation interview further validated the results of the interviews and provided some additional insights. The method influence is indeed low, but coupled with inexperienced procurators they can be influential. This fits with the importance of procurement organisation that is mentioned in section 6.1.1. Also the notion of inter project spill over is once again mentioned, suggesting that repeated instances of expensive methodological elements over different tenders aids in their acceptance.

7.3 Final model

The final model shows the two concepts as defined during the interviews and validated in the focus group. Concept A showcasing the ownership of the influence on the opportunity/cost perception and is depicted as the input of the model. The inputs are encased dark blue for inputs into the opportunity/cost ratio and light blue for input into the entry decision.

The main conclusion constituting concept B is the opportunity/cost perception that influences the decisions in square boxes, to continue investment and to instigate or terminate the participation in the tender. The decision to participate in the tender is continuously evaluated and also independently influenced by the three input themes.

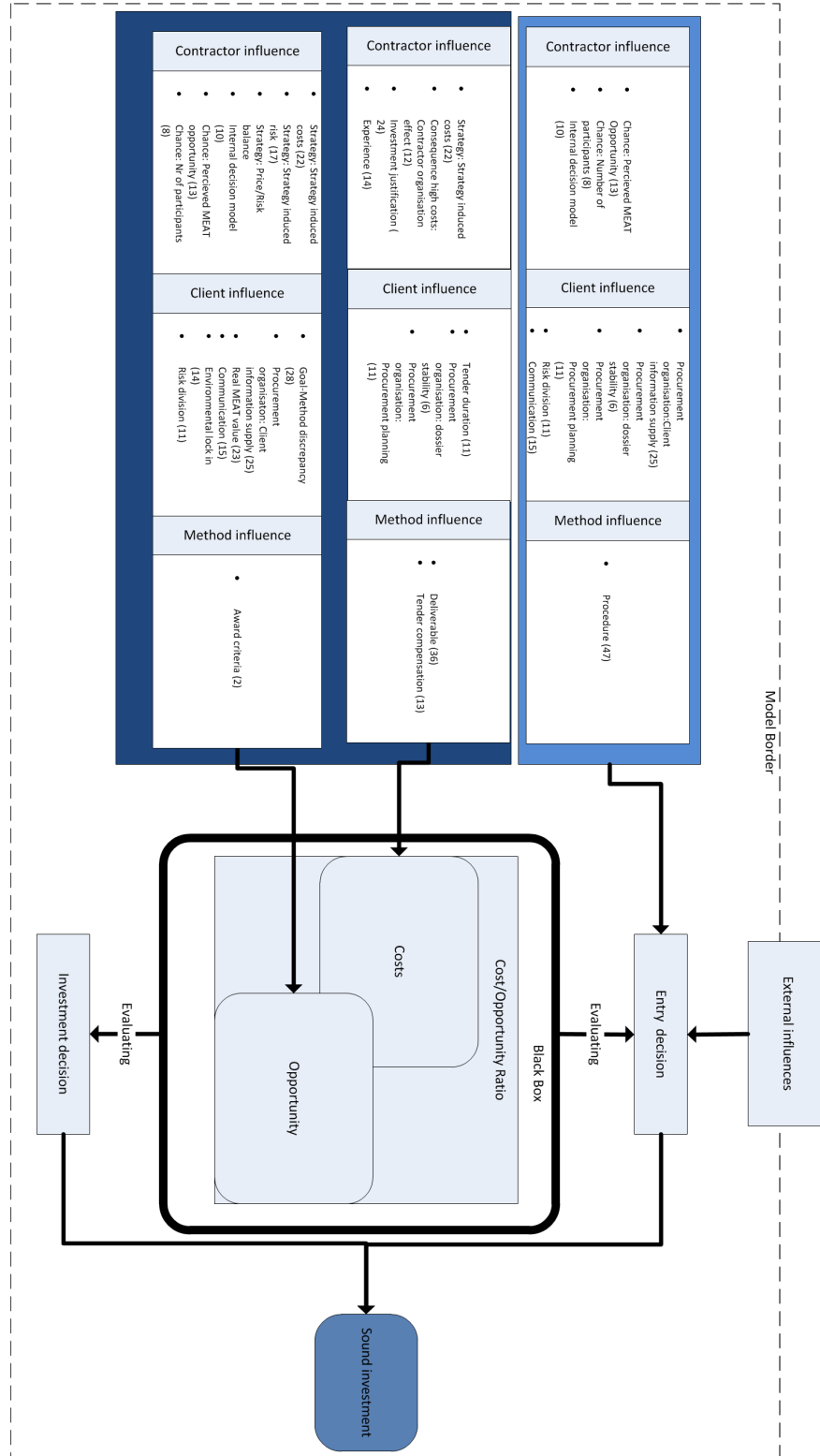
The input section shows the vast array of codes that make up the themes. Utilising the theme comparison analysis shown in section 6.1.2 and appendix

C.3.1 the model shows the codes that are utilised in both the influence ownership theme and influence reaction theme.

Above and below the depiction of the black box, with the opportunity/cost ratio as the only known part, the decisions that drive the tender are depicted. These decisions are part of concept B, as presented in section 6.1.3. The entry decision and investment decision are depicted outside of the black box. This exemplifies their validation in the expert review. The differentiation between influential elements and parts of the perception network within the black box proved difficult. Therefore the black box, as presented in figure 7.1 consists solely of the opportunity/cost ratio.

The sound investment which is the output of this model, depicts the result of the tender procedure. Obviously for many tender procedures the result is not a sound investment but a discontinuation of the tender or a bad investment even. The scope of this research limits it to within the time frame between announcement of procurement and the awarding of the tender. At that point all participating contractors present what they feel is a sound investment, otherwise they would have reconsidered the entry decision somewhere earlier. Therefore the realisation that this judgement is wrong and the tender does not turn out to be a good investment or the realisation that the tender is lost falls outside the scope. Both instances do not diminish the perception of costs/opportunity for the given tender, and are therefore not depicted in the model.

Figure 7.1: Final model



Chapter 8

Discussion

This chapter summarises the results of this research focussing on the addition this research has made to the field of construction management. In addition it offers a reflection upon the qualitative nature of the research and the manner in which the literature study and interviews were conducted. In the next chapter the conclusions and recommendations within the smaller context of this research are stated.

8.1 Contribution to the field

One of the main parts in which this research contributes to the notions of (Hughes et al., 2006) is that in the case of single tenders for D&C and E&C contracts transaction specific costs are present and represented strongly by uncertainty principles in contracting. This would coincide with the applicability of transaction cost theory as it is utilised by De Schepper et al. (2015) in the case of PPP. Where Hughes et al. (2005, 2006) focusses on the lack of vertical integration to mitigate direct costs, to dismiss the use of TCC this does not compute with the results of the interviews. It would follow that the discussion of tender costs in the interviews would focus on the costs of contract management and arranging external labour sources. However, the main concerns expressed in the interviews refer mostly to the opportunities aspect, focussing on indirect costs. These take up a small part in the research of Hughes et al. (2006) causing him to dismiss the use of TCE. This could be because the bulk of the research done by Hughes et al. is done before 2000 where a different environment regarding integrated contracts and applicable tender costs exists then today. Today the integrated contracts such as D&C and E&C have more in common with PPP projects, as in their more unified contracting structure. This aspect was not questioned in the interviews, and can therefore not be validated. However the mention of inter project spill overs which are directly related to TCE supports the notion that TCE can be applicable to D&C and E&C contracts.

Besides this, the research offers a new viewpoint for future research into tender costs. The opportunity within the tender is poorly understood and extends beyond the expected value of the project. This viewpoint allows for cost/benefit analyses that can strengthen the case for TCE and provide new governance structures for both contractors and clients.

8.1.1 Theory formation

The use of transaction costs theory, incorporating inter project spillover effects provides a relevant viewpoint on the tendering practice. In this viewpoint the notion that costs/opportunity is key. This can be the basis for the formation of a regular economic theory based upon the expected return on investment using transaction costs economics to explain the inter project and project specific cost structure.

The model presented in figure 7.1 represents the theory expressed in the main conclusion of chapter 7. As is expressed in the appendix C.3 the input factors, the main theory (represented by the oval shape) and the entry decision correspond with six themes evaluated.

The overall theory states that contractors within the scope of this research are moving towards an investment strategy in the tender as opposed to a minimal cost strategy. This has major consequences for the governance within the procurement of infrastructural works.

The entry decision is a main concern for clients as it is apparent that finding enough participants in the tender can be troublesome. This is elaborated upon in the problem statement and confirmed in the validation interview. For clients this means that providing less incentive to reconsider the entry decision is in the interest of maintaining competition within the tender. Addressing the opportunities side, and investing in communication, information supply and correct use of methodological elements is key in this regard.

The investment decision is, underused by contractors. There is a lot of potential savings in adjusting the investment level according to the feedback received within the tender, and the experience of the contractor. Utilising the contractor's own strategic and organisational influence contractors can monitor the marginal costs of their efforts and the marginal profit it offers, thus achieving a better costs/opportunity ratio.

The application of this theory is presented in the recommendations of section 9.3.

8.2 Reflection on the research method

The realisation that transaction costs theory is applicable brings into contrast the value of the literature study in this thesis. The study was initiated with a very narrow viewpoint and thus fostered view results. After a search strategy, as is presented in figure 3.2, was adopted more literature was discovered. However the interviews had already taken place.

The split in a narrative and systemic part is instigated by this split in unmanaged search and managed search that occurred. The unmanaged search unearthed a lot of literature adjacent to the subject of this thesis. In order to present this research and also incorporate it in the analysis of the interviews a narrative approach offered the most possibilities.

The narrative study offered an intriguing look into the research that was undertaken and through the research it was possible to firmly establish the position of this research. The narrative study showed a lack of research from the contractor' perspective, which this study has provided. Secondly it shows the contradiction inherent in the lack of research even though the potential and

actual problems associated with high transaction costs are mentioned.

The systemic literature study evolved from researcher according to the search structure. This was initiated because the initial goal of identifying influence elements was not reached. Through this research, some literature was found regarding the impact of procurement methods on tender costs like Hardeman (2014) and Ecorys, Van Zutphen economisch advies (2015). This being research commissioned by governments to evaluate their policies some results are questioned. As is mentioned in 4.4 the high focus these reports lie on government actions that have reduced tender costs raises questions.

The interviews do confirm that the reduction in documentation that needs to be provided, mentioned by Ecorys, Van Zutphen economisch advies (2015) does seem to aid in the perception of tender costs. However, as becomes clear from the formation of themes, other aspects are mentioned more often, to such an extent that legal issues are not recognised as a code. This research thus offers a different insight where more control is placed with the contractor as opposed to the purely regulatory approach of the research by Hardeman (2014); Ecorys, Van Zutphen economisch advies (2015). However in retrospect the lack of a legal viewpoint to the influential elements, or a legal element in itself is a missed opportunity for this research. In the final validation interview a mention was made of the duty to warn that contractors have. This duty to warn applies not only within the project but also in the tender phase. This puts an added strain on contractors to thoroughly examine all materials submitted. This aspect is not researched in this thesis and could provide additional inputs for the model.

The interviews were initiated, as stated above, based upon a limited research study. As can be seen in the interview protocol in appendix B.3 the focus lies upon the initial influence aspects that were discovered:

- Contract
- Procedure
- Deliverables

The interview protocol was not altered in between interviews even though this is advised (Hennink et al., 2010). This was because the skill of the researcher in terms of interviews did not yet allow for a thorough evaluation of the retrieved data. Also the limited literature study also meant that the focus of the study, at the time of the interviews, was different then it is now.

The interviews in the end proved to provide valuable insights despite them being designed for a different research goal. This is due to the use of a semi-structured format. Within this format the subjects mentioned in the protocol are just guidelines as is elaborated upon in 3.1.2. The interviews remained compatible and elements that were not part of the protocol such as "*strategy*" turned out to be valuable insights acknowledged in multiple interviews.

Even though the interest for tender costs, beyond mentioning its existence and importance, is relatively scarce, as shown in the literature. It is there. Also in professional literature this aspect is recognised and studied. However the theory of this thesis suggest that a broader view is needed in order to ensure a more favourable perception regarding tender costs. Both contractors and clients have the opportunities and entry decision as points of influence. This offers a lot of potential for future policy changes from both parties, as is expressed in 9.3

8.3 Personal reflection

This research did not proceed entirely according to plan. The literature study was initially fragmented and the interview preparation was incongruous with the current purpose of the study. However results were made, and the conclusions drawn in the following chapter have a sound basis in the data and the literature studied.

This study was started with a very ambitious planning. This schedule turned out to be unmanageable. The choice was made to proceed with the interviews without a fully formed research question and accompanying literature study. This proved to be a big set back for this study resulting in the need to sort of reverse engineer the research goals based upon the data collected.

Had the preparation been more extensive it could have been possible to devise more specific questions and perform a quantitative study into the effects on tender costs, or the realisation of opportunity in the tender. Theories on transaction cost economics and closed bid auctions, if incorporated in the interviews would have provided a great opportunity to describe the tender in an economic sense.

The spirit of the research remained intact however and even though the focal point shifted through the period of research the goal of understanding tender costs remained.

8.4 Applicability of research

In the applicability of this research one needs to be careful. The focus has been on D&C contracts, but as is also expressed in the interviews. The label on a contract is just a label. The contract itself can have a multitude of different interpretations so statements regarding D&C as a contract form need to be broad.

The conclusions drawn so far are only internally validated. This means that no statement regarding the general population can be made. This was not the intend of the research, but it is advised to read the concluding chapter aware of this limitation.

Tendering in the construction industry is a highly competitive environment. This means that subjects interviewed have incentive to refrain from giving information or to provide false information. In this thesis, utmost care is given to providing an environment where participants can speak anonymously and freely. Both in the interviews as in the validation group session. However, especially in the group session, the responses may not be as candid as desired.

By focussing on medium sized contracts in infrastructure this thesis has a specific context that only describes a small part of the infrastructure sector. As described in the scope 74% of companies in the infrastructure sector probably don't fall under this context. This reduces the applicability of the research for as far as it is transferable. Transferability as an aspect of validity is explained in appendix D.

8.5 Additional remarks

As became clear through the narrative literature review in section 4.1, the research on the specific subject of the influence of procurement methods on tender costs is scarce. Hughes et al. (2006) states as the conclusion of his six year research that this focus is unproductive. The amount of tender costs is insignificant compared to the costs associated with project success and benefits incurred from improving project success. Hence, most research will focus and has focussed on these area's.

Since 2006 the advent of integrated contracts, to the extend of DBFM have seen a rise in of tender costs, consequently enticing research in PPP structures such as De Schepper et al. (2015) and Soliño and Gago de Santos (2010).

In these studies transaction costs economics is used as a theoretical basis, as was attempted by Hughes et al. a few years earlier. As is discussed in 4.3 he concludes that transaction costs economics are not a viable basis. De Schepper et al. (2015); Soliño and Gago de Santos (2010) conclude that it is, and in the light of this research I tend to agree with the latter.

The viewpoint of Hughes et al. (2006) and other researchers that touched upon the subject, excluding PPP projects, is one of tender costs as being solely a burden. From a viewpoint of tender costs economics, the notion of investment to further future income through tender is logical. In the current situation there is mention in both literature on PPP project as in the interviews of inter project spill over as De Schepper et al. (2015) calls it.

This notion of inter project spill over is not mentioned often in the interviews, however in the validation it is. Also the notion of inter project spill over fits within the theory of intrinsic opportunity within the tender. For this research, that focusses on single tenders, this falls outside of the scope. However it is an indication that the use of tender costs economics as a theoretic base to describe governance reactions in the wake of the experienced tender costs is valid. Inter project spill over also offers an interesting starting point for determining the intrinsic value of the tender in future research.

Chapter 9

Conclusions and recommendations

The following seven conclusions can be drawn from the literature and interviews. The first four of these conclusions were validated during the focus group sessions discussed in chapter 7. The first six conclusions were part of the validation while the seventh was not but is still considered to be interesting enough to mention. Following the conclusions, recommendations are made for both client and contractor based on the theory of contractor perception developed.

The primary three conclusions regard the notion of the perception of a opportunity/cost ratio as the primary point on which the input of client, contractor and method influences apply. The implications of these conclusions is that both client and contractors can significantly impact the costs/opportunity ratio and improve upon it in their own right. The delicate balance of participation in the tender is made clear which suggests that a procurement process needs to be executed with full awareness of its implications in both costs and opportunity for the contractor. The remaining conclusions follow the main three and share in the implications which are not elaborated further. Following the conclusions the main research question is answered and some recommendations for both clients and contractors in dealing with the implications of this research are given. This chapter ends with final recommendations for further research.

9.1 Conclusions

Conclusion 1

Tender costs are not considered a sole criterion in considerations of contractors. Tender costs are viewed in tandem with opportunities, making the main impact point for external and internal influences within the tender the perceived opportunity/cost ratio for the contractor.

Validated

This main conclusion is supported by the interviews. Following the analysis of the thick description of codes, opportunity aspects are mentioned often, and form a close relation with costs aspects. The conclusion is supported by the high groundedness of the code *"strategy"*. In conjunction with *"tender costs"* not mentioning the direct costs of design and engineering as often. Mostly tender costs referred to qualitative costs associated with *"strategy"*. This shows that the view of contractors on tender costs tends towards an investment view where qualitative aspects are an important costs and strategy element.

This shift that is noted in the interviews of this thesis, if applicable to the industry means that the attractiveness of the tender is to be viewed differently. In the organisation and design of the tender the client needs to seriously consider the opportunity it wishes to offer to the contractor in respect to the costs. With opportunity being more than the expected value of the won project.

Again, requiring extensive design work, detailed costing or intense dialogue, all of which are expensive elements in a tender, can be beneficial to the project. This conclusion suggests it can also be beneficial in the tender, if sufficient opportunity is provided.

It is suggested in literature that spill over in terms of experience gained and access to other tender through a higher credibility or reputation for the contractor is a legitimate benefit of participation in PPP tenders (De Schepper et al., 2015). This thesis has not focussed on PPP tenders, although one interview with a tender manager for PPP projects was administered. As opportunity was not specifically questioned in the interviews this interview offers no further insight in the matter of inter project spill over. In the final validation interview this is questioned and also confirmed, once again for PPP tenders. For D&C and E&C tenders it is impossible to extrapolate. It does seem logical however that novelties in the tender, if they are a precursor to new tenders would offer additional opportunities in all contract forms. Also, general improvements in communication and organisation allows for contractors to better determine the playing field within the tender potentially increasing their chances of winning and thus increasing the expected value of a won project.

Conclusion 2

The ownership of influences on the opportunity/cost perception lies with the contractor, client and method of procurement.

Validated

The ownership of influences is derived from literature. The initial literature search into methodological influences was unsuccessful, with Hughes et al. (2006) even stating that no methodological influence exists. However literature did provide some insight in client costs, that are influenced by procedure and contracts and client and contractor behaviour are known to influence tender costs through mechanisms explained by transaction costs economics.

In the interviews client, contractor and methodological influences all gathered response. Surprisingly methodological influences were mentioned the least of these three. In validation this question enticed little discussion, but also when specified into :

- Internal situation of the contractor

- Professional behaviour of the client
- Procedural choices in the method

the response was uniformly positive, validating this conclusion.

This conclusion has significant impact. In literature and in general conversation there is a large emphasis on the effects of procurement methodology, contracts and procedures on tender costs. The initial literature study of this thesis also concluded such. However, this conclusion refutes that the influence is this one sided. This means that both parties in the tender, the client and contractor, need to reflect on their roles in the tender. The interviews suggest that assurances for both client and contractor contribute to the perception of high tender cost. These assurances in terms of price, scheduling and other aspects of the project do not necessarily contribute to better opportunity in the tender. It is stated repeatedly in the interviews that there is a mismatch between the tender products asked and the goal of the client. This means that part of the workload in the tender is at least considered to be superfluous. Contractors may, as a result, consider reducing their investment or not participate in the tender at all.

On the contractors side, this result illustrates that participators in this study have willingly supported unnecessary work by continuing their participation. There appears to be no scale of investment that contractors do, even though there could be. Competition in the recent years have enticed a race to the bottom, where qualitative based procurement is per definition expensive because every single aspect needs to be fully elaborated. This conclusion illustrates that contractors may have more room to strategically divide their investment over the different aspects of the tender.

The decision of the contractor to invest is not a yes or no question. It is also a more important question of how much to invest. Internal organisational aspects such as current workload and availability of key personnel play a part as do stimuli from the client. The client can, through the proper use of methodological elements, stimulate investment in the areas it finds most important. At the same time, by emphasizing certain elements, investment in other parts may be reduced. Increased investment if executed properly this can improve the overall opportunity/cost ratio.

Conclusion 3

Assuming two separate decisions based on the possibility/costs perception;

- (further) investment
- entry

the entry decision can be influenced independently from the possibility/costs perception

Validated

Based in the same thick description analysis as the main conclusion the notion of a separate entry decision is supported by 11 codes and 163 quotes in the interviews. This creates the possibility of two streams of influence stemming from the perceived opportunity/cost ratio. The main part of conclusion three is

the notion that the entry decision can be made or unmade based on other aspects than the opportunity/costs ratio. This means that the influence owners, have a wider range of influence than can be concluded from the first two conclusions.

There is also a direct influence, this can be concluded from the quotes mentioned in the client influences on the entry decision. These influences are also far more numerous than other influences (see figure C.2). Communication or information supply by the client can independently influence the decision to enter. As can, contractor influences in terms of availability of execution staff, and other tender possibilities that will arrive.

This conclusion shows a signal that for participants in this study tendering a certain project is a fragile balance. Apparently the operational margin of the costs/opportunity is such that external influences can render it obsolete. Contractors apparently are very conscious of their choices regarding participation and the client needs to be aware of this. Awareness of the fragile balance that each tender has in keeping contractors on board is a necessity. This is exemplified by the reaction some contractors have to tender compensation; it is not considered a financial benefit but an acknowledgement of this delicate balance by the client.

Conclusion 4

Investment and entry decisions are continuously monitored and evaluated throughout the tender process.

Validated

In the interviews one aspect that is mentioned a lot is the decision of contractors to abandon the tender halfway through. This suggests that the decision to enter at the start of the tender is not final. A number of contractor participants also stated in the interviews that there are at least two official moments for them to decide on entering the tender. When questioned on the inner workings of tender decisions responses were that also costs are continuously monitored and that costs exceeding initial budgeting are individually green lighted. From these statements the conclusion is drawn that there is a continuous monitoring of these two main decisions in tendering. This also means that both investment in the tender and participation in the tender can stop at any time, creating a lot of uncertainty for the client.

This conclusion follows the previous three. Many of the implications are shared.

Conclusion 5

The direct influence on the entry decision comes from a single owner.

Not validated

In the analysis of the themes, it seemed that client influences have an influence that goes beyond the opportunity/cost perception. Participants mentioned client behaviour as adversely affecting their decision to enter, regardless of cost or opportunity impact of this behaviour. Also methodology was never regarded as a decisive influence. This prompted the conclusion that the direct influence on the entry decision comes from a single owner, most likely the client. Since

internal influences within the contractor' organisation affect the ability of the contractor to provide the differentiation needed, thus affecting the opportunities side of the opportunity/cost ratio. Since incongruities in client communication, or providing excess or wrong information to the contractor can directly damage the trust relation, these sorts of behaviour directly influences the contractor' decision, without cost or opportunity impact being taken into account. Validation of this conclusion was difficult, since the participants had trouble understanding the conclusion. When asked what directly influenced the entry decision none could choose a single influence. Even though most of the examples provided fell under the opportunity/cost ratio it is difficult to draw the line. This conclusion could not be validated and is retrospectively probably not correct. There are many aspects of influence that are not mentioned in the interviews or validation that could directly influence the entry decision coming from a multitude of influence owners.

Conclusion 6 The entry decision made after being selected is influenced only by direct influences and not by the opportunity/cost perception.
Not validated

Stemming from conclusion 5, this conclusion is an refinement of the single and direct influence on the entry decision. In validation this conclusion was thoroughly rejected and after further consideration this conclusion can be considered to be false. The main influence at the moment after selection is the methodological influence, through the announcement of contract-form and content and award criteria. This defines the risk-division and workload of the tender, influencing exactly the opportunity/cost perception.

Conclusion 7
Contractor influence is very important in the formation of the return on investment perception. With little room for methodological influence.
Not part of validation

This conclusion is supported in both literature and interviews. In literature there is a large focus on client costs as opposed to contractor costs reviewed in this study. But in this literature it is stated that contractor choices in design elaboration and costs definition are important influences.

In the interviews the largest number of codes is associated with the contractor influences. When comparing the different themes the number of codes shared with methodological influences and the entry decision and cost- and opportunity impact is minimal.

As is expressed in the conclusion of the interviews in chapter 6 and in appendix C.3.1 the client and contractor influences is larger since these share far more codes with both costs and opportunity impact. The code "*Deliverable*" and "*Procedure*" are heavily grounded though, therefore the impact of the method can not be dismissed. However it is concluded that contractor influence holds a high value.

This conclusion was not part of the validation as there was only enough time to test the main conclusions, however some aspect can be drawn from

Table 9.1: Shared codes of method influence with impact themes and entry decision

Method impact	
Cost impact	<i>Deliverable</i> <i>Tender compensation</i>
Opportunity impact	<i>Award criteria</i>
Entry decision	<i>Procedure</i>

the validation. In the validation the participants (all contractors) were very concerned with client influences, as they initially were in the interviews. In the interviews however, this attitude changed in the duration of the interview. I think that, the participants have yet to get used to the investment paradigm. The client being the lead party in the process is expressed profoundly in the validation, where the same participants in the interviews put far more value in their own influences in terms of strategy and investment choices.

9.2 Answering the main research question

In section 6.5.2 a proposition is made of the content of the black box depicted in the conceptual and theoretical model (figure 3.3 and figure 4.1). This proposition is made to further clarify the ramifications of the results in the interviews and to provide insight in the possible extend of the answer to the main research question.

Opportunity was not considered a part of the variable set in the conception of this study. It's inclusion does offer some interesting implications in dealing with the problem as stated in section 2.1. Conclusion one illustrates that through strategic decisions by the contractor and proper arrangement of the procurement process high costs can be compensated through opportunity. The following codes, among others illustrate this:

Higher opportunity through Strategy induced costs In figure 7.1 "Strategy induced costs" are shown as part of the contractor influence on opportunity. Contractors make strategic choices in their investment in the tender. Specific parts of the tender can be produced at different levels of costs, scrutiny and level of detail. Deliberately investing more in elements of extreme importance to the client while reducing investment in less important elements increases the cost efficiency of the tender products. This aspect interlinks strongly with the following code contributing to the clients influence on opportunity.

Higher opportunity through Client information supply The contractors are fully dependant on the information given by the client for formulating their designs, ideas and proposals in tendering. During the interviews there were several mentions of poor information supply severely reducing the chances of success for the contractor.

Through providing the correct amount and type of information the contractor is able to determine the key aspects of the project that are of significant

importance to the client. This ensures that the client receives the optimal solution to their problem. In terms of opportunity for the contractor it also enhances the chance of winning of the contractor that best processes the information and addresses the actual problem of the client. This offers more opportunity in the tender since choices of the contractor in terms of organisation, investment in certain tender products and skill sets is rewarded.

The answer Each of the codes shown in figure 7.1 contributes to costs and opportunity. The numbers behind each code correspondent with the groundedness of the code. Groundedness shows the number of times the code surfaces in the data. "Strategy induced costs" and "Client information supply" are mentioned 22 and 25 times respectively and represent two of the most grounded codes.

In the interviews, as they are based on the limited knowledge of solely the narrative literature study, no questions are asked regarding the decision scheme followed by contractors in tendering projects. The filling in of the black box as it is done in figure 7.1, is as far as the data allows. Therefore the proposed content of section 6.5.2 is not represented in the conclusion, as presented in this chapter.

The manner in which aspects influence the perception of the opportunity/cost ratio, as is ultimately questioned by this thesis is a very long answer. This is because each aspect influences either opportunity or cost or both in their own unique way. This study was unable to ascertain every aspect or the unique way that each of these aspects influences the perception of opportunity/cost.

The overall answer to the research question therefore is more abstract and as follows:

Elements influence the the attractiveness of the tender for the contractor to contributing or subtracting to the ratio of opportunity and cost perceived in the tender.

9.3 Recommendations

Based on the conclusions mentioned above there are several recommendations that can be made for both clients and contractors. This research focusses on the elements influencing the perception of high tender costs in uav-gc contracted infrastructural works. The conclusions above indicate that the perception of high tender costs is firstly a perception of the opportunity/cost ratio in the tender, and this is influenced by client contractor and methodological influences. The methodological influences are slight, as it holds little influence over the entry decision, and it is the least mentioned of three influence owners. This brings about the following recommendations

9.3.1 Recommendations for clients

The perception of an unfavourable opportunity/cost ratio stems in a large part from a misuse of the tools of procurement. Procurement is a tool first, and a necessity later, meaning that the implementation needs to be closely related to the use case of the specific tool. The use of MEAT or price based awarding, the

request of detailed design drawings or budgets can serve a certain purpose. But it should be closely monitored if the specific projects requires this purpose as opposed to making do with less.

Secondly when addressing the unfavourable opportunity/cost ratio simply reducing costs requirements of design or deliverables is insufficient. Contractors are able and willing to invest relatively large amounts into a tender, when satisfied with the opportunity given within the tender. This coincides with the previous recommendation since a high investment in the tender is only required when the client actually demands innovation and ingenuity from the market.

9.3.2 Recommendations for contractors

The current market conditions are unfavourable to margins and supply pressures. However tendering has become an investment business over a sales business. The treatment of a tender as a $\frac{1}{\#participants}$ chance still assumes a sale business where equal solutions are presented. The point of investment in the tender is to differentiate, as is recognised throughout the industry. What is not recognised is the large strategic impact you have on your own ability to differentiate. In terms of human resource management, strategic evaluation of tenders, costs/risk management within the tender and risk management post tender among other things, the contractor has a myriad of possibilities to increase the $\frac{1}{\#participants}$ change of success, and full control over the costs of that increase in chance.

9.3.3 Recommendations for future research

From the theory on closed bid auctions expressed in this research, further research can look into the differentiation of opportunity within the context of procurement. As stated briefly in 4.3, the assumption that investment in a tender makes sense as long as marginal costs equal marginal revenue. The statement that opportunity is a large part of the deliberations made suggest that a part of this marginal revenue derives from the process of procurement itself. In this sense it is recommended to perform research as to establish the expected value of the bid based upon the opportunities, and spill over effects within the tender as well as the expected value of the contract won.

(De Schepper et al., 2015) and (Soliño & Gago de Santos, 2010) use multiple regression analysis to provide insight in the correlation between transaction costs and winning the contract and procedures respectively. For future study in within the context of this study it would be interesting to see, to what extent the entry decision is influenced independently from the opportunities/costs perception. As would the division of influence of the eighteen aspects identified within the themes on the opportunities/costs perception and entry decision.

Li et al. (2012) used structural equation modelling to find the factors that effect transaction costs born by the client in construction projects. For this study this was a possibility as well, since it involves a similar question at a different viewpoint. Given the limited time frame and access to data this research as performed as a qualitative study. For a quantitative continuation the use of a survey questioning the aspects found in this study, supplemented with further literature can provide the data necessary to construct a structural equation model that can quantify the impact of these factor on actual tender costs

incurred.

Appendix A

Literature appendix

This appendix describes the process of the literature study. The intention of the literature study performed in chapter 4 is to identify both methodological and cost elements in the procurement process. Secondly the intention is to describe the current state of research on the topic of tender costs. In this appendix on of the main conclusions of the literature study is supported in the first section. In this section the search method, terminology searched for and sources are elaborated upon as to show the full extend of the research done. In the second section the limitations of the research in terms of an elemental approach is elaborated upon.

A.1 Literature search

The main search engine used for finding literature is the acedemic google search engine to be found at www.scholar.google.com. This search engine has the widest range of secondary sources, searching journal databases, libraries, conference proceedings, university depositories etc.

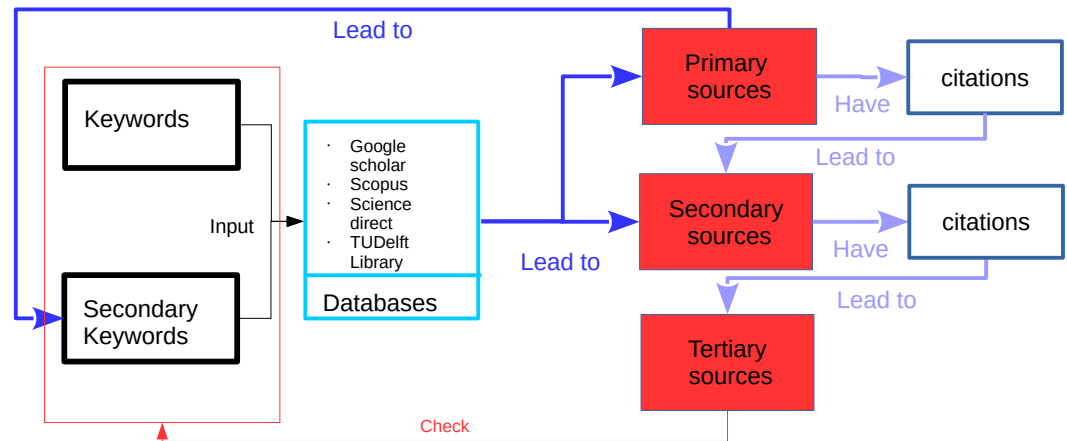
Secondary entries used are the TUDelft library which operates worldwide and searches worldwide university libraries and several conglomerate journal databases such as ABI/Inform.

Once appropriate search terms were established, search engines such as scopus and science direct were used to do more detailed searches in terms of terms, period or authors.

The result of the primary literature search revealed mostly literature between 2000 and 2006. The post 2000 era was the main focus of the literature study because the use of integrated contracts and the issue of increased tender costs was raised in response to the procedural changes initiated in the year 2000. Secondary searches focussed therefore on the period between 2006 and 2015 as to determine whether the lack of literature percieved could be substantiated.

This claim is substantiated by the lack of research from the perspective of the contractor. This is substantiated in tables A.2 A.1. Also, both Hughes et al. (2006) and Dalrymple et al. (2006) state that little research has been done, and a subsequent search defined at the timeperiod between 2006 and 2015 fostered little results, save professional research by (Hardeman, 2013, 2014) and (Strand et al., 2011). Two systemic literature reviews published in 2015 made

Figure A.1: literature study design



no mention of research done on the connection between procurement methods and tender costs or any research from the perspective of the contractor (Naoum & Egbu, 2015) (Ruparathna & Hewage, 2013).

A.1.1 search queries

Search queries in the initial phase consisted of combinations of the following words and phrases:

- tender
- tender costs
- procurement methods
- tender methods
- procurement costs
- integrated contracts
- integrated contracts influence tender costs OR procurement costs
- tender methods

Below a small selection of search queries used is presented:

- tender costs
- costs of tendering
- procurement costs
- costs of procurement
- transaction costs procurement infrastructure

One of the main sources Hughes et al. was found searching for procurement costs and construction in the TU Library database. This query resulted in a number of sources regarding construction management. The book "procurement in the construction industry" by Hughes et al. (2006) was placed in the same section. Subsequent searches on scholar.google.com for this author generated four usable papers and conference proceedings.

Hughes et al. references transaction costs economics, prompting a search for transaction costs in procurement resulting in papers from Williamson and De Schepper et al..

The search for "transaction costs" in combination with tender, procurement, costs resulted in very few usable sources. The sources found where client oriented and focussed on PPP projects (Soliño & Gago de Santos, 2010) and (De Schepper et al., 2015). Other sources referred back to Hughes et al., contributing to the "check" in the literature study design (see figure: A.1)

The initial research did provide a number of additional key words to be used in a secondary search and a number of articles and books for further reference. Primary sources on transaction cost theory, and two systemic literature reviews regarding procurement in the construction sector where found using additional key words and articles cited in sources from the preliminary search. In these studies the processes of procurement and their costs where referred to as:

- Project delivery methods
- pre contract costs
- transaction costs
- tendering burdens (translated from dutch; lasten bij aanbestedingen (Ecorys, Van Zutphen economisch advies, 2015))
- bid costs
- costs of procurement approaches

The different approaches tended to have a similar focus towards project success, meaning the effect of procurement methods on criteria of post contract works performed by the contractor. The manner in which procurement methods where defined differed greatly with most sources focussing on either selection procedures or contract forms.

A.1.2 Tender costs and related topics in literature

Tender costs as described in chapter 4 are touched upon and referenced in literature in a multitude of ways. Theories regarding the make up and influences on different cost structures that could be regarded as related to tender costs are abundant. The specific scope of this research however is not widely researched, as is elaborated upon in 2.3.2

Tender costs are referenced as contracting costs, transaction costs (Hughes et al., 2006), procurement costs, costs of procurement (Hillebrandt & Hughes, 2000), selection costs, costs of purchasing (Costantino et al., 2012), precontract costs (French & McCormick, 1984), costs of procurment route (Harding et al., 2000). Cost theories regarding contracting in general, blind auctions and negotiations are used as tools to further define costs in construction. A lot of research mentioning any of the above is not concerned with the height of these costs or the influential factors upon them but mostly with the impact of the procurement method on project succes criteria, which sometimes incorporate ex ante contract costs.

The main related topics regarding tender costs is the effect of tender methodology on project succes, varying from effects on pre tender construction costs estimation (Elhag, Boussabaine, & Ballal, 2005) to effects on cooperation between parties (Erik Eriksson, 2007). Those sources that most closely approach the scope of this research are by Li et al. (2012), who discusses the transaction costs incurred by the client based upon uncertainty principles in the process and Rajeh et al. (2015) who discusses the same but without utilising transaction costs economics as proposed by Williamson (1979) unlike Li et al. (2012).

Table A.1: Literature Tender costs definitions

Word used	actual meaning	perspective	Source
pre contractual transaction costs	relationship specific investment in obtaining the contract	contractor	De Schepper et al. (2015)
procedural and technical costs of procurement (translated from dutch: kosten van procedures en technieken)	procedural costs of tender procedure (open, closed, negotiation)	client and contractor	(Canton et al., 2012)
tendering costs	costs associated with preparing the tender (clients) responding to tender (contractor) and evaluating the tender (client)	client and contractor	Dalrymple et al. (2006)
costs of procurement	costs incurred in choosing contractors, obtaining an invitation to bid and estimating the bid	client and contractor	Hillebrandt and Hughes (2000)
costs of procurement	costs incurred in marketing, agreein terms, monitoring and dispute resolution in constructicon	client and contractor	Hughes et al. (2006)
costs of tendering	costs of selection process	client	De Boer et al. (2000)
costs of procurment method	the total costs of the building of the asset	client	Harding et al. (2000)
tendering costs	costs associated with the tender procedure (open, closed)	client	(Heijboer & Telgen, 2002)
transaction costs	costs incurred post en pre contract in information gathering procurement and contract administration and enforcement	client	Rajeh et al. (2015)

Tender costs in the Netherlands have been studied by the economical institute for construction. With new procurement legislation being introduced in 2013 partly to reduce tender costs, these needed to be studied. This study used a survey and data about projects between 2009 and 2011.

A prominent conclusion was that proportional tender costs don't rise linearly in conjunction with project value. They drop rapidly from about 10% of project value for small projects to 0.5% for projects valued over €1.000.000,00 (Hardeman, 2014).

The tender costs he differentiates offer an insight in the possible differentiations that can be used in this research. Ultimately Hughes et al. identifies costs of selection and costs in preparing the tender. Hughes et al. also ventures in to ex post costs of procurement in terms of contract management and dispute settlements etcetera, but this is not part of this thesis.

This paragraph attempt to identify applicable costs in the tender. As stated by Hillebrandt and Hughes (2000) normally tender costs are grouped in overhead and not individually marked. Hence, making it difficult to measure or question. Through evaluating some of the cost differentiations made in literature, a main cost structure model for this research is proposed.

The research of Hardeman differentiates three different costs in tendering a construction project:

- Calculative costs
 - costs incurred in determining the price or producing execution plans.
- Other working costs
 - costs incurred by management or other personel not directly related to producing tender documentation. e.g. reviewing documents, attending meetings etc.
- Other costs
 - Other costs incurred mostly in procuring mandated documents, permissions etc.

(Hardeman, 2014)

Dalrymple et al. (2006) bases his cost structuring model on the Australian constructors association. This model is based on activities in different phases of the tender, and is generic so activities of both client and contractor are incorporated.

The aspects of the model that are specific for contractors are limited, while tender aspects that are specific to the client are numerous. In this model only tender meetings and enquiries could be applicable to contractors. The differentiation in tender phases is useful and coincides with the differentiation used by Hughes et al. (2005). He proposes a differentiation in the following phases:

- Marketing
- Agreeing terms

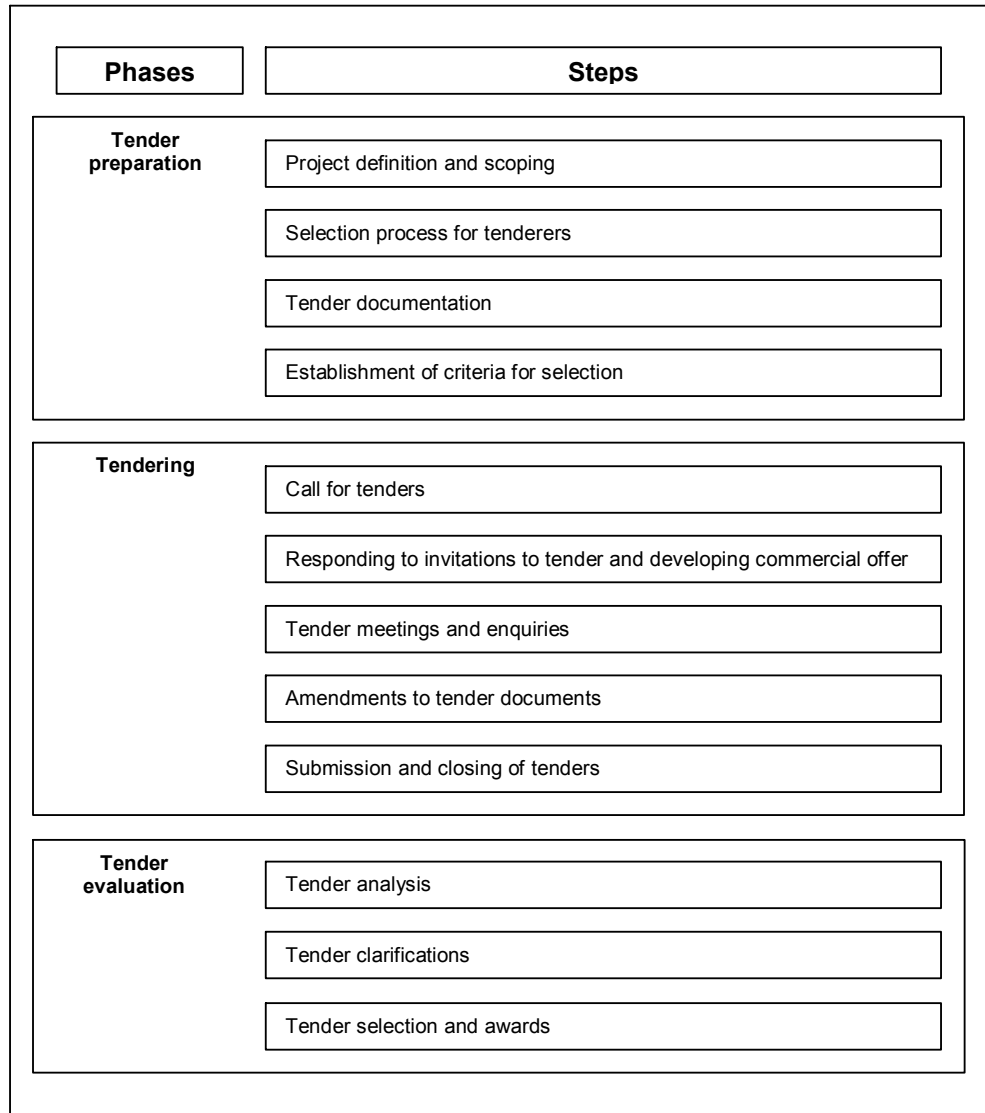


Figure A.2: tender costs model (Dalrymple et al., 2006)

- Monitoring of work

- Resolving dispute

The last two phases in this overview are transaction costs that occur after the contract has been awarded, but the first two overlap with the tender preparation and tendering phase of Dalrymple et al. (2006).

This grouping of tender costs based on phase allows for a some qualitative questioning regarding the costs of each phase. But as both Hughes et al. and Dalrymple et al. acknowledge the amount of data available is small. Therefore it may be more prudent to look at actual activities needed for the production of the ultimate tender. Strand et al. (2011) also utilises a distinction in phases, but within those phases they look at activities executed. Since this study looks at a limited amount of phases, namely the first two in the example of Dalrymple et al., a differentiation in terms of activities may be more manageable. This would allow for more specific data to be gathered with relatively open interviews, since the question is already specified on an activity instead of a phase.

Activities that are executed in the tender are calculations made to determine the price, meetings and other communications executed within the company and with the client and administrative hurdles taken. These costs could be broadly grouped as calculative costs, personnel costs and miscellaneous costs. This grouping gives a very broad overview of tender costs. This research aims to be more precise in terms of cost specification.

A similar grouping is used, in which price calculation and risk division are counted separately from other deliverables. Other personnel costs and miscellaneous costs remain. This results in 5 elements of tender costs being:

- price calculation costs

- risk division

- preparing deliverables

- non calculative personnel costs

- miscellaneous costs.

Table A.2: Literature tender and procurement definitions

Word used	Actual meaning	Perspective	Source
Procurement route	All organisational aspects not related to actual construction	Client	Harding et al. (2000)
Procurement method	Asset and service contractforms + selection method	Contractor	Hillebrandt and Hughes (2000)
Contractor qualification	collection of selection and award criteria	Client	Banaitiene and Banaitis (2006)
Procurement method	Contractform	Contractor	Hughes et al. (2005)
Project delivery system	Contractform	Client	Konchar and Sanvido (1998)
Project delivery system	Contractform	Client	Koppinen and Lahdenperä (2007)
Procurement method	Contractform	Client	Murray, Ive, and Edkins ("unknown post 2011")
Procurement system	Contractform	Client	Rajeh et al. (2015)
Aanbestding	Contractform, selection and award criteria	Client and Contractor	Hardeman (2014)
Procurement practice	Contractforms	Client	Ruparathna and Hewage (2013)
Type of procurement	Distribution of control and risk between client and contractor (contractform)	Client	Gruneberg and Hughes (2004)
Procurement route	Full concept of collaboration agreement (selection, contract, non contractual cooperation agreement, administrative burden, durations)	Contractor	Hughes et al. (2002)
Innovative procurement	Functionally specified integrated contracts	Client	Boes et al. (2002)
Procurement procedure	Manner of division of tasks and responsibilities in construction (contract and contract management form)	Client	Erik Eriksson (2007)
Tendering	Process of preparing responding to and evaluating tender documents	Client	Dalrymple et al. (2006)
Procurement	Selection and award procedure	Client	van de Rijt, Witteveen, Vis, and Santema (2011)
Procurement method	Selection and award procedure	Client	El Wardani et al. (2006)
Procurement procedure	Selection and awarding procedure	Client and Contractor	van Leeuwen (2011)
Supplier selection	Selection phase	Client	De Boer et al. (2000)

Appendix B

Interviews appendix

This appendix provides additional information about the interviews conducted and the analysis of these interviews. The first sections describe the formation of the interviews, and the latter two sections describe the analysis of the interview data.

B.1 Interview forms

Qualitative interviews are often categorised according to the level of structuring in the questions asked. Interviews can be unstructured, semi-structured, or structured (DiCicco-Bloom & Crabtree, 2006). Structured interviews can be considered a quantitative data gathering tool. The specific questions asked, often in a multiple choice format are usually intended to be analysed using statistical means.

Unstructured and semi-structured interviews are intended to allow the participant to freely associate. This creates an opportunity for new data and new aspects of the study to present itself. The downside of a unstructured interview is that different interviews can not be compared. Since there are no common questions or reference point in terms of subject or participant criteria. Therefore it is said that fully unstructured interviews don't exist (DiCicco-Bloom & Crabtree, 2006).

Bernard and Ryan (2009) refers to structured and unstructured interviews as closed and open interviews. Where in chapter 3 the term open interview technique is mentioned, this is comparable to the unstructured format. For this study a semi- structured or standardised open format is used.

B.2 Interview design

This appendix explains the initial interview design in more detail. The interview design is based upon the main influential aspects in the correlation between tender costs and procurement methods, found in the literature. The aspects of Award methodology, tender costs, contract form and deliverables are extended into several possible questions in the question map (see figure B.1).

The question maps serves as a tool to identify where additional information is needed. Most notably those identified in the literature study. Beyond the

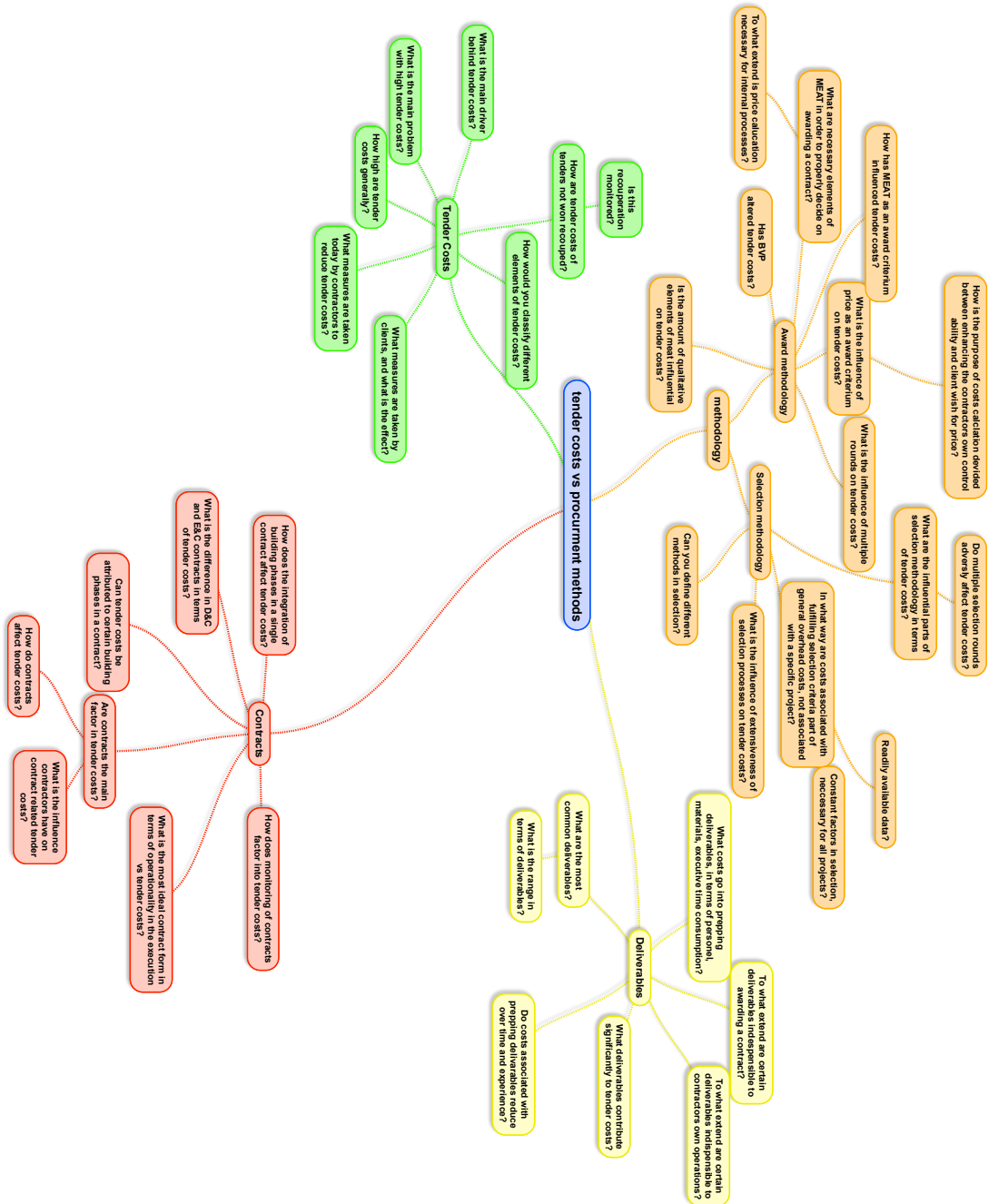
question map, in the following section the choice for conducting semi structured interviews is elaborated upon and the reason for interviewing tender and project managers.

The interviews are conducted using a semi structured format. The question map generates the central themes that provide the common structure among the different interviews as to ensure comparability. The main hubs in the question map form the different subjects, with five in total where methodology is split in selection procedure and award methodology. In order to keep the interviews in a manageable time frame of 90 minutes not all questions stated in the question map are asked. This would also interfere with the open character of the interviews. The subjects mentioned in the question map are converted into three to five questions, with suitable 'probes' to illicit further information (see appendix B.3).

Since the literature study did not unveil a satisfactory elemental structure the open nature of the semi-structured format is exploited to provide additional elements of procurement methods and tender costs. By allowing for extensive answers provided by the respondents and coding these ex post the interviews are able to provide previously new insights into the subjects. This subject expansion beyond the initial design is necessary to provide an answer to the research question.

The semi structured interview format is mostly suited for explorative research (Bernard & Ryan, 2009). The structure this format does provide can be used to provide the data for the formative phase of this research. Comparing the different interviews on aspects mentioned, and codes manifest and latent in the transcripts provides insight in the influences mentioned.

Figure B.1: Question map



B.3 Interview protocol

Interview protocol Open interviews. General questions

Name:

Company:

Function : Management (M), Tender (T), Contracting (C)

Age:

Expertise:

Research question: How can procurement methods of traditional and D&C contracts be optimized as to reduce tendercosts for contractors.

Funnel perspective.

Control questions: Can infrastructural projects between 1 and 5 million be considered medium sized?

Do infrastructural projects between 1 and 5 million incorporate both traditional and D&C contracts.

Tender Costs Why are Tender costs a problem?

Probe: how does this relate to contract form?

Probe: What about compensation?

What are the main drivers behind tender costs?

Probe: What is the mechanism behind this drive?

Probe: What is the influence of the contractor on this driver?

What are universal tender costs that need to be made regardless of other influences?

How are tender costs monitored, reported and controlled?

Probe: how are they reported?

Probe: what about unsuccessful bids?

Contracts Talking about traditional, E&C en D&C contracts

How does the type of contract influence tender costs?

Probe: how is this related to increase in monetary value?

Probe: What costs are specific per contract form?

What is the influence of contractors on the type of contract tendered?

Probe: How does this relate to tender costs?

What is the basis for the choice for a specific contract?

Procedures How is the open procedure viewed?

Probe: how does this differentiate in terms of contract forms?

Probe: How does this effect tender costs?

What are key elements of an open tender procedure that effect tender costs?

How is the closed procedure perceived in terms of impact on tender costs?

How are procedures linked to contract forms?

In the selection phase, how do methods of selection contribute to the tender costs?

Probe: how about multiple rounds?

Selection phase In what way do selection procedures differ?

Probe: Mostly in requirements ?

Probe: What about the usage of personnel?

In what way is data collection needed for selection part of tender costs?

Probe: what about turnover demands?

Probe: what about reference projects?

Probe: What sort of data is produced solely for selection purposes?

How are selection procedures cost inducing?

Probe: What sort of costs are mostly associated with selection?

Awarding phase Can you elaborate on possible techniques used in the awarding phase?

Probe: What about different rounds?

How do these different techniques influence tender costs?

Are there common award criteria that are commonly requested but that are unnecessary for a proper procurement ?

How has BVP altered the amount of work required in the awarding phase?

Deliverables What are common deliverables for a tender in different contracts?

How do different deliverables contribute to tender costs?

Probe: Can this influence be individually marked?

Probe: what about working procedures?

How does costs of deliverables change over time?

What is the distinction between deliverables needed for the client and deliverables needed for the contractor in order to competently complete the tender?

How could you group the costs that go into preparing deliverables?

Unnecessary questions: Can integration of building phases be viewed solely as a differentiation in contracting forms?

Is data on financial solvency, technical risk management etcetera, which is commonly requested in selection criteria readily available at minimal marginal costs? Or are these numbers generated on demand?

B.3.1 Source selection

The respondents were sourced from contacts from senior project managers at Witteveen + Bos. These project managers have managed multiple procurement procedures and have a vast network within the construction industry. Through this network twelve people were contacted by telephone and asked to participate in the interviews of which nine responded that they were available within the time frame. Besides nine people who all hold titles as senior or medior tender or project manager or are director of the acquisition department for 8 different contractors varying in size, three project managers from Witteveen en Bos were also interviewed. The contracting companies varied in size (measured by turnover) between 25 million and 7 billion Euro. All interviews were conducted on the condition of anonymity of both the interviewee and their respective companies.

Because the focus of this research is on the contractor all respondents were asked for their experience in tender costs and the effects different aspects of procurement methods had on these costs. They were asked to elaborate on the tender costs and different elements of the methods and costs that they were referring to in their answers.

The interviews are conducted with tender managers and senior managers in large, medium sized and small infrastructure related contracting businesses. A total of eleven interviews were performed for the main interview section and one interview for validation purposes.

Appendix C

Analysis appendix

For the analysis of qualitative data generated by interviews there are a number of options. These can be roughly divided in textual analysis and interpretive analysis. When analysing the text one can utilise methods such as Key Word In Context (KWIC analysis). With this tool, you analyse words that are frequent in the text and analyse them with the surrounding context. Frequent word use can be an indication that this aspect is of significance. When analysing word frequency, a word map, can be generated that offers a visual representation of often used words. In order to use this tool effectively one first needs to exclude frequently used words that are not of interest to the research question.

In this study no textual analysis is performed since this did not contribute to answering the research question. Also the use of word counts and key word descriptions could create the illusion of quantitative analysis and in this research this is not the case.

This thesis used a analysis approach based on thematic content analysis and grounding theory. Thematic content analysis utilises a coding of the transcribed interview data with an ever greater abstract level as to discover themes within the data (Burnard et al., 2008). With a basis in grounded theory (Glaser, Strauss, & Strutzel, 1968) this method offers some scientific rigour. Grounded theory uses an iterative approach that carefully builds up empirical theory (Hennink et al., 2010).

In the analysis in this study the analytic steps as described by Hennink et al. (2010, p.209) are followed. The base data that is utilised is created by transcribing the interviews 'ad verbatim'. This means that each interview is transcribed fully as to analyse the interviews in the own words of the participants. This reduced the chances of biases being introduced in the data production.

C.1 Coding

The transcribed interviews need to be searched for interesting quotes. This is done by coding. Coding is the practice of labelling issues, topics, ideas, opinions etcetera for future reference in the analysis (Hennink et al., 2010; Saldaña, 2012). It is common practice to develop a codebook based on a portion of the data (Hennink et al., 2010). By developing the codebook based on a part of the data, the rest of the data can serve as a verification tool for the comparability

of the data. If you find a great number of new codes in the interviews coded with the initial codebook, then the interviews are not comparable.

Coding thus allows for identifying and locating interesting portions of the data for analysis but it also is an analysis step in itself. Through coding one gets an idea of the range of topics that is brought up. Especially in semi-structured or unstructured interviews. This identification process is a first step in forming a theory. The coding process also allows for analysing the context of each code. Are similar examples used? Is the tone (that needs to be transcribed as well) similar or different? These questions can also be answered through coding and this provides a broad understanding of the data.

The number of codes used depends on the saturation point. When coding the part of the data set used to create the code book, new codes become increasingly rare, ultimately reaching a point of saturation (Glaser et al., 1968). Hennink et al. (2010) suggest using about a third of the data for the generation of the codebook. With eleven interviews, this study used four interviews for the generation of the codebook. Each interview was coded twice, once for deductive codes and once for inductive codes. The fourth interview offered two new codes, both of which could be considered sub-codes to broader issues that were already coded. Therefore the codebook was considered saturated.

Deductive codes are codes that are derived from literature or theory. These codes have their basis in the interview protocol that was based on the literature study performed for this thesis. Inductive codes are brought forward by the participants in the interviews (Hennink et al., 2010). In table C.7 the codebook as used in coding all the interviewed is presented. Defining codes and sub codes is the first step in the process of defining groups of ever greater abstraction towards formulating a theory.

The description of the codes is expanded through thick description for the most used codes. This thick description offers the first step towards categorisation.

C.2 Categorising

Categorising is the process of finding overarching categories in which to group a collection of codes and sub codes. By providing an extensive description of the most used codes the data is analysed more thoroughly. This creates the in depth understanding of the data that is needed to identify commonalities and patterns (Hennink et al., 2010).

The categories that are discovered need to be validated, since they can occur both inductively as deductively (Hennink et al., 2010). The initial coding process already identifies themes in terms of the ownership of influence, as is elaborated in C.3. These themes are mostly deductive as the influence of the procurement method is recognised in the introduction and part of the research question. The influences of the client are apparent from the literature, and the influences of the contractor can be deduced from transaction cost theory and auction theory. The thick description offers additional confirmation of these themes as is elaborated in C.3.

Table C.1: Thick descriptions

Code	Grounding	Type	Description
Award criteria	2	Deductive theory	Describing the impact of certain award criteria, no award criteria have been explicitly questioned, and it is not brought up by the contractors themselves, testament to the level of groundedness. This is mainly because MEAT issues and pricing issues are discussed but coded with their own respective codes. Regarding award criteria mention is made of a preference for quantitative criteria, and the perception that non-nonsensical award criteria are abundant.
Beeld OG	2	Inductive analytic	Describing the viewpoint of clients as perceived by contractors. Main issue seems to be that clients are not deemed to be very concerned with tender costs as a result of their choices. The groundedness level suggests that this code is somewhat inconsequential
Entry decision	10	inductive analytic	A code that came about during the coding process describing the considerations made on entering a tender. The procedure in itself was not a consideration except for larger contractors that focussed solely on non public procedures. One thing mentioned by consulting engineers was a late withdrawle when the details of contracts where announces. This is mirrored by some contractors who state that the risk deviation is a reason to exit and this deviation should be known upfront
Internal decision model	10	inductive analytic	Describes those aspect in the tender that lie solely with the contractor. In the interviews this mainly came down to a project being close to the company's corebusiness, their internal agenda and order book
Risk deviation	11	deductive theory	Describing the influence of the division of risk between client and contractor, somewhat overlapping contract influences but updated by changes in scope when no different contracts where included. This touches upon the decisions within a contract on risk division altering the tender costs. Main influence seems to be in a entry decision...a perception among contractors is that in large part certain contracting decisions are made mostly on a preferential risk division of the client. This results in a mismatch of contractname and content.

Code	Grounding	Type	Description
Tender duration	11	inductive analytic	Describes the influence of the duration of the tender on tender costs. Most significant in the sense that mostly changes in the tender duration are viewed negatively. A long tender duration contributes mainly in costs in keeping the tender team together, more so in the case of changes. There is a minimum time required, besides lawfully so ...but it seems that short tender durations are preferred.
Main influence	13	deductive question	A defining question in the interview protocol, with answers differing greatly. Describes the perception of the contractors in the main influence on the tender costs. Answers differ greatly, and touch upon the similarities between the tender and the company profile, the methodology used, where two participants put it upon client and contractor behaviour respectively. No consensus on the main influence in tender costs is discernible. Out of 13 codes 8 different influences are mentioned
Tender compensation	13	deductive question	describes the influence of tender compensation which turns out to be mostly symbolic since the compensations offered are too small to be significant. It is expressed as a welcome acknowledgement of the fact that costs are made. Some contractors do include compensation in small strategic decisions, but overall it is deemed inconsequential for entry or investment decisions..if compensations were larger this would change
Environmental lock in	14	inductive analytic	Describing the manner in which environmental factors such as architecture, location, legal procedures, environmental management dictate client decisions. Contractors mainly notice restrictions on the design freedom, either in architectural considerations made in actor conjunction or in route decisions. On the other hand mainly considerations concerning nuisances for surrounding actors, solutions are sometimes already negotiated by the client, and are henceforth not free. Main concern here is not the limited freedom but the way in which this limited freedom is contracted, linked with goal-method discrepancy

Code	Grounding	Type	Description
Experience	14	inductive question	the influence of experience on tender costs. This is limited based on participants. Efficiency increases in drafting MEAT plans is noted with experience, but the judgement of these plans is not uniform. Hence a plan with client A may be judged completely different from the same plan with client B, one contractor disagreed and states that a matrix of previous projects is very useful. Some contractors note that they have a fair judgement of their own performance, but this is not felt uniformly across participants. Notable is one remark that the experience of contractors nullifies MEAT criteria, since experience makes all contractors perform on the same level, making a distinction on MEAT criteria more difficult.
Communication	15	inductive analytic	Describing the benefits or downsides of communication. Downsides were perceived in inconsistencies in queries from clients. Consulting engineers mentioned seeing contractors having trouble understanding decisions of the client, stating more communication here would help. Main aspect of communication that was brought forward by contractors is the importance of dialogues in the tender process. Both benefits to chance as cost savings are mentioned. If this is not possible this is deemed very negative
Nature of tender costs problem	18	inductive question	Describing what the problematic aspects of high tender costs are, sprouting from the deductive notion that tender costs are problematic, which is questioned, this code is slightly altered since responses considered tender costs less problematic than anticipated. The issue was mostly with reduced margins on work due to the crisis and a conglomeration of works in larger contracts reducing the number of contracts on the market, with larger contracts increasing absolute tender costs. The problematic nature was also nuanced by participants stating that it simply required a change in operation. Comparisons with other markets were drawn to support the notion that the balance between tender costs and profit margins is unhealthy

Code	Grounding	Type	Description
Contract influence	20	deductive question	Meant to record the influence of the contract, the code is less useful as no contract differentiations remain within the scope. However a strong response from respondents is the wide variety within equally named contract forms, mainly D&C. This prompt some contractors to develop their own system linking contracts to expected tender costs, in regardless of the naming of the contract as D&C or E&C. Differentiators that are mentioned are the freedom in design, focus upon pricing and MEAT products that are asked. This seems to be independent of the label put on the contract. The label is seen as a representation of the desired risk profile by the client.
Chance	21	Deductive theory	Describing the influence on tender costs and decisions made regarding the number of competitors in a tender. This is dependant on the procedure chosen, but also on the business model of the contractor. This was brought up by consultant engineers as a process. Contractors stated that both the identity of competitors and the number was a determined in the decision to participate. Influences on tender costs where not mentioned. One participant mentioned a dislike of lottery's to reduce tenderers in a non public procedure. From the responses another element of chance is discovered. Contractors perceive the MEAT characteristics of a tender as being favourable or not, this means that this code is also describing the way that the perception of a favourable MEAT question influences tender costs made. Two influences where noticeable in the responses, mainly a decision to participate and the willingness to invest. An unfavourable MEAT can prompt an exit, however the decision to invest is described as a 'gut-feeling' as to the ability to be distinctive in the proposal. (connected to real MEAT value, and investment justification)

Code	Grounding	Type	Description
Real MEAT value	23	inductive analytic	Describing the influence of the qualitative part of the awarding taking into account it's share and the manner of judgement. Evolved from questions on the influence of MEAT. This code has a lot of involvement with other codes mainly entry and investment justification. Also goal method discrepancy since MEAT is perceived to be used in wrong ways...resulting in either non distinction or a net awardance on price. Combine this with the the deliverables code stating that the costs of creating qualitative documents are independent of project size...offers an insight in the investment considerations . Especially consulting engineers found this to be crucial stating the differentiation ability of the MEAT is key. Contractors view a strong real MEAT value as an incentive for higher investment in the tender, and as critical for an optimal result for both client and contractor. Even though it is stated that price is still leading in most cases
investment justification	24	inductive analytic	Describing a willingness to invest, distinct from entry decision as it revolves around the viewpoint of tendering as an investment. The groundedness shows that this is a viewpoint that is present. Consultant engineers have a specific viewpoint that this participating in a tender is more and more an investment decision...Contractors don't use that word as much. They do however describe a balance that needs to be struck. One participants describes an entry into negotiated contracts to be a reason to invest.
consequence high costs	25	inductive analytic	The consequence of high costs was not questioned initially but kept coming up. From the introduction the expectation was that high costs reduced the number of contractors participating in a given tender. The response however where more detailed. Mainly the influence was felt in decisions made and in the evolving of contractor organisations.This code thus describes how high codes are dealt with and what strategy contractors use to deal with this phenomenon. This shows a sort of acceptance of high costs, that needs to be processed in better organisations and has an effect on management decisions

Code	Grounding	Type	Description
Non calculative costs	27	Deductive theory	Describing the amount of effort or costs associated with non calculative tasks like the plan of approach, meetings, dialogues etc. Main component being the fabrication of the plan of approach, considered a substantial costs by most participants. This is met with a bit of contempt at times, especially in combination with real MEAT value expressing a the feeling that this effort is in-effective. Main characteristic of quotes is that costs are considered higher.. in three occasions non calculative costs are included stating that non calculative have considerable influence compared to purely calculating price. The main vibe is positive, sometimes stating outright that the inclusion of non-calculative elements is positive. Main issue is with the balance between amount of work and effectiveness, this is not explicitly stated
Goal-Method discrepancy	28	deductive question	One of the main interests of the interviews was the difference between perceptions of the contractor and the client with regards to procurement methods. Mostly describes contractor views on a wrongful use of elements of procurement methods resulting in unnecessary or unnesseccarily large tender costs. this varies from requesting further proof beyond certifications, to redoing designs to elaborate demands for participation. A main concern is the perception that clients often don't appreciate the financial or time demands of certain methods. The code mostly describes manner in which contractors feel certain work is superfluous or unnecessary in the tender Deliverable 36 deductive question Describing the influence of the documents or other deliverables that need to be handed in as the physical part of the tender. This is one of the most occurring codes, with a lot of co-occurrence with costs describing codes. Differentiation is made between the aesthetics of the deliverables, prompting the need for writers, graphic designers etcetera and the detail of design and costs aspects. A detailed budget or comprehensive and detailed design drawings are considered very expensive. There is doubt on the usefulness of certain requests for deliverables, this links to goal method discrepancies. remarkable is that the costs of deliverables is deemed independent of project size, or division in price/quality.

Code	Grounding	Type	Description
Procedure	47	deductive question	Describing the influence of the procedure on tender costs, this was deemed highly influential and subject of half the themes in the interviews. Procedure was mentioned a lot, in various forms, but most common response was the non-influence of procedure on tender costs. Procedures were sometimes deemed ineffective but mostly an administrative affair. Notable where some distinctions that showcased a missed opportunity for forcing an entry decision. This would reduce the cases where after, selection contractors bow out because of new information, that sometimes could have been shared in the selection procedure. Selection is deemed important and reducing the number of participants in a tender through selection is uniformly seen as a positive. If procedures are deemed to increase costs, this is mostly locked in the procedure with increased dialogue or through BVP procedures
procurement organisation	49	inductive analytic	Describes the influence of organisational aspects of procurement on tender costs. This falls outside the expected costs of methodology or procedure or contracts. This aspect was found inductively even though it was expected, as little support from literature was found. Main differentiators are found in planning, stability of the tender-request and the information supply. Over all most influences of organisation are based on changes during the tender process, be it in planning or the questioning. However most quotes regard the information supply, being to large, or of bad quality. This also hints back to the procedure where entry decisions are made AFTER selection because of new information. This was mostly mentioned by consulting engineers who consult clients on the matter.

Code	Grounding	Type	Description
Strategy	57	inductive analytic	Describing how strategic behaviour of the contractor influences the tender costs made. Strategic behaviour of the contractor proved to be more significant than expected, it not being a part of the interview protocol. An overarching conclusion can be that contractors willingly and knowingly deviate from the calculations and deliverables that are asked by the client. This indicates a willingness to invest more than the minimum requested. The decision to invest extra is in part motivated by a desire of security in the bid, meaning that the risk division is such that it fosters anxiety over construction risks embedded in the plans. Otherwise there is the recognition of opportunity that prompt additional investment. investment can be made on decreasing the margin of error in the price proposed or increasing the perceived MEAT chance. Another major component was the manner in which the contractor felt that the price offered matched the risk division inherent in the contract. Main concern was contract management during construction aiming for an optimal working relations, acknowledging that a bad ratio could foster requested changes in the contract or payments
tender costs	89	deductive question	Describes the different costs groups associated with tender costs and if, and the manner in which these are problematic. Design and engineering costs, initially deemed to be dominant where not mentioned often with most quotes going to price calculation and non calculative costs such as qualitative documents. Price calculation is separated from the design supporting the price. This seems to be because the level of design is not entirely dependant on the price calculation effort. Some contractors differentiate between a tender design (defined as the minimum required for calculation) and preliminary or final designs requested by the client, resulting in extra design costs as opposed to calculation costs. Increased freedom does have an effect on the costs associated with the tender design, that could be also allocated to price calculation. in terms of leading costs, non calculative costs are mentioned most often as a leading part in tender costs together with designing both the tender design and further designs if requested. Notable is that a ceiling price is considered by some as helpful in reducing tender costs as it allows them to reduce the design effort needed for price calculation.

C.3 Conceptualising

Six themes are identified within two concepts. In this section the coming to fruition of these themes and concepts is elaborated upon.

The first concept of influence ownership originated from the coding process and consists of three themes:

- Method influence
- Client influence
- Contractor influence

During coding common threads between codes are discovered that showed how the ownership of influence was perceived by contractors. The concept of influence ownership reflects on the input parameters of the analytical model.

Method influence Method influence describes the proposed influence of governance on tender costs. This influence is the underlying assumption that prompted this research. Expecting an influence from choices in contract, procedure and award criteria. These choices have direct ramifications upon the workload and documents that are required to participate in the tender. This theme follows mostly deductive codes that follow logically from the interview protocol

Table C.2: Theme: method influence

Theme	Method influence
Common attribute	The influence of aspects of the procurement method as defined in this thesis. These aspects represent one time choices of procurement governance by the client.
Group of codes	Tender compensation Contract influence Procedure Award criteria Deliverable

Contractor influence Contractor influence consist of many inductive codes. The initial expectation upon which the interview protocol and codebook were constructed assumed a more passive influence of contractor. "**strategy**" is a code that particularly proves this assumption wrong. Being a code that is highly grounded, it tells of strategic behaviour by the contractor and very concious decisions that are made regarding tender costs invested and risks taken both in the tender as in the post tender phase. The code "**Internal decision model**" sheds light on the influence of business identity in procurement. This code describes the part of the decisions that are instigated by a fit between the procured work and the identity of the contractor in terms of core business or strengths and weaknesses.

Table C.3: Theme: contractor influence

Theme	Contractor influence
Common attribute	Influences or decisions that lie within contractor control and are directly or indirectly linked to tender costs
Group of codes	Chance Experience Consequence high costs Strategy Investment justification Internal decision model

Entry decision Entry decision as a theme differs from the code "entry decision" in that it offers a broader viewpoint upon the matter. The code strictly describes mentions of the decision where as the theme goes into the more complex collection of reasons and considerations. "strategy" and "goal-method discrepancy" show the range of codes contributing to this theme. Coming from both contractor and client influential ranges and addressing both issues of contractual freedom and internal possibility of the contractor.

Table C.4: Theme: entry decision

Theme	Entry decision
Common attribute	The different influences on a contractors decision to enter a tender or leave a tender procedure at any given time during or before the procedure and before the tender is awarded
Group of codes	Chance Communication Entry decision Internal decision model Procedure Procurement organisation Risk division

Opportunity impact The opportunity impact is an essential theme in the overall theory. It describes the main reason for the existence of construction companies and their willingness to tender. The opportunity! Construction companies, as any company, exist to serve a purpose and serve it such that, through profits, they can grow and thrive. This means recognising opportunities to expand their respective benchmarks. This is expressed by the codes encompassed in this theme. Many of the codes :

- Real MEAT value
- Goal method discrepancy

- **Environmental lock in**

Focus on the manner in which contractors can differentiate among themselves based on the qualitative aspects of the procurement question. This supports the notion that a search for opportunity is underlying in these codes, as differentiation ensures opportunity for those that best adapt. This is underscored by the presence of codes like : "**Strategy**" and "**Internal decision model**", that go into the contractors sphere of influence.

Table C.5: Theme: Opportunity impact

Theme	Opportunity impact
Common attribute	Describes the opportunity that contractors see in participating and winning the tender for revenue, profit, strategic purposes or otherwise
Group of codes	Award criteria Chance Communication Environmental lock in Goal Method discrepancy Internal decision model Procurement organisation: client information supply Real MEAT value

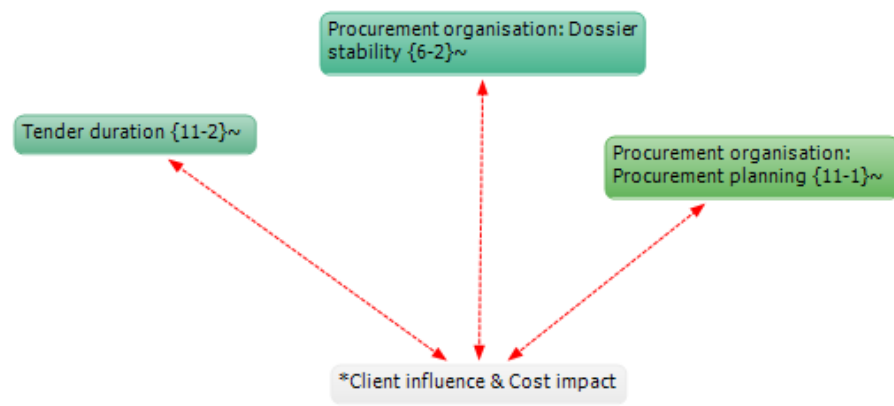
Cost impact Cost impact describes the aspects that influence and that are influenced by costs. Unlike the elements of cost theme, that is more of a control and describes different elements of costs that comprise tender costs. The costs impact mainly visible in codes such as "**Deliverable**" from which quotes state repeatedly the high impact deliverables have on costs.

Quote: *En daar komt bij dat ook de kwaliteit van de documenten die tegenwoordig ingediend worden, dat moet steeds....aan een steeds hoger kwaliteitsniveau voldoen. Nou op zich is dat prima, maar dat betekent ook dat het opstellen van die plannen gewoon onwijs veel geld kost*
ConInterview02

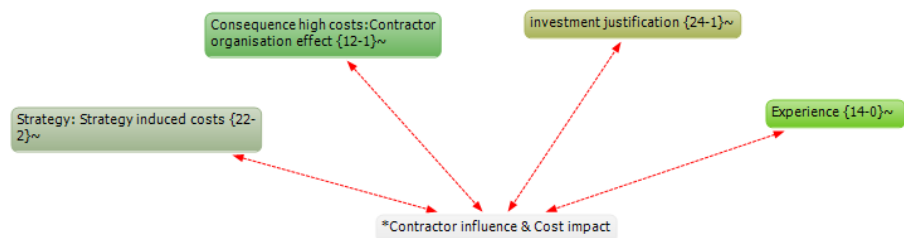
Other codes also describe an influence on costs and are either within client or contractor control or a costs influence upon procurement and the tender procedure like "**Consequence high costs**". This describes several organisational and managerial impacts that high tender costs have had on contractors..

C.3.1 Theme comparison

As is presented in section 6, a main analysis technique used is the comparison of themes, to see which codes they share. This creates an insight on what aspects these themes interact. There are several interesting interactions that support some of the conclusions drawn in this thesis. These interactions are presented here.



(a) Client influence And cost impact



(b) Contractor influence And cost impact

Figure C.1: Shared codes with themes cost impact

Table C.6: Theme: Cost impact

Theme	cost impact
Common attribute	Describes the influence sphere of tender costs in themselves and those aspects that directly affect these tender costs. Codes are specific for causing direct cost
Group of codes	Consequence high costs Deliverable Experience Investment justification Procurement organisation Strategy: strategy induces costs Tender compensation Tender duration

A interesting aspect regarding the shared codes in costs impacts with client and contractor influence respectively is that the codes all regard internal mechanisms. The impact of clients are organisational aspects as are the influences of the contractor. This could be because costs impact regards the influences on costs rather than the costs itself, as is shown in table C.6.

Client and contractor influences coincide on a roughly equal manner with the cost impact. This does not mean that they actually influence equally, this cannot be determined from the data. However looking at the groundedness of the codes (depicted as the first of the two numerals in the coloured segments) the communal codes of contractor influence and costs impact are grounded more in the data. This means that these codes are used more often throughout the data set, which implies that the contractor influences are mentioned more, and are thus more prominent in their influences.

A remarkable observation is that the combined codes of the themes "entry decision" and the contractor and client influence are very distinct in the number of shared codes. Client influences and the entry decision share six codes to the contractor influences' three (see figure C.2). This shows firstly that a wider variety of topics were mentioned in relation to both themes. This is exemplified by the contrast in quotations, with 75 quotes on the client influence and 31 on contractor influence in relation to the entry decision. but also from the texts that client influence was deemed very significant in the entry decision.

The contractor influence lies in the way in which the contractor sees their company as a "good fit" for the tender. The relation to the companies core business and current status. This current status includes the order file, organisational maturity etcetera. This is mentioned in seven interviews, as is the way in which the contractor perceives their chances in the MEAT criteria. These subjects fall under the influence of the contractor because they make organisational and managerial decisions regarding their qualitative capabilities and internal capabilities. This is expressed in the internal decision model code associated with both the entry decision and the contractor influence (see figure C.2b)

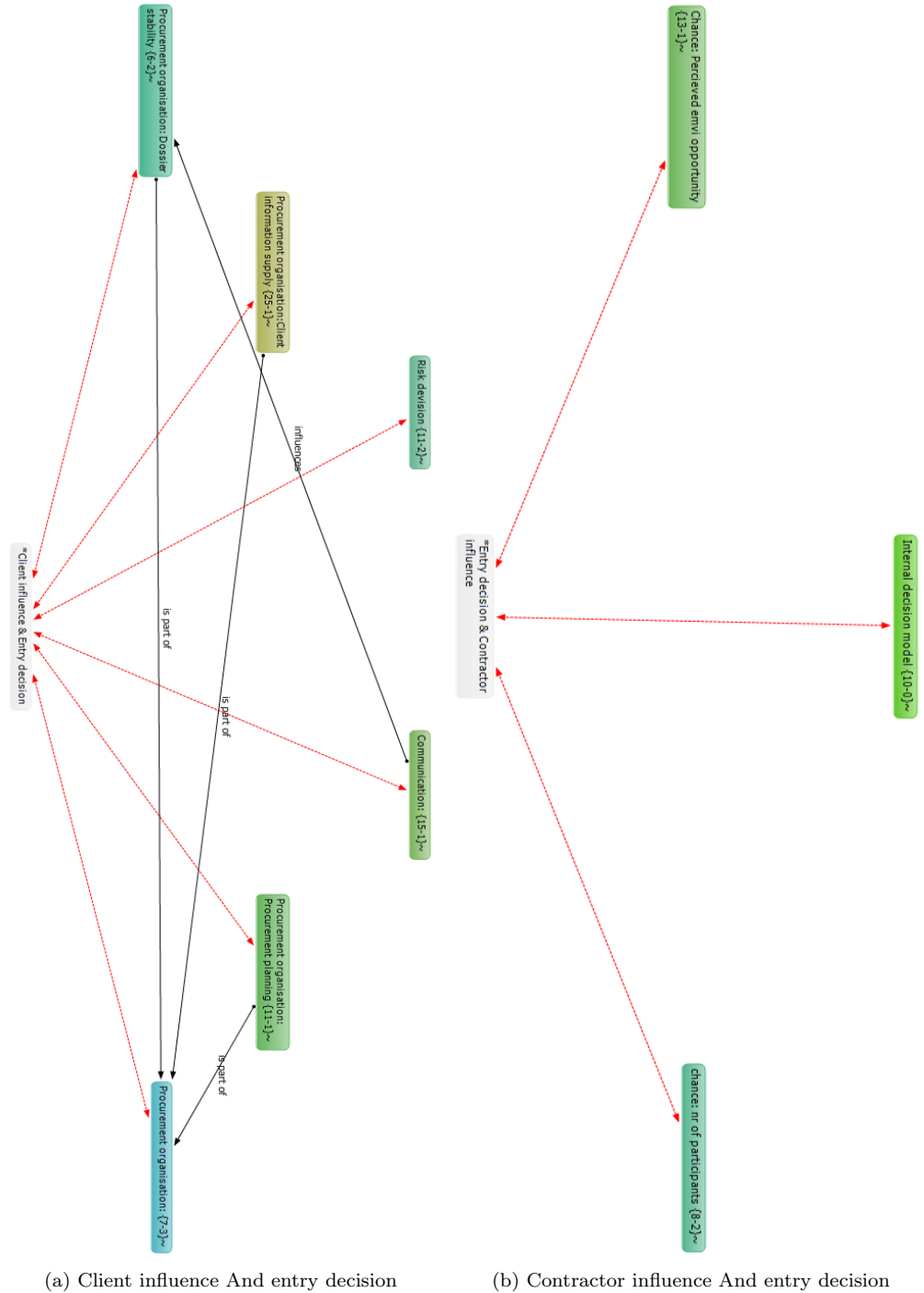


Figure C.2: Shared codes within themes entry decision

Quote:

Je kijkt ook gewoon naar je orderportefeuille, je capaciteit van mensen door te zeggen van we gaan er wel voor of we gaan er niet voor.

Coninterview03

The client influences are expressed more often, and is very focussed on procurement organisation and communication (see figure C.2a). These aspects are vital in the entry decision mostly during the tender. Procurement organisation and communication works throughout the tender process. This shows that the entry decision is not made one time, but is a continues test during the tender process. A different aspect that manifests itself earlier is the risk division. This code is used eleven times and paints a picture of a comprehensive consideration regarding the contractual risks and the behaviour of the client regarding this risks.

Quote:

Kijk je kunt wel denken, ik gooi alles op een bult en ik doe alle risico's erin en ik gooi het naar de markt. Maar ook die markt maakt afwegingen en die zegt van nou, dat gaan we op een gegeven moment gewoon niet meer doen.

ConInterview02

C.4 Codebook

Table C.7: Codebook

Code	Subcode	Type	Description	Example
Tender costs	Non calculative costs	deductive theory	Describing something affecting tender cost through personnel and time consumption in non calculative or engineering tasks	
	External costs	inductive analytic	Costs incurred by the need to hire external personnel/or expertise	ConInterview03: "Maar goed dat betekend wel dat we weer een paar architecten moeten inhuren, en dan moet je ook wel weer architecten van naam hebben." blz 18
	Engineering costs	inductive analytic	Describing those aspects that effect or are part of the main engineering task within the tender thush influencing that part of the tender costs	ConInterview02: "Het is een deel ontwerp, gewoon technisch ontwerp." blz 7

Code	Subcode	Type	Description	Example
	price calculation	deductive theory	Describing something effecting tender costs through altering the costs of calculating the price offered for the tender.	EngInterview01: "maar natuurlijk met name voor die aannemer die doet een prijs en die wordt eraan gehouden".. Blz 13
	Tender costs in general	deductive question	Describes the general attitude towards tender costs	ConInterview03: "Nou ja, problematisch, het zijn gewoon hoge kosten.." blz 1
Tender compensation		deductive question	Responses describing the influence of tender compensation on decisions or tender costs	ConInterview03: "Die vergoedingen staan niet altijd in de leidraad dus die weet je niet" blz 7
Contract influence		deductive question	A response regarding the influence of the contract form on tender costs	ConInterview08: "Je zal met een RAW sneller een prijsvechter krijgen dan op een D&C" blz 27
Procedure		deductive question	A response regarding the influence of the procurement procedure (public, non public, bvp etc) on tender costs	ConInterview03: "ja, die pre-kwalificatie die kost wel wat, maar daar zit niet het geld". Blz 15
award criteria		inductive question	Refers to the importance of award criteria and what they measure..the importance of certain criteria and their value compared to the tender costs they induce	EngInterview01: "geeft die aannemer he laat die zien dat hij snapt waar het om gaat, waard e essentie van het werk zit, de spannende dingen eehm en heeft di edaar concrete oplossingen voor" blz 15
Deliverable		deductive question	A response regarding the influence of the production of tender deliverables on tender costs	ConInterview03: "we hadden er laatste een-tje, daar moesten wij aantonen dat we een opleverdossier hadden gemaakt.." blz 15

Code	Subcode	Type	Description	Example
Risk de- vision		deductive theory	Describing something effecting tender costs through changing or acting upon the deviation of risks between contractor and client	
Tender duration		deductive theory	Influences on tender costs instigated by the duration off the overall procurement procedure or changes therein	
Goal- Method discrep- ancy		deductive question	The manner in which a mismatch or redundancy between the goal of the client with the procurement method and the manner in wich the procurement method is executed effects tender costs or succesfull deliverence of the intended results	ConInterview02: "Maar er worden ook dingen gevraagd, dat je denkt ja is dat nou zo belangrijk hier.. Blz 3
Procurement organisa- tion	Client in- formation supply	inductive analytic	The influence of the information supply by the client on tender costs	EngInterview01: " maar wat dan in het plan van aanpak moet staan, en hoe dat precies dan berekend wordt is vaak nog niet eens duidelijk in die fase." blz 9
	dossier stabiliteit	in vivo	The influence of changes to the method/procedure or content of the question.	EngInterview02: "Dat eisenpakket vanuit de klant moet stabiel zijn" blz 27
	Procurement planning	inductive analytic	The influence of planning and scheduling by the client on tender costs	

Code	Subcode	Type	Description	Example
Communication		inductive analytic	Segment describing the influence of proper of lack of proper communication from the client to the contractor on decisions regarding the tender or tendercosts as such	EngInterview01: "Dus dat is altijd wel goed om te duiden van joh, ook richting de aanemers waarom je bepaalde documenten vraagt. Wat de achterliggende risicoperceptie bij de opdrachtgever is." blz 10
Real MEAT value		inductive analytic	The net influence the MEAT has on awardance taking into account it's share and the manner in which the different aspects of award criteria are judged.	EngInterview02: "Het is nooit zo dat de ene partij een nul haalt en de andere partij een tien. Nou ga er dan eens vanuit dat de ene partij een zes haalt en dat wij een acht halen-wat is dan het prijsverschil en wat maak je daarmee goed" blz 21
Environmental lock in		inductive analytic	Describing the effect of not being able to alter or diversivy options withinD D&C contracts because of previously agreed upon environmental aspects in archigecture location etc by legal procedures or environment management by the client	ConInterview03: " in de gemeentes die zijn allemaal in de omgeving, hebben ze eindelijk gediscusseerd over vormgeving, kleurtjes, model weet ik veel" blz 9
Chance	perceived MEAT opportunity	inductive analytic	Influences of the perceived ability of the contractor to exploit the MEAT criteria to it's benefits thus increasing the chance of wining the tender	

Code	Subcode	Type	Description	Example
Experience	nr of participants	deductive theory	Influences on tender costs, or decisions made with regard to tender costs instigated by the number of people participating in the tender	EngInterview01: "Nou ja, in diez in, wat wel een verschil is. Bij de openbare procedure heeft de aanemer natuurlijk zelf ook geen idee van hoeveel concurrenten gaan er meedoen" blz 20
		inductive question	The influence of experience on tender costs or the procurement process from the point of view of the contractor	Coninterview02: "En dan moet ik eerlijk zeggen we hebben daar inmiddels nu wel zo veel ervaring mee. Datwe over het algemeen wel kunnne inschatten, of we het goed gedaan hebben of niet" blz 6
Procedure locked in costs		inductive question	The amount, or aspects of procurement method or tender costs that are inherent to the overall procurement experience thus not influenced by methodology	ConInterview02: "Een deel zit gewoon opgesloten in de procedure. Heheb je meerdere overleggronden, hoe lang duurt de tender" blz 7
consequence high costs	Contractor organisation effects	inductive analytic	The effect of procurement methodology on the organisation and governance of the contractors bussines and vice versa	EngInterview02: "Wil je een productie aannemer zijnof wil je ene jaik zou willen zeggen bijna een bouwmanagement bureau zijn die ook nog bouwt"
	Contractor management effect	inductive analytic	segment describing the actions or thought processes of contractors faced with high tender costs. Actions and thoughts need to be directly and causally related to higher tender costs	EngInterview01: P Endaar zie je de afgelopen jaren, dat is niet dit jaar, maar dat is al een paar jaar dat de aanenmers dus voor zichzelf, als ze een uitvraag zien, dat natrukkelijker d evraag stellen: Ja ik moet er meer in investeren, eehm dus aannemers worden selectiever. blz 3

Code	Subcode	Type	Description	Example
strategy	price-risk balance	in vivo	The manner in which the overall deal struck at awardance is in accordance with the mutual best interest of bussines continueisation and project quality. Meaning the incorporation of construction risks in the price tendered	EngInterview02: "Dus ik denk dat de klant een betere oplossing krijgt, en ik denk dat wij over het algemeen een betere prijs hebben. Waarmee ik niet wil zeggen dat die prijs veel hoger is, maar hij is wel beter in balans met wat je meot doen, met je risciprofiel" blz 18
	strategy induces risk	inductive analytic	Describing the influence on tender costs of the risks taken on by the contractor by tendering in a certain way or to a certain extend in pricing, material amounts etc.	ConInterview03: "En vaak is het zo hoe meer geld je besteed aan een tender hoe meer risico's je kan vermijden maar dan gaan die tenderkosten weer gigantisch omhoog" blz 3
	strategy induced costs	inductive analytic	Describing the effect of contractors intentionally increasing tender costs for strategic reasons	EngInterview01: "Ja, dat is een afweging die de aanemer op een gegeven moment maakt van ja, hoe mooi, om over die 3d plaatjes, visualisaties, hoe mooi ga ik het maken, hoeveel kosten ga ik daar zelf dus insteken" blz.17
investment justifica- tion		inductive analytic	Segment describing the willingness to invest in the tender and to view it as an investment vs viewing it as costs	EngInterview01: "ik bedoel ja, concurreren en offertes beteend nou eenmaal dat je moet investeren dus daar mag je best wel een investering van de markt vragen vind ik." blz 5

Code	Subcode	Type	Description	Example
Internal decision model		inductive analytic	Describes those aspects relevant to the tender and tender costs that are based solely on the internal qualifications and governance of the contractor	ConInterview08: 'Heb je de competenties, kun je het werk aan, eeh..heb je de goede partners.' blz 6
Main influence		inductive question	segment describing the answer to the question what the main influence on tender costs is	EngInterview01: ".Aannemers zullen sowieso kijken naar hoe ziet dat contract er ook uit, eeh hoe ziet de verdeling van de verantwoordelijkheden." blz 7
Nature of tender costs problem		inductive question	Describing why high tender costs are an issue, if they are an issue and what aspects are problematic in relation to other aspects or context	ConInterview03: "Als je kijkt naar de opslagpercentages die gebruikelijk zijn dan is dat best veel" blz 1
Cost Devision		inductive question	Designates a certain deviation in total tender costs over aspects of the procedure or tender costs	ConInterview08: "Nogmaals een tender ontwerp voor nodig zijn. Dat zal toch misschien wel 50% van de tenderkosten isen het maken van ene plan zal, als ik dan toch percentages moet noemen, 20 procent" blz 31
Cost Percentage		inductive analytic	Mention of the relative tender costs in percentages. This is convenient for future reference and validation purposes	EngInterview01: "Bij een uav-gc contract kost het hem misschien wel 2% , 2,5%" blz 4

Appendix D

Validation appendix

In this appendix the basic requirements for validating qualitative studies are elaborated followed by a more extensive account of how the results of this thesis where validated. Validation in qualitative studies is a discussion point throughout the scientific community, as qualitative studies are mostly interpretive and highly dependant on context and specific circumstances and respondents.

D.1 Theory of validation in qualitative studies

Validation in qualitative studies has long been disputed (Baxter & Eyles, 1997; Morse et al., 2002; Burnard et al., 2008). Because qualitative research depends on the interpretive skills of the researcher making standardisation of the analysis difficult. Comparison and validation requires a certain degree of standardisation (Baxter & Eyles, 1997).

As it is established that validation is possible with qualitative studies (Baxter & Eyles, 1997), the strategies for developing 'rigour' as Baxter and Eyles (1997) calls it are numerous. They vary from providing a rationale for certain choices made such as:

- Number of respondents
- Qualification of respondents
- Use of quotations
- Exposition of procedures
- Verification of respondents
- Etcetera

The use of multiple of these steps is recommended but does not guarantee sufficient validation (Baxter & Eyles, 1997). Baxter and Eyles (1997) identify three aspects that need to be addressed in order to establish rigour in qualitative studies:

- Credibility
- Transferability

- Confirmability
- Dependability

These aspects are analogous to verification and external and internal validation as used in quantitative studies. Morse et al. (2002) argues for the following terms to ensure rigour:

- Reliability
- Validity

The term validity is used to ensure that it's merits are shared throughout the scientific community but the meaning of the two terms is similar to credibility and dependability as used by Baxter and Eyles (1997). Confirmability is specific to qualitative research as it deals with the degree to which the results are based on the data as opposed to biases or perspectives of the interviewer (Baxter & Eyles, 1997).

Credibility deals with the recognisability of the results in the general population. This is different from transferability which deals with the application of results, and the manner in which the respondent set is applicable to a larger population. Credibility deals with the manner in which the results and concepts generated from the data are recognised by those involved in the context of the study, mostly the respondents themselves. This ensures that the views and thoughts expressed by the participants is adequately portrayed by the concepts and themes that are distilled from the data.

Dependability deals with the consistency of constructs created in the study. Are these constructs usable over a longer time frame. Can the same themes and the ultimate theory be used to describe similar phenomena in future studies. describe validation as a concept in qualitative research.

D.2 Validation of this study

This study uses several of the aspects mentioned in the previous section.

Credibility is ensured by validating the results through a return to the participants in a focus group. The focus group, where all participants are anonymous allows for discussion to ensure to a deeper degree the different viewpoints regarding the conclusions presented.

Dependability is ensured by using a interview protocol presented in appendix B.3. The use of this protocol ensures that some degree of comparability between interviews exists. The answers that were given in the different interviews regarding the subjects of the protocol were indeed comparable. Also the process of interviewing was consistent throughout the interviews. This enhances the dependability of the results.

By performing a final interview with a source not part of the main group of participants dependability is further enhanced. This interview also confirmed the main findings of the thesis.

Supporting conclusions in the main body of the thesis by verbatim quotes allows for the reader to verify interpretations increasing confirmability. Also the transcripts of all interviews are available on request, allowing future researchers to compare their interpretations to those in this thesis.

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