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University of Turku

ABSTRACT

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Author	Tuukka Rissanen	Student number	515398
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Supervisors	Dr.Sc. & Ph.D. Kari Liuhto, M.Sc. Elisa Aro		

Abstract

The construction industry in Finland is booming and it is not unusual to have multiple different subcontractors and nationalities operating in construction sites. In addition, the construction projects are increasingly challenging and new construction methods are introduced, one of which is wood construction which is discussed in this study. Furthermore, the increased complexity of the projects has created unprecedentedly demanding construction sites in terms of management. One important aspect of successful construction project management is the proper selection of a subcontractor that can fulfill the requirements of a project.

The purpose of this study is to analyse, based on a theoretical framework and empirical research, what criteria were used in the selection process of an international subcontractor. The example in this study is a Finnish wood construction site where a Norwegian construction firm works as a subcontractor for a Finnish company.

The empirical research is based on an interview where the person responsible for the subcontractor selection was interviewed. The objective was to analyse what criteria were used in the selection process and how those criteria were evaluated. In addition, one objective was to find out if there are any notable aspects that were not addressed in the earlier empirical studies on the theme.

Findings from the study indicate that earlier empirical research and the chosen theoretical framework are coherent with the results from the interview. When it comes to the selection criteria, the most important criteria were past performance, experience and quality and safety. In addition, the study supports existing research which has suggested that the criteria should always be emphasised and evaluated based on the project specific requirements. The most significant finding was the observed effect of earlier business relation to the selection process. In a situation where the contractor and a subcontractor have a successful cooperative background, the earlier business relation can be used as a reference to evaluate the selection criteria. In other words, the earlier business relation facilitates the selection of an international subcontractor and reduces the extensive evaluation of the selection criteria. The effect of earlier business relation to the use of selection criteria was the most crucial finding that was not addressed in the earlier empirical research on the topic and it should be taken into account in the international subcontracting.

Key words	Subcontracting, international subcontracting, selection criteria, construction industry
Further information	

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Tiivistelmä

Rakennusteollisuus käy läpi noususuhdannettaan Suomessa ja alalla on vakiintunut käytäntö, että työmailla toimii useita eri alihankkijoita sekä kansalaisuuksia. Tämän lisäksi projektit ovat entistä haastavimpia ja uudet rakennustekniikat tekevät läpimurtoaan alalla, josta esimerkkinä mainittakoon tutkimuksessakin käsitelty puurakentaminen. Lisäksi toimintaympäristön ja projektien haastavuus tekevät rakennustyömaiden johtamisesta entistä vaativampaa. Yksi tärkeä osa johtamista on hallita alihankintaketjua ja pyrkiä valitsemaan paras mahdollinen alihankkija, joka pystyy vastaamaan työmaan vaativuustasoon. Valinnassa tärkeässä osassa ovat luonnollisesti valintakriteerit.

Tämän tutkimuksen tarkoitus on analysoida, teoreettisen viitekehyksen ja esimerkkitapauksesta johdetun empirian avulla, mitä kriteereitä esimerkkitapauksen yritys on käyttänyt valitessaan ulkomaisen alihankkijan. Esimerkkitapaus tutkimuksessa on suomalainen puukerrostalokohde, jossa alihankkijana suomalaiselle yritykselle toimii norjalainen rakennusyritys.

Tutkimus toteutettiin haastattelututkimuksena, jossa alihankkijan valinnasta vastaavaa tahoa haastateltiin teoreettisen viitekehyksen mukaan rakennetun haastattelupohjan avulla. Tavoitteena oli ensisijaisesti kartoittaa, mitä kriteerejä valinnassa on käytetty ja kuinka kyseisiä kriteerejä on arvioitu valintaprosessissa ja tuleeko esiin huomionarvoisia asioita, mitä teoreettisessa viitekehyksessä ei oltu käsitelty.

Tutkimuksen tuloksista voi päätellä, että aiempi tutkimus ja teoreettinen viitekehys ovat varsin hyvin linjassa esimerkkitapauksen empiriasta saatujen tulosten kanssa. Erityisen tärkeiksi kriteereiksi valinnassa koettiin aikaisempi kokemus, aiemmat näytöt ja referenssit sekä työn laatu. Tämän lisäksi tutkimus tukee aikaisempia tutkimuksia siinä, että kriteereitä tulisi aina arvioida ja painottaa tapauskohtaisesti perustuen kyseisen kohteen vaatimuksiin. Tutkimuksen tärkein löydös oli kuitenkin aikaisemman liiketoimintasuhteen vaikutus alihankkijan valintaprosessiin. Kun toimijoilla on taustalla toimiva suhde ja aikaisempia yhteisiä kohteita, voi tätä suhdetta käyttää referenssinä, jonka pohjalta valintakriteereitä arvioidaan. Aikaisempi liiketoimintasuhde siis helpottaa ja tehostaa kansainvälisen alihankkijan valintaa, jolloin monien kriteerien arvioinnille ei enää ole tarvetta. Aikaisemman liiketoimintasuhteen vaikutus alihankkijan valintaan oli tärkein poikkeava löydös, jota lähdekirjallisuudessa ei käsitelty, ja joka tulisi ottaa huomioon alihankkijan valinnassa.

Asiasanat	Alihankinta, kansainvälinen alihankinta, valintakriteerit, rakennusteollisuus
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SELECTION CRITERIA IN INTERNATIONAL SUBCONTRACTING

An example from the Finnish wood construction industry

Master´s Thesis
in International Business
Kansainvälisen liiketoiminnan
pro gradu -tutkielma

Author/Laatija:
Tuukka Rissanen

Supervisors/Ohjaajat:
Dr.Sc. & Ph.D. Kari Liuhto
M.Sc. Elisa Aro

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1 INTRODUCTION

1.1 Selection of the theme

Throughout the history of mankind, construction has played an extremely important role. It is quite impossible to find a society that does not have a construction industry and constructions of some sort. Even though the level and amount of construction differentiates immensely between countries, essentially in every society the construction industry is inevitably present.

It is apparent that the industry has developed radically over the years. From the primitive ways of laying bricks onto each other, nowadays we see increasingly developed tools and methods that improve productivity and enable the execution of even the most demanding and imaginative projects. In addition to the methods of construction, building materials are developing and changing. A case in point is wood construction that has made its way to the apartment building sector which means that in the future we are likely to see more wooden apartment buildings in addition to traditional ones made primarily out of concrete.

On the other hand, there are numerous challenges related to the industry. It is, for instance, extremely vulnerable to fluctuations in the world economy. In addition, the increasing complexity of the projects has created unprecedentedly demanding construction sites in terms of management. There are increased amounts of sites that have numerous parties involved in the process which makes the coordination and project success more difficult than ever before.

It is self-explanatory that successful management of construction sites presupposes successful management of subcontractors as well. The more familiar the main contractors are with the subcontractors, the easier it is to succeed in a specific project. A crucial part of this process is the proper selection of a subcontractor that can match the requirements of a specific project. If the selection process is not done properly, the project can be doomed without having even started.

The prevalence and growth of the construction industry combined with the increasing significance of proper subcontractor management have played an important role in the theme selection. There is also an increased amount of international aspects related to the construction industry and one of these aspects is international subcontracting where the contractor and subcontractor originate in different countries. Due to these reasons, the theme of this study is current, important and should provide important insights and results for the managerial personnel working in the construction industry and dealing with subcontracting. The purpose is, through an example case and academic research, to investigate how subcontractors are selected and based on what criteria. In addition, the

relatively new sector of wooden apartment house building in Finland adds an interesting factor to this study.

It should be added that one reason behind the selected theme is the personal interests and background of the researcher. The author of this study has worked in the field of construction for several years in multiple roles from actual construction work to sales in the role of a supplier. Therefore, the history of the author influenced the theme selection in addition to the reasons mentioned above.

The following subchapters will provide a more detailed picture of the construction industry and its state and history in Finland. In addition, the current situation of subcontracting in the construction industry is discussed. Finally, existing empirical research on contractor selection criteria is presented, leading to the final objective of this study.

1.2 Construction industry in Finland

The construction industry in Finland has an extremely important societal effect. The value of the industry was 31.8 billion euros in total in 2016. Out of the 31.8 billion, 25.3 billion is in the field of residential building and the remaining 6.5 billion is water and land construction. The value of the construction industry covers around 5.5% of the gross domestic product of Finland. The impact on the Finnish job market is crucial as well since the industry provides around 500,000 man-years. (Confederation of Finnish Construction Industries RT 2017a).

However, the industry is extremely vulnerable to the economic cycles and the amount of construction and the amount of labour in the industry follow the economic ups and downs. There have been a few examples of this in Finland during the past decades: first the recession in 1988-1992 and then the global financial crisis in 2008. Both crises negatively affected the construction industry. It can be said that by nature the construction industry is cyclical and highly interlinked with the prevailing economic environment. In addition, compared to some other industries the construction industry seems more sensitive to the fluctuations in economy. Figure 1 shows the development of new construction during 1971-2009 and illustrates the radical drops during the two economic downturns.

Figure 1 The development of new construction in million cubic meters (m^3) between 1971-2009 excluding renovations

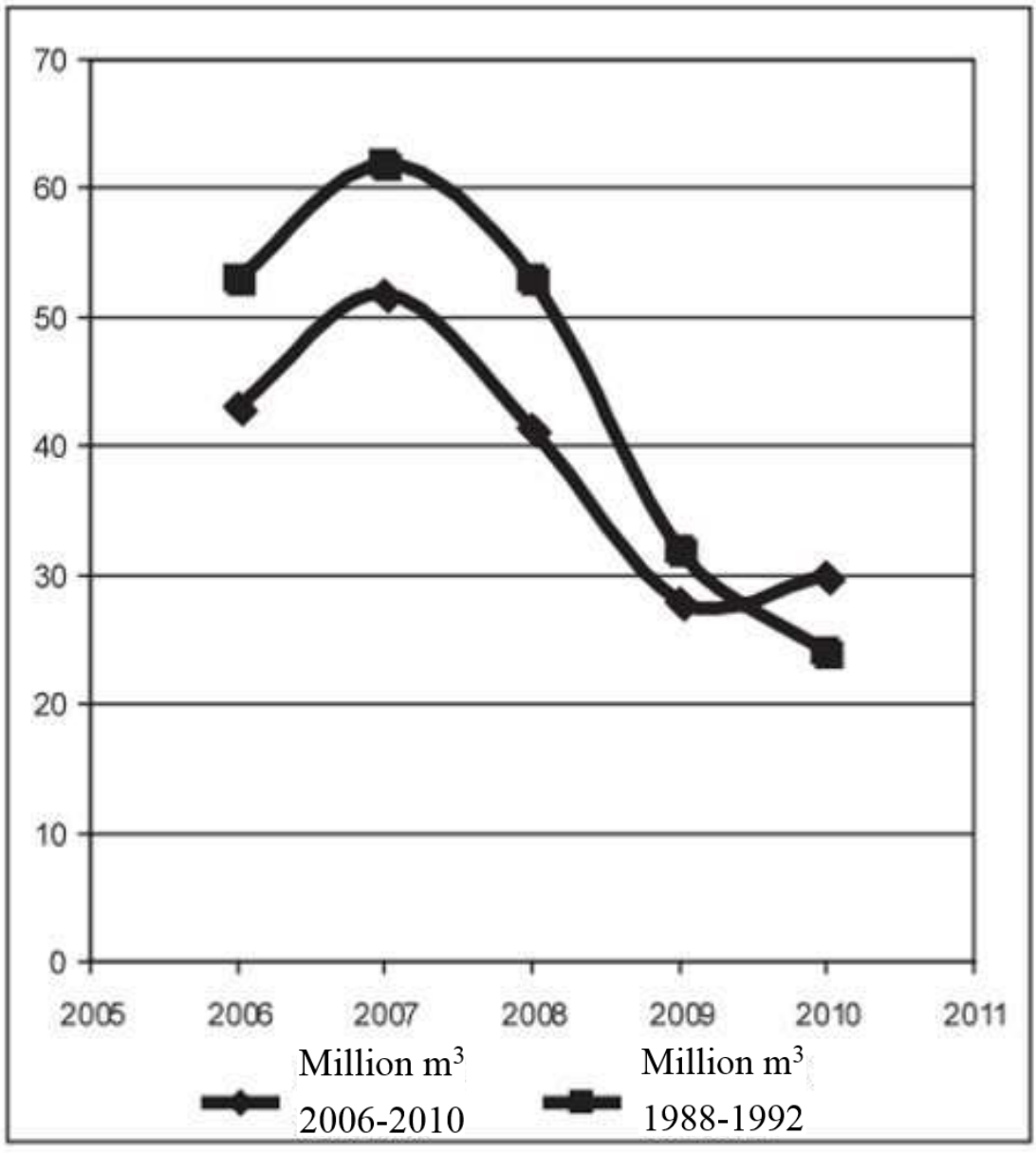
Source: Ahti (2010, 489)

As it can be seen, the construction industry has flourished before every drop. When the economy is healthy and growing, the purchasing power, lending and investments subsequently grow, accelerating the building industry in turn. This works the other way around as well; during economic downturns, there is not much demand for building and the industry drops, and often hard (Ahti 2010).

Figure 2 shows the last decline of the industry in Finland in 2007 and compares it to the recession in 1988-1992. Although in both cases the drop was extremely steep, the curve from years 2007-2009 shows sooner recovery. Ahti (2010) argues, that the

construction industry is competitive and it is still an agile industry that will eventually cope with the deep drops in several ways. Therefore, despite the extreme ups and downs that the industry has lived through, the construction industry in Finland is still evolving and growing. As Ahti (2010) states, the recession could be seen as a possibility and the industry should always prepare for upcoming growth.

Figure 2 The steep drop in new construction in 2006-2010 compared to the drop in 1988-1992 in million cubic meters (m^3)

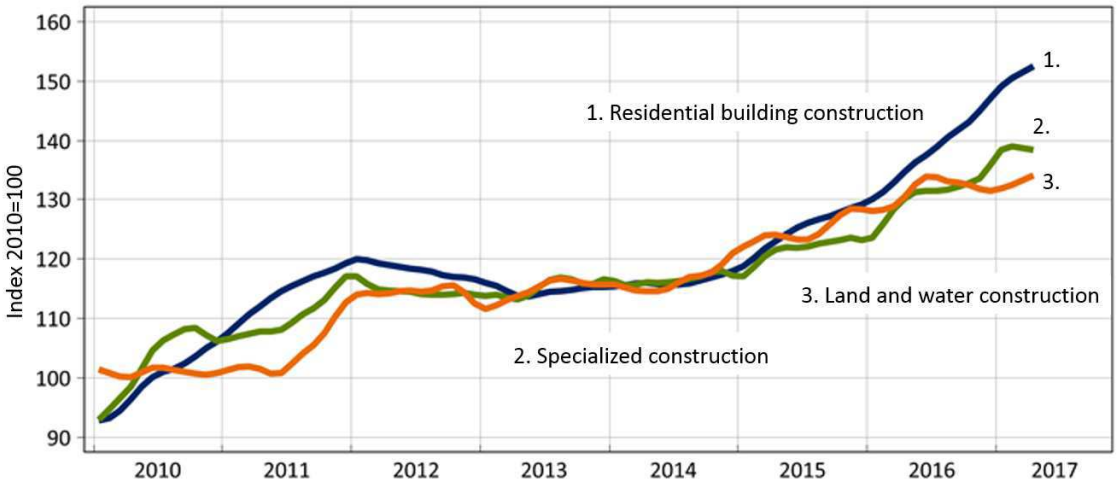


Source: Ahti (2010, 494)

It is evident that in the past the industry has declined and grown cyclically. In its current state, the industry appears to be booming. The Ministry of Finance (2017) of Finland reported a 7% growth rate in the field of construction in the year of 2016. In the same report, there was an estimated growth of 1-3% in the years 2017 and 2018. The

growth is declining, but there is still decent growth during the following years considering that year 2016 in the field of construction was exceptional in terms of the growth in Finland (Ministry of Finance 2017). In fact, when measuring the amount of construction, in the year 2017 the industry exceeded the last all-time high which was in 2010 (Confederation of Finnish Construction Industries RT 2017b). Figure 3 illustrates how steeply the construction industry has been booming in terms of revenues compared to the index year of 2010.

Figure 3 Diagram on the revenues in the Finnish construction industry



Source: Confederation of Finnish Construction Industries RT (2017b)

The growth and increasing demand have led to a situation where the construction industry is continuously more international. The construction industry in Finland intrigues both foreign firms and employees. A current case in point, according to Juvonen (2017), currently the largest constructions sites in Finland can hold up to a total of 40 different nationalities within the project. This number includes both the foreign workers as well as the foreign subcontractors.

1.3 Wood construction in Finland

When it comes to the building materials, wood as a construction material has served the Finnish construction industry throughout its history. Especially in the building sector vacation houses, detached houses and semi-detached houses have favoured and still favour wood as construction material. Of the 30,000 houses that are built in Finland every year, approximately half belong in the category of detached and semi-detached houses. Out of these, in over eight out of ten cases the frame is made out of wood and in around

three quarters of the houses the façade is built from wood. Out of the vacation houses built in Finland wood is used in 99% of the construction sites. (Karjalainen 2017).

Currently, in addition to smaller housing, wood has become a viable construction material in apartment house building. This can be said to be an extremely important market in Finland since, according to Karjalainen (2017), 44% of all the Finnish houses are in the apartment housing sector and around half of all the newly built houses are apartments. Karjalainen (2017) also argues that despite the fact that concrete has dominated the apartment building sector, wood is becoming increasingly important especially due to the changes in fire safety legislation that nowadays allows wood to be used in apartment buildings 5-8 stories high.

The future potential of wood as a multi-purpose construction material has been acknowledged also by the government officials. In fact, the current government of Finland has an on-going key project called Wood on the move and new products from the forest (Ministry of Agriculture and Forestry n.d.). The goal of this government driven project is to support the Finnish forestry industry and the key part of that is to support the wood construction industry as well. The societal significance of wood construction in Finland derives from its importance in the job market since the wood and forest industry employs around 30,000 people. In addition, wood construction knowledge and wood as raw material are both important export goods and hence support the Finnish economy. In addition, the environmental and climate effects contribute to the societal meaning of wood construction industry; when wood is used in buildings as construction material, carbon dioxide is bound to the wood for up to a hundred years. Hence, the carbon dioxide stays out of the atmosphere. There are many factors that make wood construction an environmentally friendly method of building, such as the renewability of wood and the fact that in Finland wood can be produced locally and near the construction sites. (Ministry of the Environment 2016; Karjalainen 2017; Ministry of Agriculture and Forestry n.d.).

It can be said that wood construction is making a breakthrough in the apartment house building sector and it is offering a valid competitor to concrete. However, since the wood construction industry is still quite new, there are challenges related to it. An interview study by Haapio (2013) summarises that one of the most viable weaknesses of wood construction is the lack of knowledge and experience. In addition, in the same study, there was a conclusion that a fear of failure exists related to wood construction and the construction professionals agree that the industry should be developed further. Especially the lack of experience and knowhow in the field of wood construction is a concern in Finland. There are currently only a handful of contractors that can manage the wood construction projects and at the same time the amount of wood construction is increasing (Törmänen 2014).

In conclusion, despite the increasing use of wood as a construction material there still exists prejudice towards wood construction in Finland. For instance, in Finland only 3-4% of the newly built apartment buildings are made of wood while in Sweden the number is 20% (Törmänen 2014). In addition, there exists a lack of experience and knowhow that acts as a barrier for the actual breakthrough of wood construction. The lack of experience makes the wood construction interesting also in terms of subcontracting since it can be difficult to find experienced subcontractors in the field of wood construction. It is fair to argue that in Finland the wood construction industry in the field of apartment building is emerging but not without challenges. Due to these reasons, this industry was selected as an example for this study. The example project that is studied is called Wood City and it is currently one of the most well-known wood construction projects in Finland. Wood City is located in the Helsinki downtown area and will become the highest wooden apartment house in Finland when complete (Lättilä 2016). The project is described in-depth in Subchapter 4.1.

1.4 Subcontracting in the construction industry

Nowadays the building sector is increasingly operated through subcontracting. According to Matthews et al. (2000, 493) "over 90% of the construction projects are undertaken by subcontractors" and the main contractors now focus more on "managing the subcontractors rather than employing their own people". Hence, in order to improve performance and productivity, main contractors should focus more on the relationships with subcontractors (Eom et al. 2008). The decision to subcontract usually solves problems related to a shortage of resources, lack of expertise in special tasks or limited financing (Elazouni & Metwally 2000). The significant role of subcontracting is generally agreed on and there is an increasing focus put on the subcontractor selection phase as well since the selection influences the project as a whole (Abbasianjahromi et al. 2014).

In Finland, for instance, in order to handle the growth and to ensure success, an increasing number of the construction firms are using subcontractors in their operations. A questionnaire done by the Ministry of Finance (2017) of Finland reported that 70% of small and medium-sized construction firms are going to use more subcontracting in the future. In addition, not only is subcontracting increasing, but the internationality of it as well. In fact, In Finland, 17% of construction workers are foreigners, and a majority of them are from Estonia and other Baltic countries (Ministry of Finance 2017).

However, the extensive subcontracting in the field of construction creates problems in on-site management and communication due to the multilevel hierarchy of construction projects. It can be argued that the poor quality on-site is usually related to the subcontracting practises and subcontractor selection. (Choudhry et al. 2012).

Problems emerge in terms of globalisation as well. This means that there is an increased amount of international subcontracting as well as subsequent obstacles, such as challenges in communications, delays and shortcomings in quality requirements. (Iwinski 2015).

Hence the importance of an efficient and trustworthy subcontractor. Especially in the selection phase it is crucial to pay attention to the selection process and the criteria that a subcontractor is chosen with. When it comes to the selection phase, there are several criteria to be used and each with their relevance depending on the project or case. The selection through a set of criteria is a highly important part of a project and project planning (Rashvand et al. 2015). In addition, a selection through stringent criteria increases the success of the project in terms of cost, time and quality (Hatush & Skitmore 1997a).

The selection of a subcontractor is usually done by evaluating multiple criteria related to the subcontractor and the project specific requirements. The goal of evaluating specific criteria in the selection phase is to "ensure that only subcontractors who have the ability to deliver are shortlisted and awarded the subcontract" (Mbachu 2008, 484).

The examples and statistics clearly indicate that there is a continuous need for subcontractors in the construction industry. On the other hand, there is increasing demand for proper management of subcontracting since it has a direct effect on the success of construction projects. One of the ways to manage subcontracting and avoid problems is to focus on the selection of proper subcontractor with a valid set of criteria.

1.5 Earlier empirical studies on contractor selection criteria

In the process of selecting a subcontractor, main contractors tend to use certain criteria for the evaluation of the subcontractor's ability to meet the requirements of the construction project. This section will go through earlier empirical research related to contractor selection criteria. In existing research, much focus has been put on the definition of key criteria as well as on the evaluation of these criteria. In addition, there have been studies on how each of these criteria correlate to the success of construction projects. The table on the earlier research on contractor selection criteria is found in Appendix 1.

An expert interview-based Delphic-study by Hatush and Skitmore (1997a) proved that there exists a set of dominant contractor selection criteria that affect all three project success factors which are time, cost and quality. The key selection criteria according to Hatush and Skitmore (1997a, 129) were "past failures, financial status, financial stability, credit ratings, experience, ability, management personnel and management knowledge".

NG and Skitmore (1999) developed a questionnaire among 192 client and consultant firms to evaluate the importance of different criteria. The results indicate that there exists a gap between the emphases on each criteria meaning that, for instance, customers and consultants have different evaluations of the contractor selection criteria. In addition, there exists a difference between public and private clients. However, despite the differences, a set of the main criteria for contractor selection were found (NG & Skitmore 1999, 614): "financial stability, performance, fraudulent activity, stability of firm, failed contract, standard of quality, health and safety, and competitiveness".

NG et al. (1999, 162) further identified that differences in perceptions occur between different professionals working on the same project. There are differences between "architects, civil engineers, quantity surveyors and project managers" resulting from the differences between the expertise and training of the professionals. The results indicate that the emphasis that is placed on each selection criterion is not universal since people have different perceptions and opinions.

Banaitienė and Banaitis (2006) identified in their survey that the criteria used in contractor selection should be defined according to the characteristics of the construction project. For instance, the size and complexity should play a role when the criteria are defined. In addition, there should be a prioritisation of criteria based on the project specific characteristics.

Mbachu (2008) concludes that quality of work is the most important criteria in subcontractor selection. On the other hand, Mbachu (2008) states that there should be an evaluation of the ability of a subcontractor to meet the project requirements. These abilities should then be used as selective criteria.

According to Doloi (2009), the most fundamental criteria that have an effect on the success of a project are sound business and finance, the technical expertise of employees, past performance in terms of successful projects and the safety records. Interestingly, these criteria were to a large extent different from the criteria that were perceived as the most important ones: "on-time delivery, complying with quality specifications, safety performance, site safety records and flexibility in work schedule" (Doloi 2009, 1260).

Hartmann et al. (2009) found in their study that even though contractors do usually use multiple criteria in the selection phase, the emphasis on each criterion is not balanced. Different project specific characteristics require different emphasis and encompass trade-offs: if a contractor puts emphasis on specific criteria, it means that at the same time the contractor has to give up emphasis on some other criteria. For instance, if price is emphasised, the contractor cannot necessarily expect a better quality compared to a more expensive subcontractor.

From the earlier empirical research, it can be concluded that certain aspects of criteria exist that are considered important regardless of the project specific conditions. These criteria are financial stability, past performance and experience, quality, on-time delivery

and onsite safety. However, as the earlier research shows, the emphasis on the criteria depends on the characteristics of a project. So even though there seems to exist a set of main criteria that is agreed on among the scholars, the use of these criteria varies across different projects. In other words, the mentioned set of criteria is repeated throughout different studies but how the criteria are evaluated and used in the selection process differentiates depending on the evaluator's own perceptions and project specific characteristics and conditions.

1.6 Objective of the study

The subcontractor selection plays a significant role in the planning, management, and outcome of successful projects. Applying the relevant criteria influences the final selection and therefore the importance of criteria in subcontractor selection cannot be emphasised enough.

Due to the trends of growing industry, increasing subcontracting and internationalisation, the theme of selection criteria in subcontractor selection, especially in an international context, is both interesting and important. Hence, based on the criteria formed in previous studies, the aim of this study is to analyse what criteria Stora Enso applied when choosing Woodcon Ltd. as their subcontractor in the Wood City construction project using the criteria model of Nasab and Ghamsarian (2015).

The criteria model of Nasab and Ghamsarian (2015) which is used as the framework in this study is presented in Figure 6 and discussed in Subchapter 2.1.3. Subchapter 2.1 presents other possible candidates and draws a conclusion to the decision to use the model of Nasab and Ghamsarian (2015) after a brief comparison between the models.

2 THEORETICAL FRAMEWORK

This chapter focuses on the theoretical background and framework of this study. The first section of this chapter focuses on finding an appropriate model which is used as a theoretical base of this study. During the background investigation, multiple models were found that could be used, hence an evaluation was done in order to select the most suitable model for this study.

After the evaluation of the models, a more in-depth analysis was done based on the structure of the chosen model. Earlier literature was evaluated in order to gain a more in-depth understanding of the details of the model that was selected as the basis of this study.

The section will provide information on the theoretical framework that this study will follow. In addition, it is structured based the selected model. The same structure will be then used later on in Chapter 4 which will go through the empirical findings.

2.1 Comparison of appropriate models related to contractor selection criteria

The purpose of this subchapter is to present and evaluate different models related to contractor and subcontractor selection. In each model, there is a set of criteria that are identified based on empirical studies and/or earlier research. The purpose of these models is to support the subcontractor selection process by identifying the valid criteria.

Based on the earlier literature related to subcontractor selection criteria, the following models have proven to be the most suitable ones to support the theoretical framework of this thesis and hence the following three models are presented. In all of the models that are discussed, the criteria have been formed based on the earlier studies on contractor selection criteria and empirical research on the subject. In addition, these models are constructed to be used in the actual selection processes. Therefore, these models are considered to serve as a base for the theoretical framework.

Through evaluation and comparison of these models, the objective is to select the most suitable model as the theoretical base of this research. The final selection of the chosen model and the main reasons behind the selection are presented in Subchapter 2.1.3.

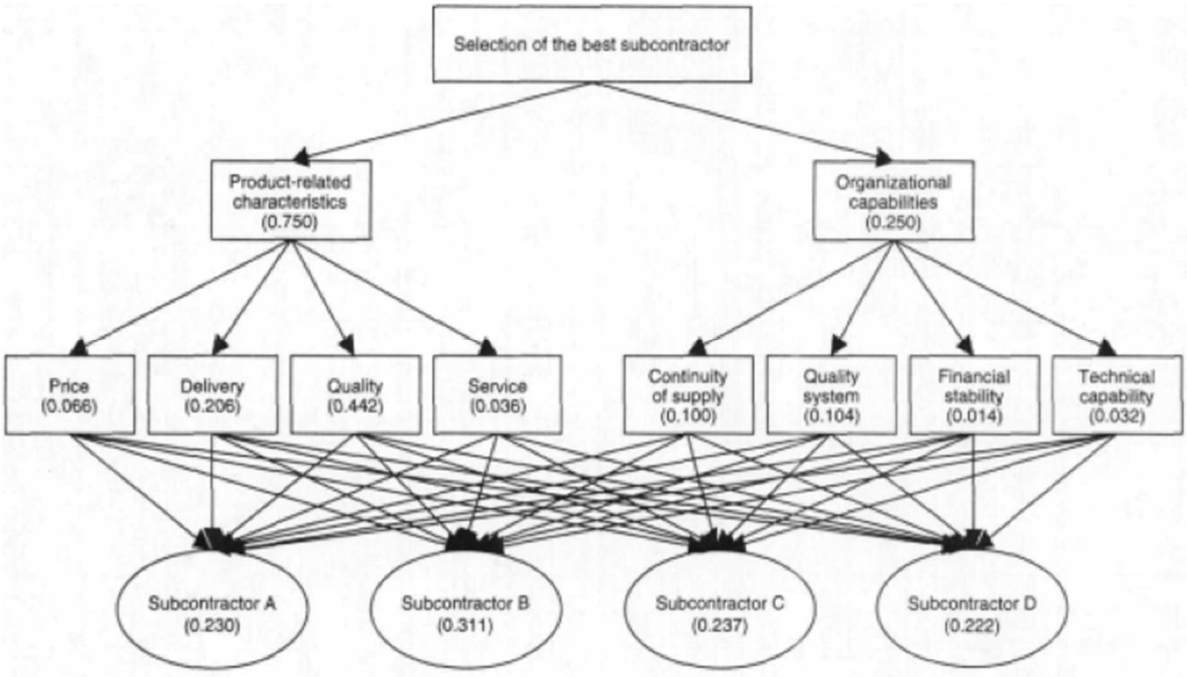
2.1.1 Selection criteria by Partovi et al.

Partovi et al. (2002) conclude in their model the necessary criteria that should be under investigation when selecting a proper subcontractor. As seen in the model presented in Figure 4, Partovi et al. (2002) have developed a dual model which differentiates it from

the other models. This means that their model separates the criteria first to product related characteristics and organisational capabilities. Then, under these categories are the specific selection criteria as well as their sub-criteria.

This type of model where a division between the organisational capabilities and the actual product or performance related characteristics exists gives the model a clear structure. However, the model is developed for the use of a rubber company so it is likely that this type of model is more suitable for factory manufacturing purposes. In that type of industry it is easier to make a division between the product and organisational characteristics. Hence, this model is not considered to fit this study since, despite its structural strengths, it does not fit in to the construction industry which is the focus of this research. In addition, the year of publication being 2002 raises concerns about whether this model is outdated.

Figure 4 Selection criteria by Partovi et al.



Source: Partovi et al. (2002, 16)

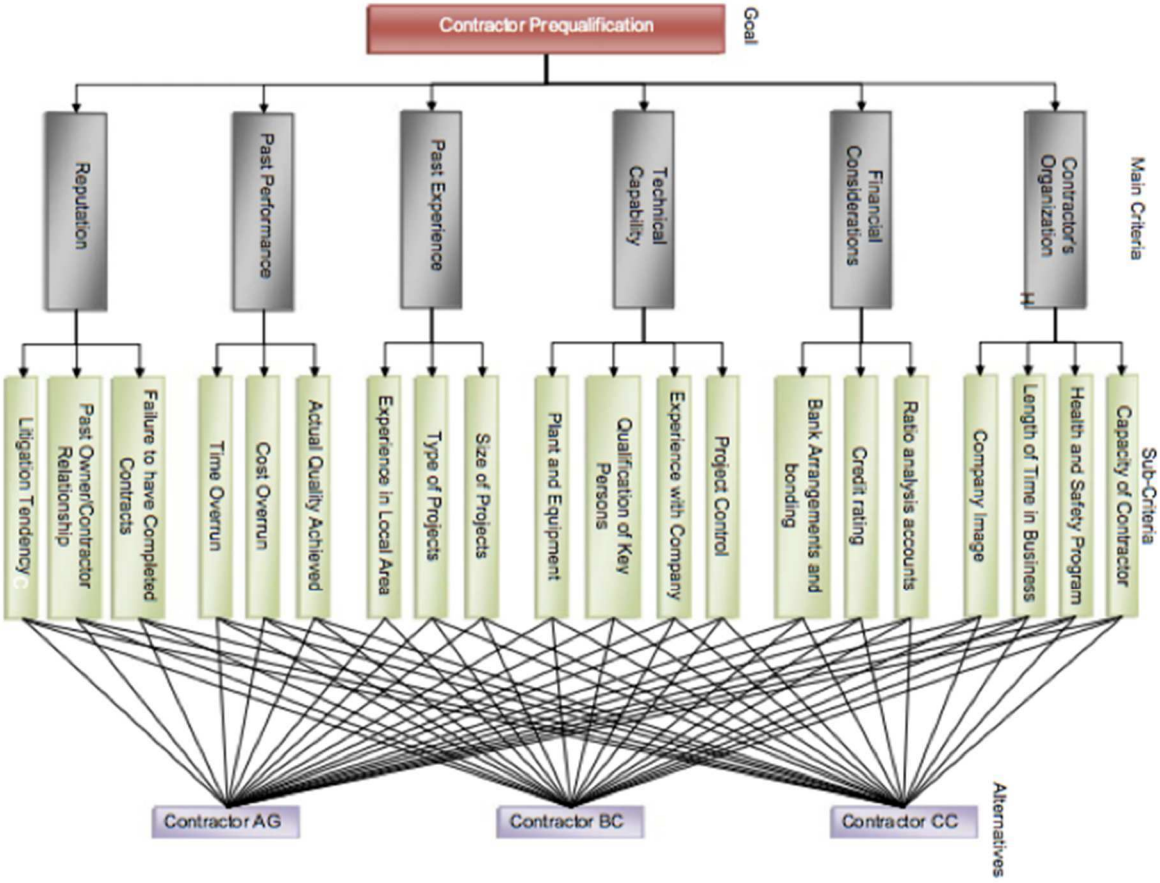
As seen from the model, the structure is logical and understandable since it places the criteria under two main topics. In addition, the criteria itself are in line with earlier research. In conclusion, the model itself offers a clearly structured option with valid criteria but at the same time it does not match the industry of this study and it can be considered to be somewhat outdated.

2.1.2 Selection criteria by Hosny et al.

Hosny et al. (2013) combined earlier literature with expert opinions and interviews to deduce the selection criteria seen in Figure 5. This model is for the support of subcontractor selection processes and indicates the necessary criteria along with their sub-criteria.

The model is related to the construction industry and it is a recent one in terms of the year of publication. The criteria presented in the model are valid and reflect both the earlier literature as well as the empirical study of the researchers.

Figure 5 Selection criteria by Hosny et al.



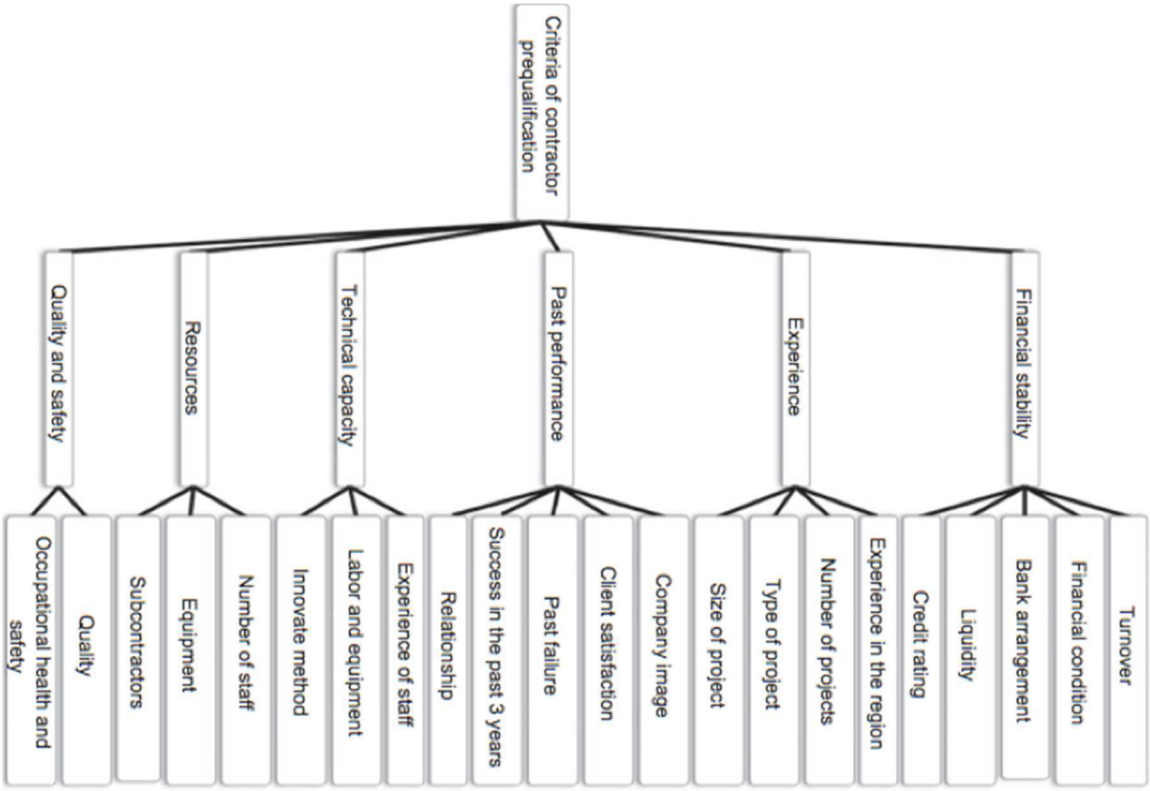
Source: Hosny et al. (2013, 388)

As seen in Figure 5, the researchers have developed a clearly structured model that addresses valid criteria in terms of contractor selection. However, despite the strengths of the model, it still was not the most recent one and the structure of the model is more suitable for analytical hierarchy processes and decision making, rather than supporting the theoretical structure of this study. In other words, the model is more suitable for different purposes and it is therefore not chosen.

2.1.3 Selection criteria by Nasab and Ghamsarian

Nasab and Ghamsarian (2015) developed their model based on earlier research and their own empirical research. This empirical research was done among industry experts whose opinions were gathered in the form of a field study. The results were then evaluated together with the criteria formed in earlier research and this process was the base of their selection criteria model shown in Figure 6.

Figure 6 Selection criteria by Nasab and Ghamsarian



Source: Nasab and Ghamsarian (2015, 440)

The model provides a rather simple and understandable structure that lists six main criteria that are used in contractor selection. Each of these criteria encompass sub-criteria which facilitates the process of understanding the content of each criteria. The presentation of sub-criteria helps, for instance, in separating the content of past performance and experience which can overlap if the criteria are not specified.

In addition, the model is developed specifically for the use of construction industry and it provides recent information in terms of the year of publication. Since the content of the model is validated by industry professionals, the criteria can be considered valid and relevant to the construction industry.

When it comes to the cons of this model, the original use of the model – as the first box in the hierarchy describes – was for the prequalification of contractors instead of

subcontractors. In other words, the model was not intended to be used as the actual selection tool and it was intended to be used in contractor, not subcontractor, prequalification. On the other hand, when it comes to the requirements of this study, this model was considered to be the best fit as the theoretical framework of this study. The following subchapter discusses the selection of the model of Nasab and Ghamsarian (2015) and the reasons behind the selection.

2.1.4 Selection of the most appropriate model

The model of Nasab and Ghamsarian (2015), detailed in Figure 6, was chosen as the theoretical basis of this study due to the following reasons:

1) In that specific model, the criteria match the industry in this study and the model is the most recent one to be found
2) The criteria are identified through expert interviews and previous literature, which increases the legitimacy of the model
3) The model is in line with earlier literature and follows the criteria that have had the most effect on project success (Hatush & Skitmore 1997a)
4) The structure is understandable and the criteria are universal and easily transferable to the context of this study despite the fact that the model was originally developed for contractor and not subcontractor selection processes

The subheadings of Subchapter 2.2 follow the selection criteria of the model of Nasab and Ghamsarian (2015) as seen in Figure 6. These criteria are considered to be the most relative ones considering this thesis and its context.

Note that price as selection criteria is not integrated into to this model since overall, when considering the long-term cost and performance, using price as a selection criterion will lead to higher overall cost (Kumaraswamy 1995). Doloi (2009) concludes that less attention should be given to using price as a dominant criterion since the complexity of modern projects reduces the importance of price as a traditional selection criterion.

2.2 Contractor selection criteria

This subchapter is structured based on the model of Nasab and Ghamsarian (2015) which was selected as the theoretical framework of this study. The following subheadings identify the contractor selection criteria that were introduced in Figure 6. The objective is to gain a deeper understanding on each criterion and identify how the criteria are

perceived in other academic sources, how the criteria are evaluated and what is the importance of each criterion. The following criteria are chosen by Nasab and Ghamsarian (2015) based on their evaluation of the earlier research combined with their own field study where the perceptions of construction professionals were evaluated. The criteria discussed are hence considered to provide the information needed to evaluate the example case of this thesis later in Chapter 4.

2.2.1 Financial stability

Financial stability as a selection criterion tends to have multiple different approaches as well as its sub-criteria. When using financial stability as a criterion, the choosing party can interpret characteristics such as working and operating capital, turnover, credit rating, and banking arrangements (Doloi 2009; Puri & Tiwari 2014). Nasab and Ghamsarian (2015, 440) divide the financial stability in the following five sub-criteria: "turnover, financial condition, bank arrangement, liquidity and credit rating".

The financial stability can be inspected for instance by looking at the financial statements of a contractor, by asking about the value of work, or through banking details such as references from bankers. When analysing, usually the party responsible for the selection evaluates the financial state of the past, the current, and the future (Hatush & Skitmore 1997b). According to Hatush and Skitmore (1997b, 28), this can be done by evaluating the income statement and balance sheet and investigating the following parameters: "credit status, bank status, bond status and published accounts reports".

The goal when evaluating a contractor's financial stability is, according to Sang Chan et al. (1998, 117), "to ensure that the candidate contractor has the financial capabilities to handle the exposure to risk that he/she will be taking". Bubshait and Al-Gobali (1996) emphasise the importance of financial stability since it signals whether the contractor can fulfil the financial needs of a specific project. The evaluation of financial stability is done for pointing out any financial pitfalls that might have a negative effect on project success but also to point out the strong elements that could be beneficial (Hatush & Skitmore 1997b).

Gholipour et al. (2014) describe that in the selection phase a solid financial status should be required. Financial indicators can give an insight into a contractor's long-term performance and standards. A financially stable contractor is also one that is most likely to supply products and services on time and secure that both are continuously available (Gholipour et al. 2014). Financial stability, in general, has an effect on the cost of the project, and therefore it is considered as an important criterion (Jakrapong & Liston 2003). The significance of financial capability as a criterion is also proven by Sik-Wah and Kit-Yung (2000, 551) whose survey proves that financial capability is considered to

be the most important criteria alongside with past performance and past experience. Financial capability in this context "focuses on the financial stability and backing of contractors".

In general, according to the earlier studies done in the field of contractor selection, financial characteristics and financial stability are identified among the most important criteria. Doloi (2009) states that financial status is widely used as a criterion and Hatush and Skitmore (1997b) state that financial stability and soundness is the most crucial criteria in the prequalification state of a contractor selection. Russel et al. (1992) identifies that financial stability is included in the top three most important selection criteria according to 173 construction professionals.

2.2.2 Experience

The term experience as a criterion withholds the following characteristics (Mahdi et al. 2002, 31): "(1) number of years working on similar projects and in construction generally, (2) total work volume on similar projects and in construction generally, (3) average work volume on similar projects and in construction generally, (4) working with different contract types (as indicator to the risk share willingness), (5) working in similar geographical conditions, and (6) working in similar weather conditions in similar projects."

Experience as a criterion is considered as a significant one and a lot of weight is put onto it when evaluating contractors. The experience is considered as an organisational factor and it is connected both to the reputation as well as the past performance of a contractor. The vague nature of experience that correlates either negatively or positively to other criteria makes experience an important criterion to evaluate. By evaluating experience, past performance and reputation for instance can be at least partially covered at the same time. (Watt et al. 2010).

A crucial part of experience is the local experience of a subcontractor. For example, local safety regulations, labour laws and climate are influential experience. Especially in international subcontracting these should be taken into account when evaluating experience. (Mbachu 2008).

In addition, the experience of the staff is important. Especially the experience in years among the key personnel of the potential contractor is important and should be evaluated. It is crucial to consider not only the experience of the contractor as a company but also the experience of its key personnel since these two do not go hand in hand. An experienced company does not guarantee experienced personnel. (Russel et al. 1992).

2.2.3 Past performance

A definition by Mahdi et al. (2002, 31) describes past performance with the following characteristics: experience in "(a) previous projects, and (b) in similar projects, in terms of (1) cost, (2) quality of work, (3) schedule, (4) safety, (5) client satisfaction, (6) relationship with subcontractors, (7) relationship with suppliers and (8) relationship with insurance companies".

Past performance as a selection criterion concludes the history of a contractor in several areas. Nasab and Ghamsarian (2015) identify the sub-criteria as company image, client satisfaction, past failure, success in the past three years, and relationship. Russel et al. (1992) describe the main areas to be in past performance, in the history of meeting schedules, performance quality, references, and cost.

Past performance as a criterion is important since it gives an indicator of a contractor's earlier success and it has an effect on project success as well since the good quality of performance reflects to the project success positively. (Doloi et al. 2011).

According to Russel et al. (1992) past performance is highly associated with references meaning that, most of the time, the past performance analysis is done through references obtained from the cooperative partners and clients from the earlier projects. Gholipour et al. (2014) describe that the amount of satisfaction or dissatisfaction of partners is important. The references are considered as relationship factors, which are important regarding performance history but also in terms of post-contract interaction (Doloi 2009). This means that it is considered important that the contractor is cooperative also after the end of a project and that "poor records of any conflicts and disputes" should be taken into account in the selection process (Doloi 2009, 1254).

Despite the support for the importance of past performance, Doloi et al. (2011) reported a contradictive result through a survey that indicates past performance to be one of the least important criteria. This might relate to how the emphasis on different criteria vary between the roles of decision makers and the complexity of a project (Banaitienė & Banaitis 2006; Watt et al. 2010). The importance of certain criterion might vary when the situational factors of a certain project are altered.

Past performance, according to many sources, belongs among the most important criteria when the objective is to achieve low risk and project success. Russel et al. (1992) place past performance in the top three criteria alongside with financial stability and experience. Watt et al. (2010, 58) consider past performance as the most important criterion to be evaluated alongside with technical expertise since these "reflect the greatest areas of concern and risk in achieving project objectives and stated outcomes, particularly when a significant engineering component is included".

2.2.4 Technical capacity

Regarding technical capacity, (Gholipour et al. 2014, 157) state that "to provide a consistently high-quality product or service, promote successful development efforts, and ensure future improvements, a firm needs competent technical support from its suppliers". As a selection criterion its importance is substantial since the project success relies on the technical abilities of a contractor (Doloi et al. 2011).

According to Doloi (2009), technical capacity in terms of technical knowledge is actually one of the main criteria due to its effect on the actual project success. So even though technical knowledge is not emphasised in the selection phase, it deserves attention since it correlates positively to the project success. In addition, Doloi (2009) concludes that the technical expertise of work force is the key to overall successful projects.

The technical capacity is mainly evaluated through the know-how of the staff. In the selection phase, the technical requirements and challenges that the project presents should be considered. Then, the technical requirements should be reflected into the technical capacity and the technical knowledge of the staff. The technical capacity of a contractor should, as a selection criterion, indicate whether the contractor meets the technical requirements it phases in a specific construction project. (Wong et al. 2001; Nasab & Ghamsarian 2015).

2.2.5 Resources

Resources as a criterion includes investigation of the resources, such as the work force, machinery and possibly subcontractors, of a contractor. The key is to evaluate whether the contractor can fulfil the requirements of a project with its current resources and if not, whether it is possible for the contractor to gain more resources before the start of a project. (Nasab & Ghamsarian 2015).

The work force is considered as a particularly important resource. Before the selection there should be a division between construction labour, management staff and key personnel onsite. This division is helpful when evaluating the work force resources. The emphasis on each work force category depends on the projects requirement. For instance, which is more required: management staff or construction workers. (Wong et al. 2001).

Some scholars suggest that the resources of a subcontractor are defined as the capacity available. Assets such as labour and machinery are defined as the resources and the subcontractor's capacity. It gives an indication of the subcontractor's ability to fulfil the project specific requirements in terms of the amount of labour, both work force and management staff, and machinery. (Doloi 2009; Watt et al. 2010).

In addition to the assets of a contractor, it is important to evaluate the external factors as well. Nowadays, it is not unusual that contractors are present in multiple different construction sites simultaneously. This creates a risk that the contractor exceeds its capacity due to many simultaneous projects. Therefore, during the selection process, it should be evaluated whether the contractor is able to handle the increased workload due to a new project. (Jennings & Holt 1998).

2.2.6 Quality and safety

Hartmann et al. (2009) conclude quality to be the second most important criterion in contractor selection. They indicate that, despite the existing quality control system at construction sites, the quality has a strong effect on the reputation of main contractors, especially today when it is possible that a large portion of the assembling and work is done by subcontractors (Matthews et al. 2000). This indicates that main contractors are more conscious about the quality in the selection process since the quality provided by subcontractors affects the reputation of the main contractor as well.

Quality as a selection criteria is considered among the most important criterion in the selection phase for a number of reasons. First of all, when emphasising quality, the goal of main contractors is to minimise rework. When the subcontractor is considered to match the wanted quality, the risk of rework is minimised which is a significant success factor of a construction project in terms of time and cost. (Mbachu 2008).

The importance of quality as a criterion arises from the problems that the lack of quality creates. In their study, Choudhry et al. (2012) found that the most crucial problems related to subcontracting are related to the lack of quality onsite.

As a crucial part of quality, the contactors' quality control systems should be evaluated as well. While the past performance and experience can be used to evaluate quality, the subcontractor's own quality control systems can give valid estimates of its quality of work. This is important especially in situations where proven references of quality from earlier projects are not available. (Doloi 2009).

Controversial findings are reported by Russel et al. (1992) whose questionnaire concludes that the quality and safety as a combined selection criteria do not show great significance nor importance in the selection phase.

When it comes to safety as a criterion, according to a study by Doloi et al. (2011), the safety records of construction sites are the main aspect to evaluate. Positive safety records are linked to the project success which further enhances the importance of inspecting the subcontractor's history of safety records.

2.3 A summary of the theoretical framework

It is evident that there seems to be a consensus among scholars about the importance and evaluation of the criteria chosen for this study. The six main criteria, based on the model of Nasab and Ghamsarian (2015), are valid and in many sources they are listed among the most important ones in the subcontractor selection processes.

There are, however, some controversial findings about the importance and evaluation of the selection criteria. For instance, when measuring the most important selection criteria, different studies tend to evaluate or rank each criterion differently. In addition, the definitions and analyses of criteria vary among scholars. A case in point, past performance and experience have slightly overlapping in definitions and quality and safety are in some sources discussed as separate entities rather than as one criterion. In addition, in some sources the technical capacity is considered as a part of the resources criterion but in the theoretical framework of this study it comprises its own separate criterion.

The explanation for these differences can be found in the setting of each study and the perceptions of the participants in each empirical study. All the evidence suggests that, when evaluating the most important criteria or how the criteria are ranked, it all depends on the project specific characteristic as well as the perceptions of the evaluators. In conclusion, there does not really exist a universal set of criteria to be used in the selection process. The criteria derive from the perceptions of main contractors and from the characteristic of the projects. These characteristics can be for instance (Mahdi et al. 2002, 31-32): "(1) project budget, (2) expected quality, (3) project complexity, (4) political factor, (5) project owner's willingness to share project risks, (6) project time schedule (7) project unique features, (8) sensitivity of design change, and (9) project owner's involvement in the management process"

Hence the emphasis and evaluation vary in each selection process and they are relative to the overall factors of a specific construction project. Trade-offs between different criteria should be expected meaning that a heavy emphasis on a specific criterion means that some other criteria cannot be emphasised as much at the same time. Simply any universal set of criteria have not been defined. The explanation appears to be that the emphasis and the use of specific criteria are dependent on the circumstances of a specific project. Hence, the set selection criteria tend to differentiate between projects and organisations. (Hatush & Skitmore 1997b; Doloi, 2009; Hartmann et al. 2009).

Nevertheless, the criteria based on the model of Nasab and Ghamsarian (2015) seem to be in line with other literature found on the topic. All of the criteria have proven relevance and importance in the selection processes and there are multiple evaluation methods for each criterion. In addition, the validity is increased by the method that Nasab and Ghamsarian (2015) used to develop the model. They carried out an extensive review

of earlier research and supported those results with their own empirical results. The empirical evidence was gathered among industry professionals which validates the results. The study of Nasab and Ghamsarian (2015) was conducted recently and since the publication year is 2015, it can be stated that the model and the criteria are up to date.

Taking all the above into account, the empirical research of this study follows the criteria discussed above and the structure of the model of Nasab and Ghamsarian (2015) which is shown in Figure 6. The model alongside with the criteria have proven validity and the both are in line with earlier research, hence they are used in this study to analyse the example case which is described in depth in Chapter 4.

3 METHODOLOGY

3.1 Research approach

Research methods are usually divided into two main forms of research: qualitative and quantitative (Koskinen et al. 2005). Those two can be distinguished most easily when they are compared with each other. A simple comparison can be done for instance as follows: quantitative study approach usually deals with numbers, statistics and testing hypotheses while qualitative research approach is focused on interpreting and explaining a more abstract phenomenon and socially constructed reality (Eriksson & Kovalainen 2008).

In the objective of this study – to analyse what criteria Stora Enso used when choosing Woodcon Ltd. as their subcontractor – the emphasis is put on to the word analyse. The word analysis describes the nature of this study and that the selection criteria as a complex entity are under investigation. Hence, the quantitative approach does not fit into the research approach and qualitative approach is chosen. The qualitative approach enables a more detailed, deeper, and analytical approach to the selection criteria and therefore it is a better fit for this study.

In addition, the research model described in the study is based on the model of Nasab and Ghamsarian (2015) and it has a structure that fits better to the qualitative study approach rather than quantitative. The model requires an investigation on the criteria and the objective is not just to answer the question of whether the criteria in the model is used or not. The objective is rather to analyse and answer how, why, and to what extent the criteria were used. These questions are better answered through a qualitative research approach.

The qualitative approach and data collection in this research is executed through an interview which is one of the most used forms of data collection methods. It can be described as “talk organised in the form of questions and answers” (Eriksson & Kovalainen 2008, 78). Koskinen et al. (2005) argue that interview, as a method, is the only method where it is possible to gather information about the interpretations and meanings that people have formed. Since, in this research, the aim is to gather information about the meanings, interpretations and experiences of the use of different selection criteria, an interview is chosen since it is the best tool for gathering the necessary data that is relevant to the objectives of this study.

The research is focused on analysing and understanding the criteria in depth through an interview which then leads to the development of the prior theoretical model. In other words, the research process develops through the empirical findings rather than the theory. The prior theory plays an important role but it is applied to the context of this

study through an example case which then proposes how the model should be altered or not and how valid it is to this research. (Eriksson & Kovalainen 2008).

3.2 Data collection

In research, there are two kinds of data. The secondary data, such as the theoretical framework in this study, is data that is available from books, journals and other studies. Primary data is the empirical data that the researchers have collected themselves. The empirical, or primary, information in this study was collected through an interview.

When selecting the sample that is under investigation, in this case the interviewee, there are two different ways of choosing it. A random sample is a sample that is selected randomly and it is usually used in quantitative research approaches. In this study, as well as in qualitative studies in general, the sampling is done by intentionally picking the sample so that it is "as informative as possible considering the research problem" (Koskinen et al. 2005, 273). Since the research objective is to analyse selection criteria, the interview was done with a person that was responsible for the subcontractor selection. In other words, the selection was based completely on the prior research design (Gubrium & Holstein 2001). The selected interviewee has the most knowledge about the used criteria and in addition, he presents a complete sample since no other person was responsible for the selection. Therefore, the small sample of one interviewee is acceptable.

There are a number of different interview types to choose from, and they all depend on the research questions at hand. Since the topic of this study focuses on analysing and the model is structured in categories and subcategories, the interview type is a guided semi-structured interview. Eriksson and Kovalainen (2008, 80) describe this type as having an "outline of topics, issues, or theme, but variation in wording and sequence; both 'what' and 'how' questions".

The research model in this study is based on the hierarchical structure where there are six criteria with their own sub-criteria. These six criteria allow for the division of the interview into six themes based on these criteria. Each theme is then openly discussed using the sub-criteria from the model as a guiding structure. During the interview, as the guided semi-structure interview permits, the interviewee can be presented with more detailed follow-up questions outside of the prior structure of the interview. The aim through this is to study both of these: experiences and point of views (Eriksson & Kovalainen 2008) and meanings and interpretations (Koskinen et al. 2005). The interview structure is found in Appendix 2 in English and in Appendix 3 in Finnish.

It should be considered that a semi-structured interview and a theme interview have a grey line between them and as terms they have been used interchangeably in business

research (Koskinen et al. 2005). The line in this study is formed by stating that the guiding is done firstly according to the theoretical model and secondly by the interviewer during the interview. This defines the interview as a guided semi-structured one.

The interview was opened through a general question about the business and the project. Then the discussion was lead to the theoretical model in order to cover all the criteria and sub-criteria from the theoretical model. In the final phase of the interview the objective is to map all of the criteria or issues affecting the subcontractor selection that were not discussed yet. This tests the validity of the theoretical model and how the situational factors such as the project specific characteristics have affected the used criteria. In addition, the most important criteria were defined at the end of the interview. These two questions in combination with the introduction related questions were the only ones that did not relate to the theoretical model.

Another option of data collection method would have been a completely unstructured narrative type of an interview where there are concepts to start with but where there is a freedom to guide the interview in any direction wanted according to the attractiveness of the topic (Eriksson and Kovalainen 2008). However, in this study the structure is straight forward and based on a clear research model. Hence, a vaguely structured open interview was considered not to be suitable for this study. Since there exists a ready set of topics and themes for the interview, a guided and semi-structured interview was selected since it is the most efficient interview type to analyse the selection criteria.

3.3 Data analysis

The analysis method used in this study was thematisation analysis. Essentially, the interview material was discussed in themes constructed from the interview according to the model of Nasab and Ghamsarian (2015). In other words, the interview material was divided under six themes that are the six criteria from the theoretical model. The goal was to gain more in-depth understanding on each criterion and if they match the criteria presented in earlier literature.

In addition, there are themes under interest that do not necessarily belong to the previous theoretical framework. For instance, if the interviewee discussed certain criterion that were not mentioned in the previous literature, it was taken into account. Through this the aim is to test the validity of the model in order to find if there is something missing or if there is a criterion that is not valid in the example context used in this study. The thematisation analysis simply aims to define how each criterion from the theoretical framework was used, how it was used, what the importance of it was, and how it was interpreted and analysed. Through this method, it is possible to investigate the validity of the theoretical framework and possibly to come up with new criteria or

controversially criteria that are not necessarily valid. Moreover, the analysis enables understanding of whether the criteria are more universal or tied to a certain context. The criterion outside of the theoretical framework is discussed in the summary of the main findings section.

Unlike usually in interview analysis, in this research the interview was not transcribed. This is because the set of topics under discussion follows the order of the theoretical model and hence the following is easy for the researcher. The taped interview is followed chronologically and then analysed under each category.

3.4 Evaluation of the study

The purpose of this subchapter is to evaluate the trustworthiness of this study. According to Lincoln and Guba (1985), trustworthiness can be evaluated through credibility, transferability, dependability, and conformability.

Credibility: When considering the credibility of a study, what should be evaluated is to what extent the researcher is familiar with the topic, if the data is valid to back up the argumentation and if other researchers can agree on the claims and links made in this study (Eriksson & Kovalainen 2008). Credibility can also be established through the use of different methods and peer reviews during the research (Koskinen et al. 2005). In this study, the researcher has worked in the field of construction and established prior knowledge on the industry and its functions. The research has been continuously evaluated by a fellow student group and academic supervisors through comments and suggestions for improvement.

Transferability: The purpose of transferability is to show a connection with the study or its parts and other prior studies on the topic, which indicates how similarities can be found in other contexts (Eriksson & Kovalainen 2008). In addition, the study should establish detailed and sufficient results so that others can transfer the study into other contexts in the future (Koskinen et al. 2005). Considering this study, it is fair to say that the context is quite special in terms of its technical complexity and background, which in that sense lowers the transferability. On the other hand, the prior research utilised in this study relies on generally applicable set of criteria, which are transferable to other contexts as well. The context of the example in this study however is its own kind and difficult to transfer.

Dependability: The researcher has a responsibility of providing information about the research process, which makes the research process “logical, traceable and documented” (Eriksson & Kovalainen 2008, 294). It can be established through auditing and documenting so that fellow researchers are able to evaluate it (Koskinen et al. 2005). This study has been under continuous auditing by two academic supervisors presented by the

educational institute of Turku School of Economics and the researcher himself has followed the general guidelines of a researcher.

Conformability: A trustworthy study establishes findings and interpretations that do not come across as falsified or imagined, which makes conformability "about linking findings and interpretations to the data in ways that can be easily understood by others" (Eriksson & Kovalainen 2008, 294). The point is to reduce bias of the researcher and it can be done through auditing, debriefing sessions with supervisors, the experience of researcher and triangulation, which is defined as using multiple different research methods (Shenton 2004; Koskinen et al. 2005). In addition, the researcher in this study was familiar with the industry and the study was under a continuous evaluation process by the assigned supervisors, which back up the conformability of this study. On the other hand, the number of examples presented is only one and the nature of the study structure made it difficult to use other methods than interview, which was the only research approach in this research paper.

When it comes to the ethics of the study, this research followed the general ethical guidelines of academic researchers. Especially in the data collection phase the researcher has strictly followed the ethical guidelines. The interviewee was asked for permission for the interview, as well as for permission to tape the interview and he was given the right to be anonymous and stop the interview at any point or refrain from answering certain questions. The taped interview material has been kept safe and only in the possession of the researcher. Contact details were given to the interviewee so that the interviewee has the chance to be in contact if necessary.

3.5 Introduction of the interviewee and the organisations

To begin with the role of the interviewee and his organisation called Stora Enso, the project at hand is not an ordinary one. In the construction project of Wood City, Stora Enso do not conduct any actual construction work and their role focuses solely on the supply of the wooden construction materials. The background is that since the organisation of the interviewee has launched new wooden construction solutions and materials, they started reference and pilot projects to support the future development of these products. Wood City acts as a pilot project that could be used as a reference project in the future. The complete entity of Wood City consists of four eight stories high apartment buildings as well as an office building and a hotel.

The interviewee has worked for Stora Enso for two and half years and in essence he started in the Wood City project. The role of the interviewee has been to lead the project and build the supply chain around it. This includes the coordination of the supply chain of the construction materials as well as the building of the subcontractor network around

the project. In addition, the interviewee is responsible for all the quality certifications related to the project.

As the project head, the interviewee has been building the network and supply chain that includes the Norwegian subcontractor called Woodcon. Woodcon is a Norwegian partner of Stora Enso and they have been a customer of Stora Enso in Norway. They have an extremely strong background and experience in wood construction, especially in the field of CLT[1] (Cross Laminated Timber). In the earlier projects Woodcon has been in the role of a customer using the wood products of Stora Enso.

In the planning phase of Wood City, the interviewee and Stora Enso started negotiations with Woodcon based on the earlier business relation. The idea was that Woodcon could help Stora Enso in the construction operations. Based on the negotiations, Woodcon agreed to join the project and Stora Enso chose Woodcon as their subcontractor.

[1] **CLT:** Cross-laminated timber, referred as CLT, is a solid wood based construction material. The elements can be up to 2.95 (width) times 16.00 (length) meters in size. CLT as construction material offers a carbon dioxide (CO_2) balanced building process, earthquake proof buildings and fast installation speed. In addition, it is lighter than concrete or brick. (Stora Enso Building and Living n.d.a)

4 EMPIRICAL FINDINGS

This section goes through the findings of the interview which is the empirical source of this study. The empirical findings follow the structure of the model of Nasab and Ghamsarian (2015) and at the end the main findings are concluded. Note that the interview was conducted in Finnish and that the following findings and quotes are freely translated by the author as accurately as possible. The interview structure is presented in Appendix 2 (English version) and Appendix 3 (Finnish version). In addition, it should be mentioned that despite the fact that this study discusses the construction project and the parties related to it with their real and existing names, the interviewee provided his own opinions as an individual. Hence, the interview as well as the empirical findings should not be related or connected to the organisations, parties or companies that operate in the example case of this study. In this chapter, the parts marked with quotation marks are direct quotations from the interview.

Subchapter 4.1 presents the example case and the reasons why it was selected as the example of this thesis. In the beginning of the interview the interviewee was asked to provide a brief review of his role and the case project. This introduction is discussed in the first paragraph.

After the introduction, the actual empirical findings on the selection criteria are presented and discussed. The structure as well as the interview follows the theoretical framework. Each criteria is discussed as its own entity under a subheading.

Subchapter 4.3 concludes the main findings of the empirical study in terms of the selection criteria. The goal is to provide an in-depth understanding on the selection criteria based on the theoretical framework and, in addition, to find out whether there were new aspects that the theoretical framework of this study did not take into account.

4.1 Example selection and description of the Wood City project

The example used in this research is a project called Wood City, which is located in Helsinki, Finland. It is a construction project where the buildings are made purely from wood and wooden elements. The main contractor in the project is Finnish SRV and main supplier of the wood elements is Stora Enso. The subcontractor Woodcon is from Norway and they have a contract relationship with Stora Enso, meaning that Stora Enso was responsible of the selection of Woodcon. At this point, it should be taken into account that the Wood City project is not a traditional construction project in terms of the supply chain. In other words, even though the main contractor is SRV, Woodcon is in a subcontractor relation with Stora Enso, which is the material supplier for the project.

When completed, the apartment houses are the highest in Finland made from solid wood (Wood City 2017). The project consists of eight-story high apartment houses containing 98 apartments in total. The complex includes office spaces and a hotel as well. The complex reaches 27,000 square meters in total and the only part of the complex built out of concrete are the foundations and elevator shafts. What makes the project interesting is that no other construction project in Finland exists where solid wood is used to build buildings as high as in Wood City. The target year for the completion of the project is set at 2019. (Lättilä 2016).

The key part of the project is the use of LVL[2] (Laminated Veneer Lumber) as the main building material alongside with CLT. The apartments and office facilities will utilise the LVL, but the hotel will be built using the more traditional CLT. CLT out of the two has been used globally in different construction projects but LVL, especially in Finland, is somewhat unknown. Due to this, Wood City as a construction project can be defined as a pilot project in terms of the use of LVL and generally in terms of the wood construction in Finland. Considering the size and publicity, Wood City is expected to determine the direction for the future of wood construction in Finland.

Woodcon and Stora Enso have a mutual business relation where both are suppliers and customers for each other: Stora Enso supplies the building materials and Woodcon is responsible for the building onsite. Their cooperative relation was first established in Norway, which is the main market of Woodcon. Woodcon has long experience in Norway specifically in the field of wood construction in cooperation with Stora Enso. Due to this history, Woodcon became one of the subcontractor candidates to work in the Wood City project in Finland. In autumn 2016, Stora Enso and Woodcon made an agreement that Woodcon will work as a subcontractor of Stora Enso in the Wood City project in Finland.

The interviewee works as a project manager at Stora Enso Wood Products. Currently his main duty is to lead the Wood City project in Helsinki. He has worked for Stora Enso for two and a half years and he came to Stora Enso mainly to lead the Wood City project. In addition, he is responsible for general business development and supply chain management.

The selection of this example case for this study was made simply due to the special nature of the project. The technical requirements are above average and the project will serve as a pilot project that will define the future of wood construction. As Haapio (2013) concluded in his study, the threats for the future of wood construction industry are the

[2] **LVL:** Laminated veneer lumber (LVL) is a construction element that is made by bonding 3mm thick veneers into solid wood elements. LVL as a construction element offers an exceptionally strong material relative to its weight, which is the key benefit of the product. LVL as a construction material is new in the market of solid wood construction and it is currently produced by Stora Enso factory in Varkaus in Finland where the elements are shipped to the Wood City construction site. (Stora Enso Building and Living n.d.b)

fear of failure and lack of know-how. Therefore, if and when the Wood City project succeeds, it increases the know-how in Finland and it could encourage the use of wood as a construction material in the future. In other words, since the project is the largest in its category, its importance for the future of wood construction cannot be emphasised too much.

The site is located in downtown Helsinki and it is a well-known construction project which affected the example selection. In addition, the international context provided by the backgrounds of the companies increased the attractiveness to choose the Wood City project as an example to this study. It should be mentioned as well that the researcher works in a supplier role in the construction industry and during that time has followed the Wood City project closely. Therefore, in addition to the reasons mentioned above, the personal interests of the researcher affected the example selection.

4.2 Subcontractor selection criteria

The following criteria are based on the model of Nasab and Ghamsarian (2015) and the objective is to discuss each criterion in the model individually. Through this discussion, an in-depth analysis of each criterion is formed which helps to understand how the criteria were evaluated and used in this example case. In addition, the importance of each criterion is defined.

4.2.1 Financial stability

When discussing the financial stability as a selection criteria, the interviewee mentions the basic processes that relate to the analysis of the financial state of a business partner. To elaborate this, there do exist certain indicators and processes that are followed when something, either services or products, are being purchased. In this case for instance, Stora Enso purchased the construction and assembling services from Woodcon.

In this example case, one of the main indicators of the financial stability of Woodcon was that they were able to give Stora Enso a contract rate which simply means that Woodcon will bill Stora Enso based on the completion of the project defined in their contract. In other words, they will not bill any hourly work but only the completed project or part of is paid by Stora Enso based on the performance. Given the nature of the project in terms of size and technical requirements, the fact that a subcontractor is able to give a contract rate offer is crucial: “They do it (the project) purely based on the contract rate and that is basically the main demand considering the financial stability. Surely, it has to

be evaluated in each case whether the subcontractor understands the risks so that they do not just send an offer and hope for the best"

In this case, the earlier experience and relationship between these two companies showed that Woodcon understood these described risks and that their offer on the project was valid. It can be concluded that the eagerness of Woodcon to join a project which is rather demanding financially and technically combined with the ability to provide a contract rate indicated that Woodcon is a financially stable partner.

The credit rating of Woodcon was not evaluated or checked since Woodcon is a familiar company for Stora Enso. In addition, the payments and billing is purely based on performance which made investigating credit rating unnecessary simply because there is no need for any credit based transfers.

When asked about any other indicators of financial stability such as financial statements or balance sheets, they did not raise any interest. Also, no auditing processes were done to Woodcon. This was explained by the successful history in other projects, which indicate that there was no reason for closer investigation in this case. Although the interviewee points out that since the cooperative history of Stora Enso and Woodcon is long, it is possible that closer financial investigation or auditing has been done at some point in the early phases of the business relation.

In terms of financing the products on site, Stora Enso is responsible for the elements and Woodcon for the other equipment. Although the importance of a subcontractor's ability to finance its own equipment was not emphasised, it should be mentioned. The interviewee argued that the sum of onsite equipment and products are considered to be small compared to the price of the deal, which is why the subcontractor's ability to finance its own equipment was not given much emphasis.

The importance of financial stability as a criterion is marked as highly important. The worst-case scenario related to a potentially poor financial stability is bankruptcy of a subcontractor, which is noted by the interviewee: "In this type of project the bankruptcy of a contractor is a complete catastrophe. In that sense, we have to be prepared for a scenario where a contractor potentially goes out of business. It has to be prepared for or at least it has to be acknowledged as a risk."

Another important reason of why financial stability is evaluated is since it secures continuity of the business and the operational capability. This reflects, for instance, to the salary payments and the payments for the suppliers. Especially the ability to pay salaries correctly and on time was emphasised since it secures that the employees of the subcontractor will not stop working during the project. Here lies the importance of the evaluation of financial stability as a selection criterion: if the financial stability of a subcontractor is proven, it is most likely that the subcontractor is able to pay for the salaries and other purchases. This continuity of the business operations assures that the subcontractor is able to fulfil the requirements and tasks assigned to it.

In this case, there were no real risks or problems related financial stability. The evaluation was not that thorough since the past relationship gave no reason for deep evaluation of financial stability: “Let’s put it this way. We have done the evaluation by scaling the size of the project to the size of the contractor and based on that they will not have any problems. And also since we know them and their background and they are our customer, we have not done any large scale evaluations whatsoever.”

In terms of financial stability as a selection criteria, the nature of the project and the earlier business relations had a significant effect on the evaluation process of this specific criterion. Since the project showed technical challenge, the ability and willingness of Woodcon to provide a contract rate for the project proved that they understand the risks and that they are a financially stable subcontractor for this project. In addition, since Stora Enso serves Woodocn as a material supplier, there was no incentive to run any deeper credit rating or other financial analyses. The earlier business relation combined with the contract rate offer indicated Stora Enso that Woodcon is a financially stable subcontractor.

4.2.2 Experience

The experience was noted by far as one of the most important and meaningful criterion when choosing Woodcon. This relates closely to the nature of the project and how it is a pilot project in Finland. The project uses LVL as a construction material and there are only a few contractors who have experience on that type of construction work. In addition, these few that have the experience are located in the US or in Asia. That is why it is extremely important that the contractor has general experience on solid wood construction, despite the fact that Wood City is the first project where Woodcon uses LVL as construction material: “This project is, in terms of LVL, first of its kind for Woodcon. This is because the LVL is a new product and the production of it only began recently. Despite this, the management of Woodcon has a background of around twenty years in CLT construction.”

At this point, the question concerning the LVL and CLT element types were raised. According to the interviewee, Woodcon has sufficient experience on CLT, but not from LVL since LVL is a completely new type of an element. Essentially, the concern was whether the CLT experience is a sign of sufficient knowledge in the use of LVL elements as well. The interview explained this by elaborating the key differences of the element types and that the construction technique used in CLT elements is transferable to the construction process with LVL. The experience on CLT was considered as a sufficient indicator of Woodcon’s knowledge due to the similarity of LVL and CLT in the construction phase: “Even though the elements are different, they are both solid wood

elements which means that the assembling process is very similar to the one that they (Woodcon) have used in CLT construction. The material is different and the elements are slightly different, but otherwise they have quite much in common. It could be said that the CLT construction experience in this case is practically and directly transferrable to LVL construction."

Clearly Woodcon has experience in this field and from a long period of time, which had a lot of weight as a criterion. The interviewee emphasises this criteria as soon as it was asked that how the experience of the organisation and employees affected the selection: "Well, without a doubt experience was one of the most important and crucial criterion. They (Woodcon) have an extremely strong background and experience from solid wood construction and also they have been acquainted with similar construction systems than we used in this project. In addition, Woodcon has experience from large scale solid wood construction projects, even monetarily larger projects than Wood City is. Hence, the experience as a criterion weighed a lot."

Since the project is conducted on Finnish soil the experience in the area raised a lot of questions in the selection phase. Since the contractor is Norwegian with no prior experience in Finland there were a few concerns and minor problems: "Obviously a lot of things come along like language barriers and cultural differences. Even though we are within the Nordic countries there are certain cultural differences and we recognised in the very beginning of the selection process that we would face these types of problems. On the other hand, it is just basic kind of normal organisational learning when we talk about the main contractor on-site, Woodcon, us and other parties involved. The group will learn how to function when given enough time."

Due to this organisational learning process, the interviewee said that these problems related to the new environment and new country were not a minus or a barrier to the contract. Even though there have been some problems, they have been solved. The key is to evaluate and acknowledge the problems so that when they occur, they can be solved quickly and they do not come as a surprise. The interviewee confirms that there have been a few problems and most likely will be in the future related to the cultural differences. This serves as an important case in point about how the evaluation process of experience should take into account the experience, or the lack of it, in a specific geographical area.

Another issue related to regional experience relates to the laws and regulations of different countries. However, in this example, these problems were minimal and apparently there exists only one difference in the onsite regulations and laws. In that sense, when evaluating the regional experience, the issues in the different legislations across countries did not come across. When asked about the possible differences in legislation and regulations they did not raise any concern: "I'd say that the differences are seen more in the cultural aspects rather than in legislation or regulations. For instance, in the process of agreeing on the limits and tasks of each party the cultural differences stood

up. In general, Finland and Norway, and Sweden as well, are really close to each other in terms of onsite regulation."

On the other hand, as the interviewee points out, problems might occur when dealing with subcontractors from Baltic countries. In this example, however, the lack of experience in the area only relates to the cultural aspects, but not as a negative criterion as described above; despite the minor disputes.

Experience from a certain type of a project was raised as an extremely important aspect by the interviewee. When selecting Woodcon, it was pointed out that Woodcon as a company and its CEO as an individual professional have 20 years of experience in construction work using CLT elements. In addition, the scale of Woodcon's earlier projects has been even larger than the Wood City project. It was evaluated that Woodcon will not have problems in terms of handling the project size since they have also faced larger projects in their history.

It should be mentioned and emphasised that Woodcon has profiled itself especially in the field of solid wood construction which was a crucial criterion in the evaluation phase as well. Their experience is almost completely from the field of solid wood construction and the experience on those projects is outstanding in the market. The reputation that Woodcon has in Norway is exceptionally good and the company is well-known for its solid wood construction projects in Norway. Without a doubt, this experience, business focus and the reputation acted as supportive aspects in the selection process of Woodcon.

4.2.3 Past performance

When the past performance was evaluated, most of the focus was placed on the assembling speed that Woodcon has established during their earlier projects. They have clearly shown that they are able to conduct fast paced project execution. This was noted as the most important aspect when it comes to past performance: "Definitely the assembling speed was one of the most important aspects of past performance that was evaluated. They had sufficient proof that they are capable of fast assembling of the elements onsite. This is extremely important since the most crucial advantage of solid wood construction is that the construction speed can be really fast. On the other hand, the assembling speed can be only as fast as the workers assembling the element. Woodcon has developed their methods during their experience in different projects and this enables the fast assembling speed."

In the past, Woodcon has not had any past failures that would have come across as a negative indication. It was noted that every construction company has had their better and worse projects but there were not abnormalities considering Woodcon: "There have not been any real failures in the past of Woodcon. But, of course, and by the way this accounts

for majority of construction companies in general, there have been some projects that have been more successful than the others."

Relating to the past performance, Stora Enso did not consult any third parties in terms of references and Woodcon itself did not give any references either. This was explained simply by the fact that Stora Enso and Woodcon have a common history from Norway, which was considered as sufficient indicator of the past performance. The joint projects that they have conducted together have provided Stora Enso with information on the aspects considered important, such as the fast-paced project execution.

An interesting point is that when the Wood City project was about to start, the Finnish project lead went to Norway to see the projects of Woodcon and how they perform onsite. In that sense, the past performance criteria were evaluated in advance before the actual selection phase and even before the actual negotiations started. It is also notable how the actual onsite visit done by the project lead was used when evaluating the onsite performance of Woodcon: "We did not really have any incentive to consult other parties on past performance since we know Woodcon so well. For instance, I have been to Norway myself on their construction sites to visit them and to see their earlier projects. This was done before the Wood City project started."

The interviewee adds that despite the fact that his organisation did not seek for any references from other parties they were aware of the general reputation that Woodcon had in Norway: "We know the market in Norway quite well and we can say based on our knowledge that Woodcon is a very well-known and highly respected contractor there in the solid wood construction segment."

In conclusion, the past performance as a criterion was evaluated based on the earlier projects in Norway and by visiting the sites there. In addition, the earlier business relation in Norway acted as a sufficient proof that Woodcon is capable of successful solid wood construction with exceptional assembling speed. Moreover, the reputation of Woodcon in Norway acted as a supportive reference when evaluating past performance. The importance of past performance as a criterion was evaluated high especially in terms of the assembling speed since keeping up with the project schedule is highly appreciated in the Wood City project.

4.2.4 Technical capacity

The technical capacity as a criterion was controversial. When considering this criterion, it is important to be aware of whether it is defined as technical capacity in terms of planning and engineering or in terms of technical capacity on site.

The technical capacity regarding engineering capability and planning was not related to this case since all of that was done by other parties involved. The interviewee points

out that the importance would be greater if the project would involve planning of some sort: “Technical capacity in this case did not play any role since we were and are completely responsible for the planning. If this project would require planning capability from a subcontractor then this criteria would matter much more.”

In this case Woodcon only took care of the onsite assembling which makes the technical capacity in one sense an obsolete criterion. The subcontractor in this case was not required to execute any planning whatsoever and hence the technical capacity was not considered as a valid selection criterion.

On the other hand, the technical capacity relates closely to the past experience and performance in terms of the onsite execution. Woodcon is highly acquainted with this type of construction method and they have developed an efficient way of working which may be qualified as technical capacity in that sense. According to the interviewee, the technical capacity in most parts did not relate to this example since the construction work they conduct is quite simple once there is developed experience on the matter. The key is the experience and past performance, which in this example have provided all the necessary technical knowhow for Woodcon. The interviewee states that the technical capacity is related to the assembling: “Much of this criterion relates to the past performance and experience in my opinion. All in all, this assembling they do onsite is relatively simple and easy to do once one has the knowledge and experience. There is no complicated methods or such related to it. The key is that the contractor knows, for instance, how the wood behaves and what fastening system should be used. In other words, this project requires experience-based technical capacity.”

Although the technical capacity in this case was not evaluated as a crucial criterion, the interviewee raised an important point relating to the evaluation of technical capacity. The point was that in a situation where the technical capacity would be evaluated in terms of planning capability the cultural and national differences should be taken into account. For instance, in this case, Woodcon had experience and knowledge of the planning of solid wood construction but that experience was gained in Norway, which could have led to problems if Woodcon were required to conduct the planning for the project in Finland: “When talking generally about construction planning in Norway and in Finland some differences exist. It is fair to say that in Norway the general experience in solid wood construction planning is more advanced than in Finland. On the other hand, in Finland the party responsible for planning has to provide much more information upon the project than in Norway. In a speculative scenario where Woodcon were responsible for the planning, there could have been problems related to proving the plans.”

In conclusion, due to the nature of the project, technical capacity was not important and it was not really evaluated in the selection process. Since in this example case the subcontractor was not required to do any planning or technically challenging engineering the validity of technical capacity in this example was questionable. On the other hand, the

interview raised an important point relating to the importance of proper evaluation of technical capacity when it comes to international subcontracting since differences in the regulation and norms exist related to planning in different countries. In other words, planning and technical experience in one country is not proof that the subcontractor would be able to conduct proper planning in another country. That is a potential pitfall scenario where the plans of foreign contractor are not transferrable to the project due to cultural and regulatory differences. In addition, it should be noted that this criterion relates closely to the experience and past performance. The interviewee mentioned "experience-based technical capacity" meaning that even though the technical capacity was not evaluated that much as its own criterion the indicators of technical capacity were evaluated based on the experience and past performance of Woodcon.

4.2.5 Resources

Resource-wise the international context had a significant impact on this criterion. In general, the resource based question of the organisation's relocation possibility was raised. A discussion between Stora Enso and Woodcon was established in the early phases since the concern was about how the resources of Woodcon, especially in terms of staff, can be organised to Finland: "When it comes to the resources the main thing was to organise the practicalities. We started the conversations on this matter very early. We know that they were not able to send their whole team to Finland and keep them here during the whole project. In addition to this, we had to think about the language barriers and how that affects the operations onsite."

Resources as criterion was in this example evaluated in-depth since there was a need for reorganising due to the physical distance between Finland and Norway. In addition, Woodcon did not have any staff or organisation in Finland. The problem was discussed in collaboration and eventually the problem was solved by providing Woodcon with their own subcontractor. During the project, Woodcon only uses Norwegian project leads and 30% of the assembling employees. The rest of the employees come from the Finnish contractor that works as a subcontractor for Woodcon.

In the process of selecting the subcontractor for Woodcon, Stora Enso used their connections in Finland and they also knew this contractor beforehand. This is an important aspect to take into account since, in international subcontracting, the resource allocation might become a problem where need for help from the domestic party might arise. Criterion-wise this resource question in long distance contracts should be raised since there might be a hidden cost factor and increased workload for the client, in this case Stora Enso, although in this example this did not have any negative effects. This was because it was Stora Enso's first intention to get Woodcon's knowledge to Finland: "Our

goal was from the beginning to combine the elements. I mean that we wanted to have the knowledge and knowhow from Norway and then reinforce that with Finnish work force."

It is fair to argue that resources as a selection criterion was the one that the international context seemed to affect the most. Since the subcontractor and the construction site were in different countries, Stora Enso had to re-evaluate the resources. Due to the distance, the resources in terms of labour and machinery were not transferrable to the construction site in Finland. On the other hand, since the goal of Stora Enso was to gain the knowledge and know-how of Woodcon, this was not an obstacle in the end. In that sense, resources as a criterion was evaluated based on the objective. Hence, the long distance did not have a negative effect in the selection process.

4.2.6 Quality and safety

For Stora Enso, the safety aspects are the most important factors generally in their construction projects. The interviewee emphasises the importance of safety: "It is our principle at Stora Enso that safety always comes first. It is actually the number one thing onsite. That is something which is not negotiable. It has to be the number one priority for everyone and every party involved in a project."

After that becomes quality since Wood City as a pilot project will affect the use of solid wood as a construction material in the future. The interviewee states that in this project, they are willing to increase the project time if it secures the quality of the end result: "In this project, quality is the one that comes after safety. It overrules everything in this project. By that statement I mean that the quality is even more important than our schedule and budget. We are prototyping new construction material and our supply chain hence there is no room for errors in terms of quality."

To understand the importance of quality, it should be taken into account that the project serves as a pilot project in many ways. The construction material is completely new, the construction process is conducted completely without weather covers and as a project it has gained tremendous publicity: "The quality is the number one thing purely because this project is a pilot project in Finland. It has to be understood that in this project we are building with a completely new material and method where no weather covering is used during the construction. This means that many parties, such as construction regulators, government officials and general crowd, are interested on this project. That is why we have to be able to proof that we provide high quality constructing."

Due to these reasons, it is important for the project to go as planned. A poor quality in this project may lead to a series of consequences that have a negative effect on the reputation of CLT and LVL elements which is an issue that Stora Enso avoids.

When selecting Woodcon, this criterion of quality was addressed and it was also highly interlinked with experience and past performance: “It has to be mentioned and emphasised that Woodcon went through the same piloting process back in Norway when they started constructing with solid wood elements. They have experience in piloting and experience in quality assuring when it comes to solid wood construction. I would say that in that sense, the quality as criterion in this case related very much to the experience of Woodcon.”

Woodcon was able to show the required quality for Stora Enso through past projects. In addition, they have a quality assurance process through which they are able to continuously report the quality onsite in the Wood City project. Stora Enso is able to follow the quality continuously and according to the interviewee, quality reporting is something that is considered obligatory from a subcontractor.

On the safety side, the legalities onsite are almost identical between Finland and Norway, which was the first indicator for Stora Enso that Woodcon is a contractor that is able to follow the safety procedures. In addition, in the selection phase the issue was discussed in-depth in order to keep everyone on the same page. The almost identical onsite safety regulations between the two countries made it unnecessary for Stora Enso to conduct a more in-depth analysis considering safety as a selection criterion.

4.3 A summary of the main findings of the empirical study

When considering the main findings, the first one is to point out with great emphasis the technical requirements of the project and that it serves as a pilot project in the field of solid wood construction in Finland. Due to these reasons, the selection of a subcontractor was not a traditional selection process in terms of the number of possible candidates. The interview pointed out numerously that in the selection phase, there were only three potential candidates for Stora Enso to accompany with. The technical requirements, use of new type of element and the size of the project reduced the number of potential subcontractors to only three. The interviewee indicated clearly that this number is smaller than usual: “Basically, in this kind of a pilot project there is potentially, in some cases, only one candidate to choose from, if even that. We talk about a very small pool of candidates that we have to choose from. Sometimes we just have to state that we do not have a choice.”

The pilot project nature and the lack of potential candidates makes it extremely hard to use a pre-determined set of selection criteria. This is simply because the use of criteria in prequalification may lead to a situation where there are no candidates left. In this case, the initial search for a candidate was done by going through the networks of Stora Enso

without setting up any criteria model. It can be stated that the validity of criteria models presented in the theoretical review is controversial. The interviewee stated clearly that these types of criteria models are only valid when there is a vast or even unlimited pool of potential candidates, which makes the model in this case not applicable.

Nevertheless, each criterion was still evaluated and used to an extent. The interviewee found some elements under each criterion that were evaluated in the case of selecting Woodcon. In that sense, the criteria were valid and used throughout the selection process. It was elaborated by the interviewee that the criteria were used in making sure that everything goes as planned onsite during the project, but the actual selection was based on only a few reasons.

These reasons for selection were past performance, experience and proven quality of previous work. The experience that Woodcon had from solid wood construction was the main criteria and subsequently affected the use of other criteria as well. The experience is directly related to the past performance, which provided Stora Enso with all the necessary information needed. Critical information relating to past performance included proof that Woodcon has been able to handle the project specific requirements in terms of installation and project size. The installation speed has been exceptional and in the past projects Woodcon has been successful. It should be noted that the contract rate that Woodcon was able to offer for Stora Enso in this project was also one of the main criteria.

The only minor issues that Stora Enso came across in the selection phase related to the resources and past performance in terms of regional experience. As a Norwegian company, Woodcon did not have any organisation in Finland and it had to be organised with the help of Stora Enso. In addition, the lack of experience in Finland created cultural and language barriers which can be considered minor issues in the selection phase. Furthermore, the interviewee indicated strongly that the organisational learning would mitigate these obstacles. Despite these obstacles relating to the international context Stora Enso wanted to use Woodcon due to their strong experience that could benefit the Finnish market of solid wood construction.

In conclusion, the pilot nature of this project made the use of any specific criteria model inapplicable. The key criteria consisted of the past experience and performance of Woodcon. In addition, the long cooperative history between Stora Enso and Woodcon played a significant role since their prior cooperation facilitated the evaluation of certain criteria and even allowed for the elimination of informative in-depth analysis of certain criteria. For instance, evaluation of financial stability or the past performance and experience was simply done by evaluating the prior cooperation. This is one of the key findings, indicating that if the subcontractor and client have prior cooperation, this can be used as the predominant tool in the criteria evaluation. In addition, since the prior cooperation was considered extremely important, it can be argued that such a business relationship serves as a selection criterion.

However, since the relationship is not a characteristic of the subcontractor, it should be considered as a moderating factor that affects the application of other selection criteria. In this example case, this factor had a positive effect on each criterion due to the fact that the relationship and cooperation between Stora Enso and Woodcon had been successful.

5 CONCLUSION

In this chapter, the main findings and outcomes of the study are discussed. The conclusions are divided in the three subchapters. First, the theoretical discussion focuses on the theoretical aspects of the study and how the empirical findings relate to the earlier studies on the topic. Secondly, the managerial implications are addressed in order to provide takeaways from the study to real life cases in the field of international business. Thirdly, the limitations that this study had, in terms of the example case as well as the methodology, are discussed. Finally, suggestions for further research are discussed and the research gaps are addressed.

5.1 Theoretical discussion

When discussing the emphasis of each criteria, the nature of the example case should be taken into account, as well as the fact that there is a heavy emphasis on relationships, past performance and experience. On the other hand, this is not a universally applicable result simply because in each project the emphasis on different criteria vary depending on the project specific factors (Hartmann et al. 2009).

To elaborate the findings of this study, in line with Hartmann et al. (2009), the importance of specific criteria is relative. Since the case example of this study had a few specific characteristics, the criteria of subcontracting selection are relative as well. Especially the nature of the project as a pilot project with the new type of wooden construction elements clearly affects the emphasis that was placed on specific criteria.

In addition, the technically unique construction method makes the selection process different compared to a typical construction project. What is meant by this is that since the example case acted as a pilot project in Finland and the construction methods required specific technical knowledge from the subcontractor, the selection criteria were unique as well. Stora Enso had to evaluate the criteria more as a complete set rather than as individual criterion. In addition, due to the above-mentioned project specific requirements, there was a substantially low number of potential subcontractors for this project. This was also one of the reasons why Stora Enso emphasised the earlier relationship, past performance and quality and did not evaluate multiple criteria in depth which could have been, according to the interviewee, the case had there been more candidates.

The prior business relationship between the parties was proven to be extremely important and that is in line with the literature (Jennings & Holt 1998). On the other hand, the theoretical framework and the model did not address prior business relationship as a selection criteria. It can be stated, however, that the prior relationship should not be used

or considered as a selection criteria itself, but it still plays a big role on how the selection criteria are evaluated. Positive prior experience makes the evaluation and use of selection criteria more straightforward but the prior experience alone should not determine the subcontractor selection.

The international aspect affected especially the evaluation of resources and experience. When the experience was evaluated the main contractor had to take into account the subcontractor's local experience and the experience of local safety regulations. This follows the findings of Mbachu (2008). In the case of this study, though, the subcontractor was from Norway which means that the regulatory and climate differences compared to Finland were not crucial but that is something to consider in future studies related to international subcontracting.

Another aspect of the international setting relates to the evaluation of resources in terms of the available work force (Doloi 2009; Watt et al. 2010). Stora Enso had to make new resource allocations due to the physical distance: Woodcon was not able to provide all the labour necessary from Norway. This is an extremely important aspect of the evaluation of resources as a criterion in an international subcontracting setting.

Going back to the theoretical framework and model of Nasab and Ghamsarian (2015), the empirical evidence proved to be quite interesting and even controversial. In other words, even though the criteria itself were identified as relevant and important by the interviewee, it was surprising how the evaluation and selection process proceeded. There was no in-depth evaluation of each criterion since the prior business relation had confirmed all the necessary information needed for the selection. The experience, past performance and quality among the safety onsite were emphasised in the selection the most and all of these criteria were analysed based on the prior business relation. In fact, the only criteria that Stora Enso had to evaluate more carefully were the resources and experience in terms of the cultural setting since the project was in Finland which made it difficult for Woodcon to use their work force. Moreover, the multicultural construction site presented a minor challenge. In conclusion, the extensive prior business relation between Stora Enso and Woodcon made it unnecessary to use multiple criteria evaluation and conduct an in-depth selection process even though the project presented and international aspect in terms of location and other aspects such as regulatory and cultural differences.

Adjustments should be made to the quality and safety criterion as well. Based on the literature review and empirical research, quality and safety should be discussed separately as their own criterion. Their nature as criteria differ and have different dimensions in the evaluation process, hence it seems inconvenient to handle them as an entity rather than quality and safety as separate constructs.

These findings can be explained by the unique setting of the case in this study. As described, the construction site is a pilot project in Finland in LVL and CLT construction

and this affected the emphasised criteria. Stora Enso focused on the quality and past performance which were proven by the prior business relation of the two parties. Due to the pilot project nature, the most important criteria for Stora Enso where the ones that enable a fully successful project in terms of the quality of the end result. This finding supports the findings of Doloi (2009), Hartmann et al. (2009) and Hatush and Skitmore (1997b) which state that there are not universal selection criteria and that the emphasis depends on the setting and the characteristics of the project at hand. In addition, the trade-offs mentioned by Hartmann et al. (2009) were proven empirically since the interviewee mentioned that quality would overrule on-time delivery if necessary.

5.2 Managerial recommendations

The results of this study provide many takeaways and recommendations for selection criteria and international subcontracting. In this subchapter, the main managerial recommendations and the business value are presented based on the findings of this study. These recommendations should provide important insight for dealing with subcontractor selection processes in an international context.

First of all, the criteria that were discussed in this study provide an important result. The criteria which were used as the theoretical framework proved relevant and indicate that in subcontractor selection multiple criteria should be evaluated. On the other hand, the selection should focus more on evaluating the criteria as a complete entity and how that matches the requirements of a project.

When talking about the most important criteria out of the ones that were under investigation, there were a few that showed substantial importance. Past performance, experience and the proven quality showed the most importance in this selection process. The importance of these criteria relates to the project specific conditions. Since the project had a pilot project nature to it, the past performance, experience and quality were emphasised. This indicates that in projects that have challenging requirements and where there is a new type of construction method used for instance, certain criteria are emphasised.

In fact, the project specific characteristics and how they relate to the selection criteria is one of the most crucial recommendations of this study. In subcontracting selection, the used criteria should always be related to the characteristics of the project. For instance, if the project has challenging technical requirements, the criteria should relate to that. In other words, when using multiple criteria in subcontractor selection, the emphasis on specific criteria should relate to the project specific characteristics and requirements.

As discussed in the findings, the prior business relationship that the contractor and the subcontractor had in the example case had a significant effect on the selection process. It

seemed to moderate the use of selection criteria and in effect made it unnecessary to conduct an in-depth analysis on each criterion. For instance, financial stability and past performance were evaluated through the prior business relation rather than through other evaluation methods. This indicates that contractors should focus on developing long lasting relationships with their subcontractors. The process of subcontractor selection can be substantially more fluent compared to a situation where the parties are unknown to each other. A strong relationship can also ensure the quality and performance better than other evaluation methods since there is concrete experience from previous projects. Successful cooperation in previous projects can be easily evaluated as a positive factor when evaluating the selection criteria. Business relations should be encouraged and established since it provides a trustworthy and effective tool that helps the evaluation of the subcontractor selection criteria.

The international aspect of the study provides important recommendations related to international subcontracting. First of all, it should be taken into account that international subcontracting should be seen as a possibility among domestic subcontracting. This might seem as a secondary option especially in the construction industry since it requires physical presence of the staff. On the other hand, the characteristics of a specific project may require international subcontracting. The evidence of this study indicates that international subcontracting in some cases should be seen as a possibility but if that should happen, certain criteria should be re-evaluated. For instance, in terms of the resources, for the subcontractor working abroad it means organising the existing staff abroad or acquiring new work force from the country where the project is located. This organising may require the help of the main contractor and hence should be paid attention to. Another aspect relates to the cultural differences and the potential disputes arising from them. So even though international subcontracting should be seen as a viable possibility, there are aspects to it that may require re-evaluation of selection criteria.

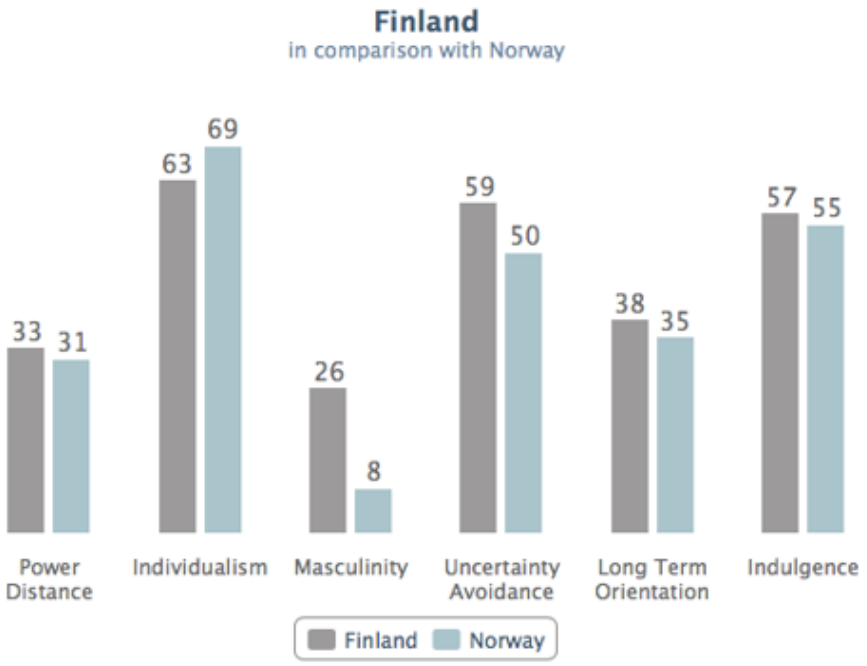
As the contractor selection and use of selection criteria are processes done primarily by humans, the chance of human error should be addressed. There are numerous ways of how errors can occur. For instance, the personal preferences and biases of people may affect the selection process and how the selection criteria are used. The preferences of people vary which means that different people may emphasise different criteria. The indication of this is that in order to avoid human error in subcontractor selection several professionals should be consulted. Preventing personal preferences and errors in the selection processes can be a difficult task but consulting as many persons as possible could reduce the chance of personal bias or preference influencing the decisions.

5.3 Limitations of the study

As studies in general do, this study has its limitations as well. First of all, the example is unique in terms of its characteristics, which makes the transferability of this study difficult. Establishing a general set of criteria through this study is almost impossible since the nature of the project and the background of the parties involved were special and difficult to imitate. In other words, this study represents an insight into only one example case where the criteria were used uniquely.

Moreover, there are regional and cultural limitations as well. The Norwegian-Finnish setting only serves as one example in the international context. Since the presented case had only two nationalities under investigation, the international aspect and results related to that are somewhat limited. These two countries have relatively similar laws and norms in terms of construction so the extent of cultural implications are limited in that sense. In Figure 7 it is evident that when comparing Finland to Norway the cultural dimensions of Hofstede are relatively close in values. Hence, the international limitation in terms of the background of the companies should be taken into account when interpreting the results. For instance, in Arabic countries the use of criteria and their emphasis might be different from this case.

Figure 7 Comparison of Hofstede's cultural dimensions of Finland and Norway



Source: Hofstede (2017)

In addition, this thesis only presented one example case among potentially thousands of different subcontractor selection processes. Therefore, making a conclusion of the use of specific criteria and their importance only concerns this case. A more in-depth

understanding about the general selection criteria would require an investigation of several cases through the use of cross-case analysis for instance.

A crucial part of the limitations is the special characteristics of the example case. The case was a pilot project in Finland and this pilot nature of the project clearly affects the outcomes of the study. It can be stated that the results presented only relate to a case where the technical requirements are above an average construction project. The study results are limited into a scenario where the construction project has a pilot nature to it and where the number of potential subcontractors is small to begin with due to the technical requirements.

In addition to the project being a pilot one, it was still unfinished at the time of finalisation of this thesis. Due to the ongoing construction of Wood City, this thesis cannot consider the success of the project, and furthermore, the link that may exist between the subcontractor selection criteria and the eventual outcome of the project.

Another aspect that should be mentioned as a limitation is the long business relationship that the Stora Enso had with Woodcon. Stora Enso had been executing multiple construction projects with Woodcon prior to the case that was under investigation in this thesis. The earlier successful business relationship was proven to be a significant factor in the selection process in the empirical study. This acts as a major limitation since the results are strongly affected by the positive business relation that the contractor and subcontractor have. In a situation where the contractor and subcontractor had a negative history or no history at all, the results would most likely differentiate from this thesis.

Personal bias and preferences should also be taken into account when discussing the limitations of this thesis. The interviewee was the one responsible for the selection and there is a chance that the personal preferences affected the selection process. This does not mean that the quality of the decision making is jeopardised but that the personal preferences may have affected the selection process. As NG et al. (1999) stated, there exist different preferences between professionals in different fields. That is a potential limitation of this thesis since no other key personnel or professionals were consulted.

It can be stated that the business relation and the supplier chain in the Wood City project is not a traditional one. In a traditional supplier chain in a construction site there exists a main contractor that uses subcontractors in the various different tasks onsite. However, in this example case, the subcontractor Woodcon serves as a subcontractor for Stora Enso which is not the main contractor onsite. Stora Enso is the supplier of material for the Wood City project but Woodcon is their subcontractor onsite. They both are customers to each other; Woodcon as subcontractor to Stora Enso and Stora Enso as a material supplier for Woodcon. The main contractor onsite is SRV and it does not have any contractual relation to Woodcon.

This unusual setting is definitely one of the limitations of this study. The main contractor onsite that takes care of the day-to-day construction operations was consulted on the selection of Woodcon but the actual decision of selecting Woodcon was made by Stora Enso which is the supplier of the wooden materials. In other words, the limitation of this is that since Stora Enso is both a customer and a supplier for Woodcon it is most likely that this unusual setting affected the subcontractor selection process. This unusual relationship also limits the empirical findings to this specific setting. It is possible that in a more traditional setting where the subcontractor is selected by the main contractor onsite, the main contractor would emphasise different criteria in the selection process. The uniqueness of this example case acts as a crucial limitation and hence the generalisation of the results is questionable.

5.4 Suggestions for further research

As seen from the limitations, there are a number of suggestions for further research. This research focusing on one example provided some important results related to the selection criteria in international subcontracting but still there are a number of questions that further research should focus on. The suggestions for further research relate to the limitations of this study which indicated some of the research gaps related to this thesis.

First of all, the regional and cultural effect should be paid more attention to. There should be more research on how the culture affects the selection process and selection criteria. For instance, are some criteria evaluated more deeply and considered more important when a certain cultural aspect changes? Further research should aim to find a connection between specific cultural characteristics and differences that affect the use of selection criteria in subcontracting processes. The international aspect in this case had an effect on specific criteria – such as resources – but more cases should be evaluated in order to find out how international aspects affect the use of selection criteria.

In addition, the study only provided one example case that was investigated. Hence, in order to get a more in-depth understanding on the selection criteria in subcontracting, further research should focus on analysing more cases and in different fields and backgrounds. For instance, a quantitative approach among contractors that use specific criteria in subcontractor selection could provide more insight on the criteria in general. For instance, which criteria are valid and which are the most crucial ones. On the other hand, these types of studies have already been conducted but since the industry is continuously changing, the criteria need updating. Therefore, there exists a research gap for more quantitative studies concerning the selection criteria.

The project specific characteristics in this study address several research suggestions for the future studies. The crucial effect of the prior business relation between the

contractor and subcontractor to the selection process reveals an important research gap. The future research should definitely pay attention on how the prior business relationship affects the subcontractor selection and the criteria that is used in the process. This should be done from different approaches as well. For example, it should be investigated how a positive relationship affects the selection criteria and on the contrary, what kind of an effect a negative relation has. Moreover, it is important to take into account cases where the parties, contractor and subcontractor, are completely unknown to each other prior to the selection process. This should provide important results on the role of the prior business relation and how it moderates the selection criteria and selection processes.

In addition, the example case in this study differs from the majority of projects – at least in the Finnish environment. That being said, more research should be conducted among different cases and different construction methods. For instance, how the technical requirements of a project affect the selection criteria and how a specific method, such as the solid wood elements in this study, affect the selection criteria. The research should focus on the background factors and how the project specific conditions relate to the subcontractor selection criteria. Obviously there exists a number of background factors that can be researched but in order to develop a deeper understanding on the subcontractor selection criteria, more research with diverse cases should be conducted in the future.

The incompleteness of Wood City's construction meant that any links that may exist between subcontractor selection and the success of the project could not be considered. Correlation between the constructs is likely to occur and the causality of different subcontractor selection criteria and different outcomes in construction projects provides an interesting and important research direction.

The empirical research in this study was gathered from one person and that exposes the results for personal preferences and bias. Future research should tackle the research gap related to the personal preferences of the personnel that are responsible for the subcontractor selection. Further research questions could be first of all, how do the personal experience and preferences alter the selection criteria and secondly, is there a way to limit the personal bias in selection processes? Based on this study, it is difficult to evaluate how the personal experiences affected the use of selection criteria and if it acted as a negative or a positive factor. That provides an interesting research gap for the future.

In addition, the unusual setting of the project should be taken into account. In terms of future research, it should be examined more how the different supply chain setting possibly alters the evaluation processes and importance of different selection criteria. For instance, in the context of this study, it could have been investigated how the main contractor SRV chose its subcontractors and how they have done their analyses in the subcontractor selection processes. In other words, different hierarchies exist in construction sites and there are numerous amounts of different subcontractor relations.

How the business relation possibly alters the subcontractor selection and the criteria that are used in the selection should be examined more.

Since the construction industry is changing alongside with the society and world in general there are a number of interesting themes in this field as well. A case in point is digitalisation and automatisation. There is an increasing amount of automised analytical tools that could be responsible for the subcontractor selection processes in the future and that could be a theme for further research. For instance, can automised tools be responsible for subcontractor selection without any human error and bias? Another theme is the development of new selection criteria. Some criteria can be considered to be timeless and probably valid in the future as well but there could be room for completely new criteria when the industry changes. This is for sure something that the future research should address.

6 SUMMARY

In this study the selection criteria related to international subcontracting and subcontractor selection were analysed. The analysis was done with an example case through which the objective was to analyse what criteria Stora Enso used when choosing Woodcon Ltd. as their subcontractor in the Wood City construction project, using the criteria model of Nasab and Ghamsarian (2015).

The aim of this was to provide more in-depth information of the subcontracting process in terms of selection criteria. Since the subcontracting is an essential part of the construction industry as well as the supply chains in construction sites, this study was of importance for the industry. In addition, since the study was done in the field of international business, the example selected for the study presented an international dimension as well. Therefore, this study provides a more in-depth understanding of how the international aspect in subcontracting affects the use of selection criteria.

The theoretical framework in this study was adopted from Nasab and Ghamsarian's (2015) study. It presented the essential criteria that are commonly evaluated in contractor and subcontractor selection. According to Nasab and Ghamsarian (2015, 440) these six criteria were "financial stability, experience, past performance, technical capacity and quality and safety". In Subchapter 2.2 these criteria were evaluated individually based on earlier literature. The goal was to identify how these criteria have been evaluated and defined in earlier academic studies.

The earlier studies have focused mainly on quantitative analysis on the importance of the criteria. In addition, many studies have focused on the correlation between the emphasised criteria and project success. Some studies have investigated how different professionals have different emphasis on different criteria. In that sense, this study provides an interesting insight on the subcontractor selection criteria. Since this study focused on qualitative analysis on each criterion, it provides an in-depth analysis on how each criterion were used and evaluated throughout the selection process.

The empirical study was done through one example case. The example selected for this study was an on-going construction site called Wood City. In that specific project, Finnish material supplier Stora Enso uses a Norwegian subcontractor called Woodcon. Due to these project specific characteristics, this project offered an extremely intriguing example case for this study since the project is first of its kind in Finland and the background of the two companies provided an international aspect to the study.

The main outcome of the study was that the empirical findings relate closely to the earlier studies on the subject of contractor selection criteria. First of all, the evaluation of selection criteria in the example case of this study was done based on the project specific characteristics. In other words, the emphasis and evaluation of each criterion was done based on what the specific project required. This was in line with the earlier literature. In

addition, the importance of each criterion was the same as in earlier literature which, as a finding, supports the set of criteria as well as the criteria model of Nasab and Ghamsarian (2015).

On the other hand, in this study the earlier business relation was the one of the main factors that affected the selection of the subcontractor. This was not addressed extensively in the earlier literature and hence it acts as an extremely important finding for international subcontracting. Even though the earlier business relation should not be considered as a separate selection criterion alone, it is a factor that moderates the evaluation and emphasis of the other selection criteria. If the earlier business relation is successful, as was the case here, the evaluation of other criteria can be done based on that relation which simplifies the subcontractor selection process in general.

This study and its findings should, through a qualitative empirical study, provide more knowledge of subcontracting and subcontractor selection in an international context. The theme of this thesis is important since the industry is increasingly international and the supply chains in construction projects include a growing number of subcontractors. Hence, this thesis and its results should provide important information that will help contractors and material suppliers to manage the subcontracting processes and subcontractor selections successfully in an international context.

REFERENCES

Abbasianjahromi, H., Rajaie, H., Shakeri, E. & Chokan, F. (2014) A New Decision Making Model for Subcontractor Selection and Its Order Allocation. *Project Management Journal*, 45 (1): 55–66.

Ahti, A. (2010) Rakennusalan taloustaantuman 2009–2012 vertailu talouslamaan 1990–1994. *Rakennustietosäätiö RTS, Rakennustieto Oy ja Rakennusmestarit ja insinöörit AMK RKL ry: Rakentajan kalenteri 2010*, 487–486. Available from: https://www.rakennustieto.fi/Downloads/RK/RK100701.pdf [Accessed on 25th September 2017]

Banaitienė, N. & Banaitis, A. (2006) Analysis of Criteria for Contractors' Qualification Evaluation. *Technological & Economic Development of Economy*, 12 (4): 276–282.

Bubshait, A. & Al-Gobali, K. (1996) Contractor Prequalification in Saudi Arabia. *Journal of Management in Engineering,* 12 (2): 50–54.

Choudhry, R., Hinze, J., Arshad, M. & Gabriel, H. (2012) Subcontracting Practices in the Construction Industry of Pakistan. *Journal of Construction Engineering & Management,* 138 (12): 1353–1359.

Confederation of Finnish Construction Industries RT (2017a) Kuviopankki. Available from: http://www.rakennusteollisuus.fi/kuviopankki/ [Accessed on 23rd August 2017]

Confederation of Finnish Construction Industries RT (2017b) Keskeiset suhdannekuvaajat. Available from: http://www.rakennusteollisuus.fi/Tietoa-alasta/Talous-tilastot-ja-suhdanteet/Kuviopankki/Keskeiset-suhdannekuvaajat/ [Accessed on 23rd August 2017]

Doloi, H. (2009) Analysis of pre-qualification criteria in contractor selection and their impacts on project success. *Construction Management & Economics*, 27 (12): 1245–1263.

Doloi, H., Ilyer, K.C. & Sawhney, A. (2011) Structural equation model for assessing impacts of contractor's performance on project success. *International Journal of Project Management*, 26 (9): 687–695.

Elazouni, A. & Metwally, F. (2000) D-SUB: Decision Support System for Subcontracting Construction Works. *Journal of Construction Engineering and Management,* 126 (3): 191–200.

Eom, C., Yun S. & Paek, J. (2008) Subcontractor Evaluation and Management Framework for Strategic Partnering. *Journal of Construction Engineering & Management,* 134 (11): 842–851.

Eriksson, P. & Kovalainen, A. (2008) *Qualitative methods in business research.* SAGE Publications Ltd., London.

Gholipour, R., Jandaghi, G. & Rajaei, R. (2014) Contractor selection in MCDM context using fuzzy AHP. *Iranian Journal of Management Sciences: A Quarterly,* 7 (1): 151–173.

Gubrium, J.F. & Holstein, J.A. (2001) *Qualitative interviewing' In: Handbook of interview research*. SAGE Publications, Inc. 83–102.

Haapio, A. (2013) Puurakentamisen tulevaisuuden näkymät – Haastettelututkimus. *VTT Technology*, Available from: http://www.vtt.fi/inf/pdf/technology/2013/T141.pdf [Accessed on 27th September 2017]

Hartmann, A., Ling, F., & Tan, J. (2009) Relative Importance of Subcontractor Selection Criteria: Evidence from Singapore. *Journal of Construction Engineering & Management,* 135 (9): 826–832.

Hatush, Z. & Skitmore, M. (1997a) Evaluating contractor prequalification data: selection criteria and project success factors. *Construction Management and Economics.* 15 (2): 129–147.

Hatush, Z. & Skitmore, M. (1997b) Criteria for contractor selection. *Construction Management & Economics,* 15 (1): 19–38.

Hofstede, G. (2017) Finland in comparison with Norway. Available from: https://geert-hofstede.com/countries.html [Accessed on 24th September 2017]

Hosny, O., Nassar, K. & Esmail, Y. (2013) Prequalification of Egyptian construction contractors using fuzzy-AHP models. *Engineering, Construction and Architectural Management,* 20 (4): 381–405.

Iwinski, D. (2015) Dealing with international subcontractors. *Smart Business Pittsburgh,* 22 (6): 9.

Jakrapong, P. & Liston, J. (2003) Contractor ability criteria: a view from the Thai construction industry. *Construction Management & Economics,* 21 (3): 267–282.

Jennings, P. & Holt, G. (1998) Prequalification and multi-criteria selection: a measure of contractors' opinions. *Construction Management & Economics,* 16 (6): 651–660.

Juvonen, A. (2017) Työmaista kasvoi monikulttuurisuuskeskuksia. *Kauppalehti,* Available from: http://www.kauppalehti.fi/uutiset/tyomaista-kasvoi-monikulttuurikeskuksia/eeGzzWZt [Accessed on 18th March 2017]

Karjalainen, M. (2017) Puurakentamisen asema ja mahdollisuudet Suomessa. *Puuinfo,* Available from: http://www.puuinfo.fi/puutieto/puurakentaminen/puurakentamisen-asema-ja-mahdollisuudet-suomessa [Accessed on 26th September 2017]

Koskinen, I., Alasuutari, P. & Peltonen, T. (2005) *Laadulliset menetelmät kauppatieteissä (Qualitative methods in business research).* Vastapaino, Tampere

Kumaraswamy, M.M. (1995) Contractor evaluation and selection: a Hong Kong perspective. *Building and Environment,* 31 (3): 273–282.

Lincoln, YS. & Guba, EG. (1985) *Naturalistic Inquiry.* SAGE Publications Ltd., Newbury Park.

Lättilä, H. (2016) SRV aloittanut Wood Cityn rakennustyöt. *Rakennuslehti*, Available from: https://www.rakennuslehti.fi/2016/06/srv-aloittanut-wood-cityn-rakennustyot/ [Accessed on 27th September 2017]

Mahdi, I., Riley, M., Fereig, S. & Alex, A. (2002) A multi-criteria approach to contractor selection. *Engineering Construction & Architectural Management,* 9 (1): 29–37.

Matthews, J., Pellew, L., Phua, F. & Rowlinson S. (2000) Quality relationships: partnering in the construction supply chain. *International Journal of Quality & Reliability Management.* 17 (4/5): 493–510.

Mbachu, J. (2008) Conceptual framework for the assessment of subcontractors' eligibility and performance in the construction industry. *Construction Management & Economics,* 26 (5): 471–484.

Ministry of Agriculture and Forestry (n.d.) Puurakentamista edistetään. Available from: http://mmm.fi/metsat/puun-kaytto/puurakentaminen-ja-puutuotteet [Accessed on 26th September 2017]

Ministry of Finance (2017) Rakentaminen 2017–2018. Available from: http://vm.fi/documents/10623/3294335/Raksuraportti20172018/fde0ac97-10ee-47a4-b03e-bc1a1808e46b?version=1.0 [Accessed on 18th March 2017].

Ministry of the Environment (2016) Puurakentamisen toimenpideohjelma. Available from: http://www.ym.fi/fi-FI/Maankaytto_ja_rakentaminen/Ohjelmat_ja_strategiat/Puurakentamisen_toimenpideohjelma [Accessed on 26th September 2017]

Nasab, H. & Ghamsarian, M. (2015) A fuzzy multiple-criteria decision-making model for contractor prequalification. *Journal of Decision Systems,* 24 (4): 433–448.

NG, S. & Skitmore, M. (1999) Client and consultant perspectives of prequalication criteria. *Building and Environment,* 34 (5): 607–621.

NG, S., Skitmore, M. & Smith, N. (1999) Decision-makers' perceptions in the formulation of prequalification criteria. *Engineering Construction & Architectural Management,* 6 (2): 155–165.

Partovi, F. Y., Withers, B. E., & Brafford, J. (2002) How tompkins rubber company used analytic hierarchy process to enhance ISO 9000-related decision making. *Production and Inventory Management Journal,* 43 (1): 13–22.

Puri, D. & Tiwari, S. (2014) Evaluating the Criteria for Contractors Selection and Bid Evaluation. *Journal of Engineering Science Invention,* 3 (1): 44–48.

Rashvand, P., Majid, A.Z.M., Baniahmadi, M. & Ghavamirad, F. (2015) 'Contractor selection at prequalification stage: current evaluation and shortcomings'. *Jurnal Teknologi,* 77 (16): 81–89.

Russell, J., Hancher, D. & Skibniewski, M. (1992) Contractor prequalification data for construction owners. *Construction Management & Economics,* 10 (2): 117–135.

Sang Chan, P., Russell, J. & Taha, M. (1998) A distributed problem-solving approach for owner -- contractor prequalification. *Annals of Operations Research,* 78 (1–4): 111–125.

Shenton, A. (2004) Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information,* 22: 63–75.

Sik-Wah, P.F. & Kit-Yung, S. (2000) Final contractor selection using the analytical hierarchy process. *Construction Management & Economics,* 18 (5): 547–557.

Stora Enso Building and Living (n.d.a) CLT, Cross Laminated Timber. Available from: http://buildingandliving.storaenso.com/products-and-services/cross-laminated-timber [Accessed on 14th April 2017]

Stora Enso Building and Living (n.d.b) LVL, Laminated Veneer Lumber. Available from: http://buildingandliving.storaenso.com/products-and-services/lvl [Accessed on 14th April 2017]

Törmänen, E. (2014) Puurakentaminen suomessa lisääntyy, tekijöitä surkean vähän. *Tekniikka & Talous,* Available from: https://www.tekniikkatalous.fi/tekniikka/rakennus/2014-10-03/Puurakentaminen-Suomessa-lis%C3%A4%C3%A4ntyy-tekij%C3%B6it%C3%A4-surkean-v%C3%A4h%C3%A4n-3256050.html [Accessed on 27th September 2017]

Watt, D., Kayis, B. & Willey, K. (2010) The relative importance of tender evaluation and contractor selection criteria. *International Journal of Project Management,* 28 (1): 51–60.

Wong, C., Holt, G. & Harris, P. (2001) Multi-criteria selection or lowest price? Investigation of UK construction clients tender evaluation preferences. *Engineering Construction & Architectural Management,* 8 (4): 257–271.

Wood City (2017) Available from: http://www.woodcity.fi/ [Accessed on 24th August 2017]

APPENDICES

Appendix 1. Earlier empirical studies on contractor selection criteria

Author(s) & Year	Objective & Research method	Main Findings
Hatush & Skitmore (1997a)	Delphic study in order to define the dominant contactor selection criteria	Dominant selection criteria: past failures, financial stability, credit ratings, experience, ability, management personnel and management knowledge
NG & Skitmore (1999)	Questionnaire to evaluate the most important selection criteria	The most important criteria among respondents: financial stability, performance, fraudulent activity, stability of firm, failed contract, standard of quality, health and safety, and competitiveness
NG, Skitmore & Smith (1999)	Questionnaire to identify how the perceptions on selection criteria vary between decision makers	Between professionals, the perceptions on criteria and the importance of selection criteria vary
Banaitienė & Banaitis (2006)	Questionnaire in order: "1. to investigate the contractor selection/evaluation criteria; 2. to evaluate the importance of these evaluation criteria."	The criteria used should be defined based on the "complexity and size of the project" and prioritised according to those
Mbachu (2008)	Questionnaire to prioritise criteria for contractor assessment	Quality of work most important criteria but the subcontractor should be evaluated based on its ability to meet the project requirements
Doloi, H. (2009)	Questionnaire to identify what selection criteria have had an influence on project outcomes	The most important criteria in terms of project success are "soundness of business and finance, technical expertise, site safety records and successful past projects"
Hartmann et al. (2009)	Quantitative analysis in order to find out the relativity of importance of different criteria	The selection criteria are relative and depends on the project's requirements. In addition, contractors are expected to make trade-offs when selecting subcontractors.

Appendix 2. Interview guide in English

What is your background and role in this project?

What is the background of the cooperation between Stora Enso and Woodcon in terms of main contractor – subcontractor relation?

Discussion about the criteria:

1) Financial stability
2) Experience
3) Past performance
4) Technical capacity
5) Resources
6) Quality and safety

Were there any criteria that were not mentioned?

What were the most important criteria the selection process?

Appendix 3. Interview guide in Finnish

Mikä on taustasi ja rooli kyseisessä projektissa?

Mikä on Stora Enson ja Woodconin yhteistyön tausta pääurakoitsija – aliurakoitsija suhteessa?

Keskustelu kriteereistä:

1) Taloudellinen stabiliteetti
2) Kokemus
3) Aikaisempi suorittaminen
4) Tekninen kapasiteetti
5) Resurssit
6) Laatu ja turvallisuus

Onko jotain kriteereitä mitä ei mainittu haastattelun aikana?

Mitkä olivat tärkeimmät kriteerit, jotka vaikuttivat valintaan?