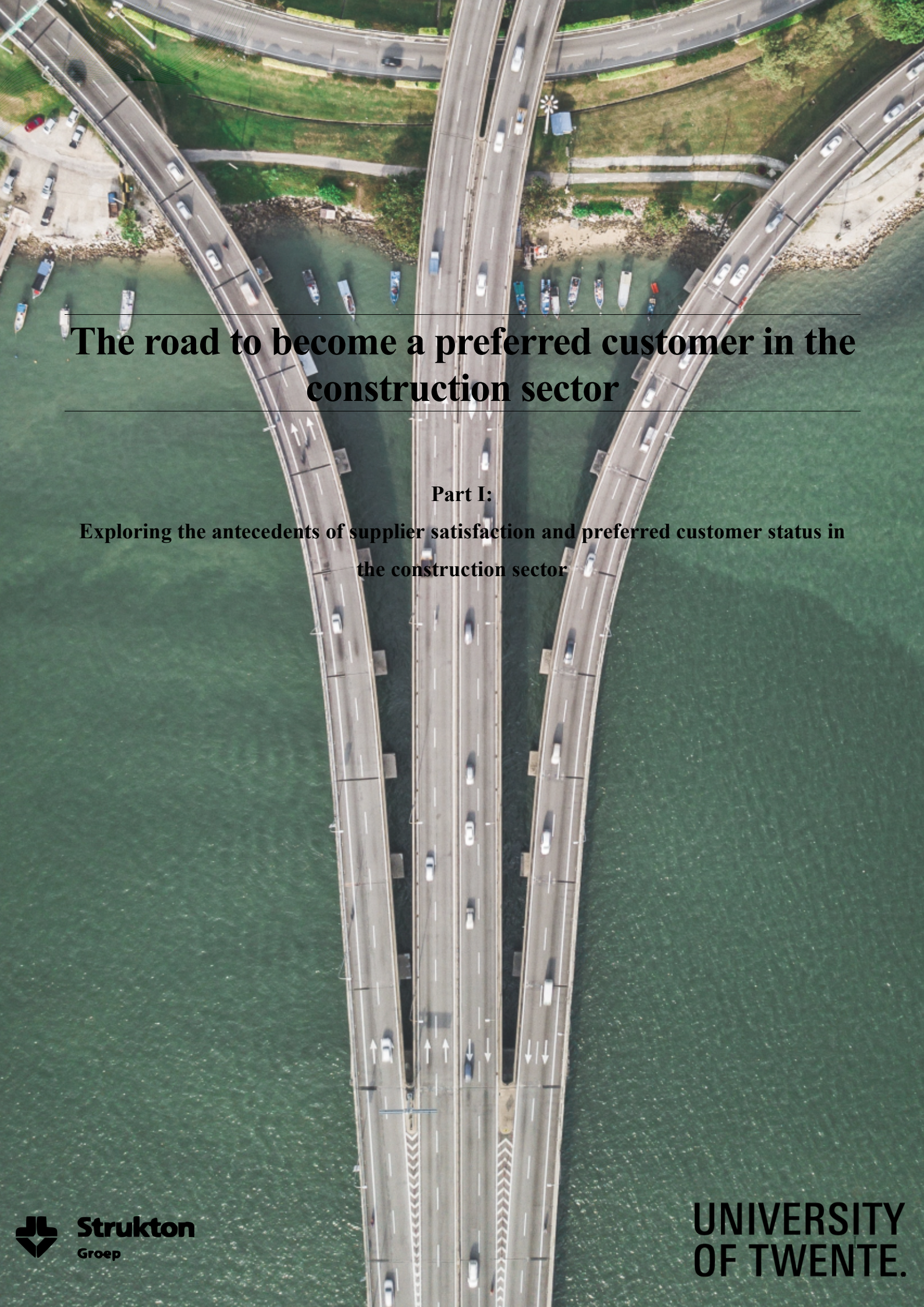

The road to become a preferred customer in the construction sector

Part I:

Exploring the antecedents of supplier satisfaction and preferred customer status in the construction sector

Strukton Groep

UNIVERSITY OF TWENTE.

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Abstract

The construction industry is a very complex industry that deals with one-of-a kind products in local environments by constructing temporary project organizations. The lagging performance of the industry has led to numerous efforts of researchers to increase collaboration and move away from traditional, adversarial practices. One of these efforts is the introduction of innovative procurement methods such as best value procurement. The best value method uses metrics style performance information of managing contractors to award building contracts. This increases the need for managing contractors to work together with the best suppliers and sub-contractors to remain competitive. Many researchers propose partnering with sub-contractors and suppliers as solution to this problem. However, partnering in the construction industry is subject to many constraints and difficulties due to the project-based nature of the industry. Additionally, the road to become a long-term partner in the construction sector remains vague.

Another stream of literature, mostly applied in the automotive industry, proposes another type of buyer-supplier relation to remain competitive. This stream originates from two global trends in supplier markets: (1) the increased outsourcing of core business activities and (2) the reduction of supply bases. This increases the power of excellent suppliers to define their resource allocation. This stream of literature advocates that buyer must become a preferred customer for their key suppliers to have access to their resources. Becoming a preferred customer is depending on the attractiveness of the buyer and the satisfaction of a supplier. This thesis explores this type of buyer-supplier relationship in a project-based industry to see whether this new type of relation can yield insights for existing buyer-supplier relations in the construction industry.

The results of this thesis show that a change in industry context did not yield substantial differences in the antecedents of supplier satisfaction or preferred customer status. Similar to previous studies, this thesis found that relational behaviour and operative excellence are antecedents of supplier satisfaction. Growth opportunities, innovation potential and the involvement/support of suppliers are antecedents of the preferred customer status. Furthermore, by using these insights, a new step-by-step approach is developed to become a preferred customer/ partner in the construction sector (see Figure *1*). The project-based nature of the industry calls for a differentiation between two types of partnering; project-

partnering and strategic partnering. The new framework proposes three steps to develop long-term relations with excellent sub-contractors and suppliers in the construction industry. The first step advocates that a successful first interaction with a new sub-contractor or supplier must focus on establishing trust in capabilities and behaviour. By establishing that trust, a recurrent relation can be developed. The second step is related to the engagement of both supplier and buyer. The results of the statistical analysis show that involving and supporting suppliers can increase engagement of suppliers. Furthermore, the managing contractor must offer growth opportunities to excellent sub-contractors and suppliers to be attractive for a recurrent relation. Both step 1 & 2 must focus on successful project partnering and execution. Additionally, the engagement phase requires investments from both sides and thus the decision to enter the engagement phase must be well evaluated. The last step in the framework advocates that an overarching agreement must be made between buyer and supplier which focusses on non-project specific aspects such as innovation and the measurement of performance information. This should form the basis for long-term relations with excellent sub-contractors and suppliers and additionally, propose a sustainable framework wherein the buyer and supplier can remain successful in the execution projects.

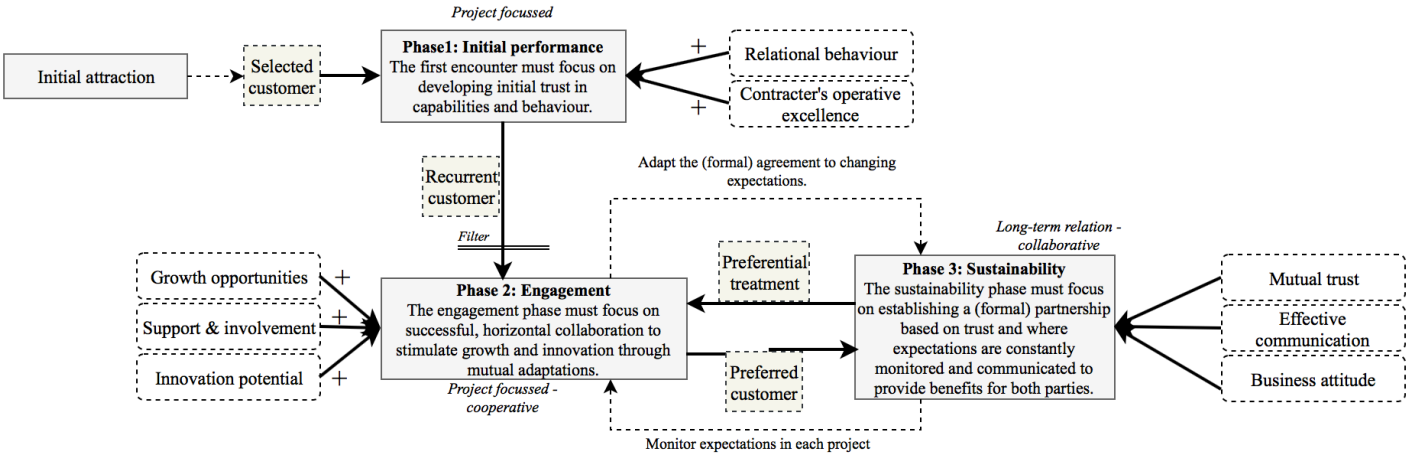

Figure 1: Step-by-step framework for developing long-term relations in a project-based industry

This thesis contributes to the growing knowledge base related to preferred customers and partnerships in construction. By a combination of two well-known concepts, this thesis yields new insights for managing contractors on how to establish successful project and strategic partnerships to acquire a better competitive position in the overall market.

Keywords: Supplier satisfaction, Preferred customer status, Preferential treatment, Construction industry, Partnerships, Best value procurement, Quantifiable performance information.

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List of Abbreviations

Abbreviation	Meaning
BVP	Best value procurement
RM	Reversed marketing
RFP	Request for proposal
RFQ	Request for quotation
QPI	Quantifiable performance information
RAVA	Risks & value added
RQ	Research question
SQ	Sub-research question
SET	Social exchange theory
GDP	Gross domestic product
CSF	Critical success factor
AGC	Associated general contractors
MEAT	Most economically advantageous tender
PLS	Partial least squares
OLS	Ordinary least squares
LLC	Limited liability company
PLSc	Partial least squares consistent
CR	Composite reliability
AVE	Average variance extracted
HTMT	Heterotrait-monotrait
VIF	Variance inflation factor
SRMR	Standardised root mean residual
SEM	Structural equation model
SD	Standard deviation
CI	Confidence interval

1. An introduction to the growing importance of purchasing in the competition over supplier resources and capabilities

The purchasing department of almost every business is gaining increased attention from managers in the last decades. The purchasing volume of products and services bought externally by firms is ever increasing.[1] Additionally, managers have an increased awareness of the contribution of the purchasing function to the overall business performance through, for example, sourcing more products from low-wage countries or by exploiting other sourcing levers.[2] This increased attention have led to changes in the approach that is taken towards purchasing and simultaneously changed the tasks of the purchasing personnel. Whereas traditional purchasers where mostly concerned with ordering products and services, modern purchasers should execute a full array of activities. These activities are the result of the increased strategic relevance of purchasing in the form of high quality, fast delivery, cost savings and customer value.[3] Carr & Smeltzer (1997) define strategic purchasing as; *''The process of planning, evaluating, implementing and controlling highly important and routine sourcing decisions.''*[4]

Similar to the contributions of purchasing to overall business performance, purchasing processes are key in developing a competitive advantage. Strategic purchasing can contribute to the competitive advantage in several ways. Firstly, by effectively managing the purchasing costs and potential savings, profits rise almost equal to the savings made by purchasers. Secondly, valuable information can be gathered about market structure and trends. This information can be valuable in defining and achieving objectives and goals.[5] Lastly, close relations with strategic suppliers can help to improve the quality of products and processes.[6] Altogether, the recognition of the importance of purchasing in achieving business success have contributed to the birth of a more integrated and strategic business function.[7]

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[1] See Schiele (2007), p. 274.; Eatough (2014), p. 1.
[2] See Sánchez-Rodríguez, Hemsworth, & Martínez-Lorente (2005), p. 298.; Carr, Pearson, & Carr (2006), p. 1032.; Schiele (2007), p. 274.; Steinle & Schiele (2008), p. 3.
[3] See Carr et al. (2006), p. 1032.
[4] See Carr et al. (2006) p. 1033. after Carr & Smeltzer (1997)
[5] See Carr et al. (2006), p. 1036.
[6] See McGinnis & Vallopra (1999), p. 46; Hogan, Armstrong, & Hogan (2008) p. 20.
[7] See Carr et al. (2006), p. 1032.

The fact that purchasing is contributing to shareholder value is evident. However, implementing a strategic purchasing function is proven to be difficult. Eatough (2014) points out four main problems related to the implementation of a strategic purchasing function[8]:

1. An unproductive fixation on cutting costs.
2. Organizational isolation.
3. Glacial processes.
4. Acting without inquiry.

To solve the four problems mentioned above, Eatough (2014) states that a firm must become attractive for suppliers, or as he states; *'' Suppliers should be beating down the door to sell their products''*.[9] However recent shifts in market structures and outsourcing practices have led towards a competition for suppliers instead of a competition for buyers as Eatough (2014) implies.[10] Therefore, it is not self-evident that buyers have a choice in selecting & contracting preferred suppliers in the current state of the industry. One of the main causes of this, is the fact that competitors are buying from the same suppliers.[11] This master thesis will elaborate further on the competition for supplier resources in the construction sector. Managing contractors in this sector are heavily depending on supplier and sub-contractors in their projects since almost 90 percent of the total project budgets is sourced externally by buying products and services.[12] It is therefore that the managing contractors purchasing function has a large effect on the project performance.[13]

The next chapter will elaborate on the outline of the research by presenting the research motivation, problem description and research questions. The chapters thereafter will describe all relevant theoretical background related to the research scope. After the theoretical part of this thesis, the methodology will be described. The last chapters will cover the results from this research linked to the theory, possible implications and limitations of this research.

[8] See Eatough (2014), p. 1.
[9] See Eatough (2014), p. 1.
[10] See Schiele, Calvi & Gibbert (2012), p. 1187.
[11] See Dyer & Hatch (2006), p. 702.
[12] See Hartmann & Caerteling (2010), p. 354.; Bemelmans, Voordijk, Vos, & Dewulf (2015), p. 179.
[13] See van Lith, Voordijk, Matos Castano, & Vos (2015), p. 1034.

2. Reversed marketing and Best Value procurement introduced the need for managing contractors to become a preferred customer for their key suppliers

2.1. Public clients are using the Best value procurement method to select the expert for their project through an assessment of quantifiable performance information

A shift in procurement approaches of clients have led to more emphasis on the performance of the contractors (and their sub-contractors). Traditional procurement methods, which mostly award contracts based on the lowest price, result in information asymmetry between managing contractors and sub-contractors.[14] New procurement methods follow a trend towards a more principle-steward type of relation wherein goals are aligned and trust is the basis for a relation. One of these methods is Best Value procurement. The Best value procurement method is developed by Dean Kashiwagi and is also called performance purchasing.[15] This new procurement method is focused on selecting the best possible contractor for a construction project by integrating past-performances of contractors in the award process. The Best value procurement method is increasingly growing in the Dutch public procurement sector. In 2013 there were only 4 best value tenders and in 2015, there were already 103 best value tenders.[16] This rise in the application numbers shows that this innovative procurement method is becoming increasingly important for construction contractors. And therefore, several scholars explored the Best value procurement method with Dutch contractors.[17]

Within this method the client only compiles a list of project goals which form a direction for the contractors to make bids on. By leaving the specification part open-ended, the client trusts the contractors (expert) that he is competent enough to meet the project goals. This opens up more room for solutions and additionally stimulating contractors to innovate their products and processes.[18] By eliminating the specification requirements, the costs for participating in a tender are reduced for both the client and the contractor. This, however, asks a very different view on construction projects from both client and contractors' point

[14] See Snippert, Witteveen, Boes, & Voordijk (2015), p. 569.
[15] See Kashiwagi, Halmrast, & Tisthammer (1996)
[16] See Tenderned (2012;2015)
[17] See Gaaff (2014); Jongerius (2014); Samson (2015); Ivanova (2016)
[18] See Van der Rijt & Santema (2013)

of view. According to Snippert, Witteveen, Boes, & Voordijk (2015), the Best value procedure develops trust in a relationship by using metrics style performance information and goal & risk alignment between client and contractor.[19] For the Best value method to work, the clients must trust the expert (contractor) and ensure a streamlined process.[20]

The importance of trust development by the use of performance information, goal & risk alignment changes the way contractors are, traditionally, approaching a tender procedure. The aspect of goal and risk alignment is mostly covered by the clients' documents on the project. The performance information on the other hand, is solely in de hands of the contractor. The contractors must measure, manage and use this information in a proper way. In general, the Best value process consists of three phases; preparation phase, selection phase and execution phase.[21] The selection phase is the phase wherein the client elaborates on the scope and objectives for a project and the contractor shows their expertise on the objectives by showing performance information to the client. Based on the assessment of the client, one contractor is allowed to proceed. That contractor must proof his claims by showing evidence of his performances. If a contractor is not in the position to substantiate his claims, the contractor is replaced by the second-best contractor of the selection phase. Next to the use of this performance information in the trust development aspect, the substantiation aspect is evenly important when one is designing a process for measuring, managing and using performance information. Many contractors and also scholars, use the term quantifiable performance information (QPI) for this kind of information in Best value tenders.[22]

2.2. Emerging new marketing approach; the first driver to become a preferred customer for key suppliers & sub-contractors

In recent years, there has also been a change to the classical way of approaching the market. Several trends in international industries have caused a switch towards the so-called reverse marketing.[23] Classical marketing theories build upon the situation wherein there is a competition for buyers and reverse marketing builds upon a situation where there is a

[19] See Snippert et al. (2015) p. 569.
[20] See Snippert et al. (2015), p. 579.
[21] See Van der Rijt & Santema (2013)
[22] See Jongerius (2014)
[23] See Schiele et al. (2012) p. 1187.

competition for suppliers. This shift towards reverse marketing is caused by two global trends. Firstly, the increase in out-sourcing of non-core activities leaves more responsibilities at the suppliers and secondly, many industries are reducing their supply base to achieve economies of scale or a reduction of transaction costs.[24] Result of these global trends is the fact that buyers become more dependent on their suppliers since their capabilities are key for developing the buyers capabilities and performance.[25] This shift in approaching the market led to the situation wherein competing firms look for the same resources in the same supply base, resulting in a competition for the best suppliers.[26] Firms that are able to obtain better resources than their competitors have a competitive advantage over their fellow buyers. However, the degree to which a firm is able to attain better resources than their competitors is influenced by the suppliers. The suppliers decide the allocation of their resources. Recent marketing literature shows a rise of various concepts which treat the competition for supplier resources.[27] Among these concepts is the concept of preferred customers. The preferred customer concept is the opposite of the concept of preferred suppliers and is therefore a reaction to the changing market circumstances. In markets where resources are scare, buyers must obtain a preferred customer status to be able to obtain resources from the preferred suppliers.[28] According to Schiele et al. (2012), obtaining the preferred customer status depends on two key constructs; customer attractiveness and supplier satisfaction.[29] However, recent research shows a stronger relation between supplier satisfaction and preferential resource allocation compared to customer attractiveness and preferential resource allocation.[30] This research will therefore use supplier satisfaction as starting point as it is defined by Hüttinger et al. (2014) & Vos et al. (2016).[31]

2.3. The need to obtain quantifiable performance information from key suppliers: the second driver to become a preferred customer for key suppliers

Since the Best Value procurement method put more emphasis on the competences and past performance of the managing-contractor and its suppliers, information management becomes key in winning tenders. Best value tenders include a performance argumentation

[24] See Schiele, Ellis, Eßig, Henke, & Kull (2015), p. 132.; Vos, Schiele, & Hüttinger (2016), p. 4613.
[25] See Koufteros, Vickery, & Dröge (2012), p. 93.
[26] See Dyer & Hatch (2006), p. 703.
[27] See Pulles, Veldman, & Schiele (2016a), p. 1459.
[28] See Pulles et al. (2016a), p. 1459.
[29] See Schiele et al. (2012), p. 1178-1179.
[30] See Pulles et al. (2016b) p. 137.; Vos et al. (2016), p. 4620.
[31] See Hüttinger et al. (2014), p. 711.; Vos et al. (2016), p. 4620.

and risk & value added (RAVA) document wherein the contractor shows that he is the expert for the project through QPI's. This type of information is thus becoming an important aspect for contractors in ensuring continuity of their business due to the rise of Best Value procurement. For managing contractors, which lack large in-house working forces, a large portion of this information is usually generated by their second-tier suppliers. However, the knowledge about the value of this kind of information is not widely spread yet, and sub-contractors/suppliers are not used to share their performance/risk information since they traditionally compete on price only. Additionally, many of those second-tier suppliers are not solely committed to one organization and thus, they are not always willing to provide the managing-contractor with their performance information to be used in best value tenders. To develop a way of obtaining this information, the supplier must give preferential allocation of this information to Strukton over their competitors. Thus, next to the two global trends which cause reversed marketing, Best value procurement can also be seen as one of the drivers managing contractors to become a preferred customer since the performance information of sub-contractors is a non-substitutable (competitive) resource in Best value tenders. And in addition, competitors are trying to accumulate the same information from the same supply base. The consolidated research motivation and problem is formulated below.

Research motivation

In current state of the construction market, managing contractors are looking for suppliers and sub-contractors in the same resource base. The (best) suppliers and sub-contractors are wanted by managing contractors; these suppliers have the power to define the allocation of their resources. For managing contractors who need these resources for their business, it is thus important to enter in a collaborative relation with these suppliers.

Research problem

Prior research shows that increasing supplier satisfaction is the way to receive a preferred customer status and subsequent preferential resource allocation from suppliers. However, none of the prior researchers covered the preferred customer concept in a project-based industry such as the construction industry. The relations with- and between the antecedents of supplier satisfaction and preferred customer status in a project-based industry are thus unknown.

Prior research into supplier satisfaction and preferred customer status mostly focussed on the industrial production industry.[32] For this research, the construction industry will be used as environment. The construction industry is a substantially different industry compared to the industrial production industry. Instead of serial production of a set of predefined products, the construction industry deals with project-based and one-of-a-kind products within a technically complex environment.[33] Within this industry, partnering with key-suppliers has long been seen as a tactic to deal with the characteristics of the industry. Only one prior study focussed on the preferred customer status in the construction industry. This study qualitatively investigated the antecedents and benefits of the preferred customer status. They found that relationship maturity in buyer supplier relations and purchasing volumes are antecedents of preferred customer status in the construction sector.[34] This study will focus on (1) extending the knowledge base with regard to the antecedents of supplier satisfaction and preferred customer status in the construction industry by executing a survey research, and (2) explore the process of becoming a preferred customer by merging prior knowledge related to partnering with the new insights from the quantitative part of this thesis.

RQ 1. What are the antecedents of supplier satisfaction and preferred customer status, and which steps should be taken to become a preferred customer in the construction sector?

To cover the full extent of the subject, several sub-questions are formulated:

SQ 1. How are the concepts of supplier satisfaction, customer attractiveness and preferential resource allocation defined in literature?

SQ 2. Which distinguishing aspects of the construction sector may have an influence on the supplier satisfaction and preferred customer status in the construction sector.

SQ 3. Which of the antecedents defined by Hüttinger et al. (2014) and Vos et al. (2016) are significant in relation to supplier satisfaction and preferred customer status in the construction industry?[35]

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[32] See Hüttinger et al. (2014), p. 706.; Pulles et al. (2016), p. 133.; Vos et al. (2016), p. 4616.
[33] See Dubois & Gadde (2002), p.624.
[34] See Bemelmans et al. (2015), p. 194.
[35] See Hüttinger et al. (2014), p. 711.; Vos et al. (2016), p. 4620.

SQ 4. What is the effect of the contractor's operative excellence on supplier satisfaction and preferred customer status?

SQ 5. What are the most important aspects for Strukton to consider when developing a long-term relation?

3. Receiving preferential treatment by being a preferred customer for your strategic suppliers and sub-contractors

3.1. Social exchange theory as departure point for assessing the relation between supplier satisfaction and preferred customer status

The social exchange theory builds upon the fact that exchanges in business environments are not only based on material goods but also include intangible resources. The core of the SET theory is the relational interdependence that develops over time through interactions.[36] Hence, SET builds upon norms of reciprocity. Entering and maintaining a relationship is expected to be rewarding because of the reciprocity involved.[37] The reciprocity originates from trust between exchange partners. Since social exchange partners build upon social obligations rather than contracts, trust is an important factor in SET.[38] However, the question whether contract precedes trust or that both concepts are complementary is one for debate.[39] Reciprocity is also one of the main problems with the social exchange theory, since there is no certainty that benefits provided by one party will reciprocated by the other party.[40] The rewards that are obtained through social exchanges can be seen as relational benefits. Similar to interpersonal relations, inter-firm relations are developed by repeated interaction between partners. In inter-firm relations, one firm can influence the other by using relational mechanisms.[41] Two of those relational mechanisms are customer attractiveness and supplier satisfaction.

Customer attractiveness is based upon the expectation that a relational connection with another party may prove to be beneficial.[42] Supplier satisfaction on the other hand, is based upon the comparison between expected value and actual value.[43] From a SET perspective, parties only remain in a relation when a certain level of satisfaction is present.[44] SET will be used for this research since the explanatory value of SET in firm behaviour based on relational mechanisms is high.[45] Finally, SET is used in previous research to include both

[36] See Hallen, Johanson, & Seyed-Mohamed (1991), p. 29.; Lambe, Wittmann, & Spekman (2001), p. 4.
[37] See Blau (1989)
[38] See Blau (1968), p. 454.
[39] See Woolthuis, Hillebrand, & Nooteboom (2005), p. 813.
[40] See Das & Teng (2002), p. 449.
[41] See Pulles et al. (2016), p. 141.
[42] See Blau (1989); Schiele et al. (2012), p. 1180.
[43] See Thibaut & Kelley (1959)
[44] See Lambe et al. (2001), p. 8.
[45] See Pulles et al. (2016b), p. 131.

internal and external perspectives on exchange relationships in business to business relations.[46] The following paragraphs will elaborate on preferred customer status, customer attractiveness and supplier satisfaction form a SET perspective.

3.2. Becoming a preferred customer and the benefits of being one

Preferred customer status originates from the concept of reverse marketing wherein customers are competing for the best suppliers.[47] The main reasoning behind this theory can be divided into three different sections[48]:

- Expectations (E)
- Comparison level (Cl)
- Comparison level of alternatives (Cl_{alt})

The first concept relates to the expectations (E) of the relationship and is related to the concept of customer attractiveness. The second concept relates to the comparison level (Cl) and reflects the supplier satisfaction. Together, the expectation and comparison level determine the way the supplier is continuing the relationship. According to Schiele et al. (2012) there are two ways for continuing the business relationship; (1) as regular customer or (2) as preferred customer.[49] This decision depends on the level of available alternatives (Cl_{alt}) for the supplier.[50] The resulting framework is shown in *Figure 2.*

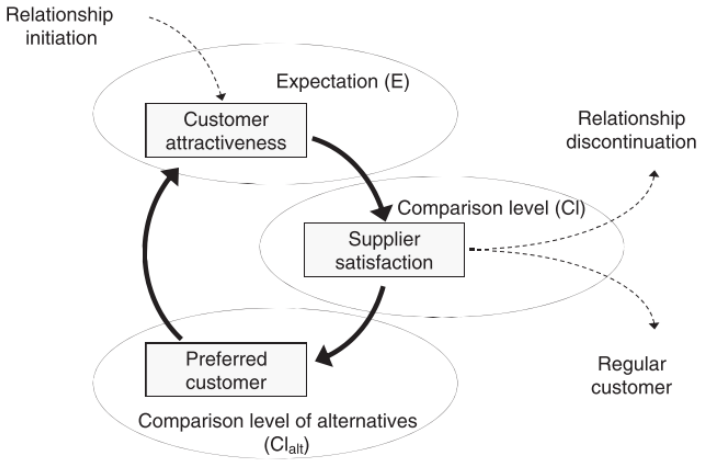

Figure 2: Preferred customer concept[51]

[46] See Anderson & Narus (1990), p. 43.
[47] See Dyer & Hatch (2006), p. 703.; Pulles et al. (2016a), p. 1459.;
[48] See Schiele et al. (2012), p. 1180.
[49] See Schiele et al. (2012), p. 1180.
[50] See Thibaut & Kelley (1959)
[51] See Schiele et al. (2012), p. 1180.

Next to the framework presented above, several authors investigated the exact relations between the three levels in the model. Pulles et al. (2016) found that the impact of customer attractiveness on preferential treatment is affected by supplier satisfaction.[52] The direct relation between customer attractiveness and preferential treatment was not significant when supplier satisfaction was added in the model. And even the relation between supplier satisfaction and preferred customer status is argued to be indirect and mediated by commitment.[53] One of the first to summarize the drivers of the three main concepts were Hüttinger et al. (2012).[54] Later on, Hüttinger et al. (2014) were one of the first to empirically test these drivers. They found that growth opportunities and reliability were the antecedents that positively influence the obtainment of a preferred customer status.[55] The study of Bemelmans et al. (2015) found that annual spend, relation specific investments and relationship maturity influences preferred customer status in the construction sector.[56] Sunil Kumar & Routroy (2016) found that top management support and proper communication channels are also influencing the chance to become a preferred customer.[57] Sunil Kumar & Routroy (2016) also found that the customer must focus on creating risk & profit sharing mechanisms and supplier incentives to meet supplier interests.[58]

Additionally, there are several benefits that can follow from being a preferred customer. Nollet, Rebolledo, & Popel (2012) describe five categories wherein benefits can be obtained by being a preferred customer. Firstly, they describe benefits for product quality and innovation. By being a preferred customer, buyers receive consistent quality levels or are able to opt for customized products. The second category is related to support. Benefits include, among others, sharing of innovations and sharing of information about products and markets. The third category are reliability benefits, for example, the situation where the demand exceeds supply. In such's a situation, the buyer receives preferential allocation of the scare resources. The last two categories are related to price and cost benefits such as a lower price for products or lower acquisition/operational costs for the preferred customer.[59]

[52] See Pulles et al. (2016), p. 137.
[53] See Baxter (2012), p. 1251.
[54] See Hüttinger, Schiele, & Veldman (2012), p. 1202.
[55] See Hüttinger, Schiele, & Schröer (2014), p. 711.
[56] See Bemelmans, Voordijk, Vos, & Dewulf (2015), p. 194.
[57] See Sunil Kumar & Routroy (2016), p. 1186.
[58] See Sunil Kumar & Routroy (2016), p. 1185.
[59] See Nollet et al. (2012), p. 1187.

Next to these benefits described, Nollet et al. (2012) also propose a framework for becoming a preferred customer.[60] The four steps that are described are shown below:

1. Initial attraction (customer attraction)
2. Performance (supplier satisfaction)
3. Increasing supplier commitment and engagement
4. Sustaining the preferred customer status

The framework that is presented by Nollet et al. (2012) is based upon the notion that attractiveness precedes supplier satisfaction (step 1 & 2). The third step in becoming a preferred customer is to increase commitment from the supplier. Nollet et al. (2012) propose several tactics that can be used to increase supplier commitment. These tactics are based upon two main categories; (1) ensure operational excellence and (2) create relational value.[61] Important in operational excellence is the reassessment of processes to find solution to problems, which relate to low customer attractiveness or supplier satisfaction. Furthermore, relational value can be increased by employing senior personnel or by sharing important information early on. The framework also shows similarities with the results from Baxter (2012) who found that commitment is needed to become a preferred customer.[62] The final stage of the framework includes the maintenance of the relationship. This can be achieved by sharing performance results with the supplier or early communication about potential problems and risks.[63]

3.3. Customer attractiveness as source of initial allocation of resources and reciprocity

Customer attractiveness is according to Blau (1962) inherent to social exchange.[64] Attractiveness is the force that increases the scope of social interaction and is the source of motivation for initial allocation of resources and subsequent reciprocity.[65] Moreover, the level of attraction of a firm depends on the ability to provide relevant rewards to the other party.[66] In the customer attractiveness literature, there are three different streams. Mortensen (2012) divided the literature in (1) attraction in buyer-supplier relationship management, (2)

[60] See Nollet et al. (2012), p. 1188-1189.
[61] See Nollet et al. (2012), p. 1191.
[62] See Baxter (2012), p. 1251.
[63] See Nollet et al. (2012), p. 1192.
[64] See Blau (1962)
[65] See Ellis, Henke, & Kull (2012), p. 1260.
[66] See Blau (1989)

customer attractiveness to suppliers and (3) attraction in key account or portfolio management.[67] The second stream of literature is relevant for this research and will therefore be used for elaborating customer attractiveness. According to Ellis, Henke, & Kull (2012) attractiveness is the result of relational mechanisms described by SET theory such as trust, dependence, interaction and expected value.[68] By interacting with other firms, firms show insights into the expected value that can be gained by entering a relationship. Expected value is the result subtracting direct and opportunity costs from rewards, and thereby provides insights into cost-reduction abilities of a partner.[69] However, expected value can be perceived different by buyers and suppliers according to Hald, Cordón, & Vollmann (2009).[70] In *Table 1,* the main components of expected value, trust and dependence are shown which were developed by Hald et al. (2009).

Table 1: Relational mechanisms and their perceptions.

	Buyer perceptions	**Supplier perceptions**
Expected value	Cost reduction	Price
	Time compression	Volume
	Innovation	Growth
	Access to new buyers/ suppliers	
	Competency development	
Trust	<u>Perceived benevolence trust:</u>	
	Loyalty	
	Support	
	<u>Perceived integrity trust:</u>	
	Shared values	
	Fairness	
	Reliability	
Dependence	Expected association value	
	Association alternatives	
	Level of transaction specific assets	

Following from Blau (1962), attraction influences the level of reciprocity in a relation.[71] Reciprocity originated from social pressure, trust and moral standards to ensure a fair exchange. However, a failure to return the favour may lead to a decrease in trust and commitment of a relation. Reciprocity is thus key in maintaining relationships and is backed by substantial social and individual pressure.[72] The literature study of Hüttinger et al. (2012) shows various categories which are arguably affecting customer attractiveness in buyer-

[67] See Mortensen (2012), p. 1209–1211.
[68] See Ellis et al. (2012), p. 1260.
[69] See Hald et al. (2009), p. 963.; Ellis et al. (2012) p. 1260.
[70] See Hald et al. (2009), p. 964.
[71] See Blau (1962)
[72] See Blau (1968), p. 454.; Ellis et al. (2012), p. 1260.

supplier relations.[73] The categories are divided into (1) market factors such as size and market share, (2) risk factors such as standardisation and demand stability, (3) technological factors such as skills and knowledge transfers, (4) economic factors such as margins and price, (5) social factors such as participation and behaviour.

3.4. Satisfying suppliers by matching expectations and outcomes

Supplier satisfaction is the third concept derived from SET. Thibaut & Kelley (1959) describe that the level of supplier satisfaction depends upon the evaluation of expected value and actual value developed in a relationship.[74] Effectively, this comes down to the quantity of rewards and costs associated with the relation. Previous research into satisfaction is mostly characterized by the buyer's perception on satisfaction rather that the suppliers perspective.[75] Schiele et al. (2012, p. 1181) define supplier satisfaction as ''*supplier satisfaction is a condition that is achieved if the quality of outcomes from a buyer-supplier relationship meets or exceeds the supplier's expectations*''. Benton & Maloni (2005, p. 2) describe supplier satisfaction as ''*a feeling of equality despite power imbalances*''. Supplier satisfaction is thus achieved when the expectations are met and there is no power imbalance that leads to inequality. Hence, a minimum level of satisfaction is required to have motivation to maintain the relationship. Important in maintaining this minimum level of satisfaction is joint evaluation of outcomes to see where improvements can be made in the relation.[76] The increased outsourcing of business activities calls for increased cooperation between buyer and supplier to meet the end-users requirements.[77] Supplier satisfaction is key in successful cooperation and business performance. Wong (2000) states that satisfied suppliers are more willing to cooperate with the buyer to meet the demands from their clients.[78] Additionally, Hüttinger et al. (2012) state that a relational and cooperative approach to suppliers will enhance supplier satisfaction.[79] Thus, satisfied suppliers are more willing to engage in cooperation, and cooperation will enhance supplier satisfaction. These conclusions support the framework of Nollet et al. (2012) wherein a minimum level of

[73] See Hüttinger, Schiele, & Veldman (2012), p. 1199.
[74] See Thibaut & Kelley (1959)
[75] See Essig & Amann (2009), p. 103–104.
[76] See Schiele et al. (2012), p. 1181.; Nollet et al. (2012), p. 1190.
[77] See Wong (2000), p. 427.
[78] See Wong (2000), p. 427.
[79] See Hüttinger et al. (2012), p. 1189.

satisfaction is needed to start cooperating and further an increase of satisfaction is achieved by successfully cooperating (consistently meet suppliers needs).[80]

In literature, several authors made distinctions in categories of supplier satisfaction antecedents. From these different approaches, Hüttinger et al. (2012) composed a list of the drivers for supplier satisfaction divided into four categories; (1) technical excellence such as supplier development and early supplier involvement, (2) supply value such as volumes and long-term horizons, (3) mode of interaction including communication and structure and (4) operational excellence, which includes forecasting and payment habits.[81] Based upon these driver, research into supplier satisfaction must focus on the discrepancy between expected and actual value of these antecedents to determine supplier satisfaction.

3.5. The basic dimensions to measure supplier satisfaction

The measurement tool used in this study is based upon earlier research into supplier satisfaction and preferred customer status.[82] This measurement tool was originally developed by Hüttinger et al. (2014). This study used a world café method with several discussion groups to discuss various antecedents of supplier satisfaction and preferred customer status.[83] By using inductive coding, Hüttinger et al. (2014) defined eight possible antecedents of supplier satisfaction and preferred customer status. Moreover, Hüttinger at al. (2014) defined the constructs supplier satisfaction and preferred customer status.[84] Furthermore, Vos et al. (2016) defined two additional constructs; profitability and preferential treatment. For their study, Vos et al. (2016) differentiated between supplier intention (preferred customer status) and supplier behaviour (preferential treatment). The constructs of the measurement tool used in this study are shown in Table *2*.[85] The entire measurement tool is shown in Appendix B.

[80] See Nollet et al. (2012), p. 1190.
[81] See Hüttinger et al. (2012), p. 1202.
[82] See Hüttinger et al. (2014); Vos et al. (2016)
[83] See Hüttinger et al. (2014), p. 701.
[84] See Hüttinger et al. (2014), p. 703.
[85] See Hüttinger et al. (2014), p. 702.

Table 2: Constructs of the measurement model.

Antecedents	**Aspects**
Growth opportunities	Growth, volume, brand name, image.
Innovation potential	Expertise, innovation possibilities/ orientation.
Operative excellence	Planning, decision making and processes.
Reliability	Opportunism, adherence to agreements, contract compliance.
Support of suppliers	Training, development and advice.
Supplier involvement	Early and close involvement in NPD processes.
Contact accessibility	Cross-functional contact person.
Relational behaviour	Solidarity, mutuality and flexibility.
Profitability	Profits, margins.

4. The construction sector is a highly complex and project-based industry with poor performance compared to other high-tech industries

4.1. Complexity and interdependencies are the underlying causes for a poor performing industry

The construction industry is a large contributor to almost every national economy. The construction sector in the European union accounts for 5.4% of the total gross value added.[86] In the Netherlands, the construction sector accounts for 4,5% of the GDP and reported a revenue of 63,3 billion euro in 2017.[87] Despite the fact that a significant portion of the GDP is generated by the construction industry, there are various researchers that claim that the construction industry is characterised by poor performance.[88] The UK reports from Egan (1998) and Latham (1994, 2001) were one of the first to show several prevailing, problematic aspects of the construction industry.[89] Both authors recognize the price only procurement methods as one of the main contributors to this lagging performance of the industry. Even today, the performance of the construction industry is a subject of academic research.[90] Poor performance of the industry leads to cost overruns, late deliveries, quality problems and conflicts.[91] Two overarching aspects of the construction sector are the underlying cause of the poor performance of the sector. These two aspects are the complexity of- and interdependencies between processes and products.

Managing contractors in the construction industry are in essence, a special kind of service companies for their clients and are thus mostly burdened with the management of information flows.[92] They must monitor their environment, gather information, make decisions and ensure that the intended result is achieved.[93] However, there is always information missing which is resulting in uncertainty (see Figure *3*). This uncertainty forms the context in which construction contractors are operating and is therefore one of the drivers for the complexity in this sector.

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[86] See Nazarko & Chodakowska (2015), p. 204.
[87] See Bouwend Nederland (2017)
[88] See Latham (1994), p. 7.; Egan (1998), p. 12.; Gadde & Dubois (2010), p. 254.
[89] See Egan (1998); Latham (1994, 2001)
[90] See Nazarko & Chodakowska (2015), p. 204.; Snyman & Smallwood (2017), p. 651–652.
[91] See Crespin-Mazet & Portier (2010), p. 230.
[92] See *Based on Winch (2010) after* Galbraith, (1977); March & Simon, (1993)
[93] See Winch (2010), p. 8.

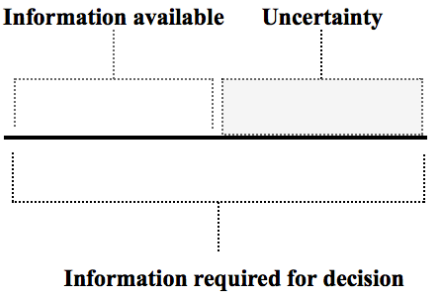

Figure 3: Adapted from Galbraith (1977) fig. 3.1.

Moreover, Gidado (1996) argues that the complexity of the construction industry is continuously increasing due to a variety of reasons such as economic liberalisation and increasing fragmentation of the industry.[94] Fearne & Fowler (2006) further elaborate on the complexity of the construction industry and point to the fragmented structure of the supply chain, adversarial relations, poor information flows and a high degree of dependency between activities and tasks as the source of the uncertainty and complexity.[95] In their paper on complexity and interdependency in the construction industry, Dubois & Gadde (2002) describe the six central features of the construction industry; (1) focus on single projects, (2) local adjustments, (3) utilization of standardised parts, (4) competitive tendering, (5) market-based exchange and (6) multiple roles.[96] These features cause various interdependence and uncertainty problems within the construction industry. A specific elaboration of the sources related to the complexities and uncertainties in the construction industry is shown in Table *3*.

Table 3: Sources of complexity and uncertainty in construction.[97]

Complexity	**Uncertainty**
Number of technologies and interdependencies. Rigidity of sequences between various main operations. Overlap of stages or elements of construction.	Lack of complete activity specification. Unfamiliar with local resources and local environment. Lack in uniformity of materials, work and teams with regard to time and place. Unpredictability of the environment.

Another view at complexity is provided by Whyte, Stasis, & Lindkvist (2016) who state that complex projects are characterised by high-tech, capital intensive engineering, which are significant in scale and duration.[98] This type of complexity requires firms to work

[94] See Gidado (1996), p. 214.
[95] See Fearne & Fowler (2006), p. 284.
[96] See Dubois & Gadde (2002), p. 624.
[97] See Dubois & Gadde (2002), p. 624.
[98] See Whyte et al. (2016), p. 339.

collaboratively across firm boundaries in project delivery.[99] Next to the intra-firm collaboration in one project, a contractor also has to deal with several projects simultaneously. This multi-project environment leads to more interdependencies between resources employed on projects and therefore increases complexity.[100] For a successful project, the main contractor thus has to deal with both internal and external complexity.[101] Winch (2010) refers to a project organisation as a coalition of resource bases within a portfolio of projects (see *Figure 4*).[102] Within the coalition of resource bases (each with own interest), a managing contractor is responsible for the project coordination. Within the portfolios of projects, the firm is responsible for coordination with the firm.[103] Furthermore, both internal and external complexity increase the difficulties of managing supply chains, which are often formed by a large number of sub-contractors and suppliers due to the fragmentation of the industry.[104]

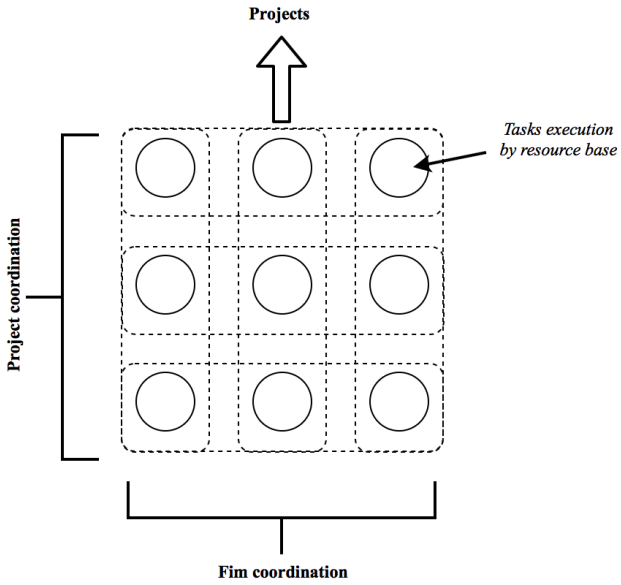

Figure 4: Winch (2010, p. 9) adapted from Fellows et al. (1983) fig. 1.1.

An additional difficulty, which is widely recognized in the construction industry is the management of innovation and learning.[105] Bakker, Cambré, Korlaar, & Raab (2011) describe the learning paradox of construction projects.[106] On the one hand, construction projects are very suited for creating knowledge and stimulating innovation because of their

[99] See Whyte et al. (2016), p. 339.
[100] See Hagan, Bower, & Smith (2012), p. 1122.
[101] See Siao & Lin (2012), p. 133.
[102] See Fellows (1983); Winch (2010), p. 9.
[103] See Winch (2010), p. 9.
[104] See Dainty, Briscoe, & Millett (2001), p. 842.
[105] See Hartmann & Dorée (2015), p. 341.
[106] See Bakker, Cambré, Korlaar, & Raab (2011), p. 494.

inter-disciplinary and high-tech nature.[107] But on the other hand, the temporary nature of projects makes it difficult to transfer knowledge between projects.[108] Hence, the focus on efficiency on project basis, results in an obstacle for learning and innovation.[109]

4.2. Interactions in the construction industry: firm and project boundaries influence interactions between buyers and suppliers

The basic idea behind the way the industry is dealing with the complexity and interdependencies is described by Dubois & Gadde (2002). They elaborate in their paper on two types of couplings in the construction sector; (1) loose couplings and (2) tight couplings. These couplings originate from the notion that there is always some sort of dependence between different units in a construction project. The number of shared variables between units determines the classification of the coupling (e.g. loose or tight). If there are not many shared variables and the dependence between two units is minimal, the couplings are classified as loose. If there is a high dependence between two units, the couplings are tight. Based upon the characteristics of the construction industry and its environment, Dubois & Gadde (2002) describe four situations of couplings. These four situations are: (1) coordination within projects, (2) coordination within supply chain, (3) coordination within firms and (4) coordination beyond individual projects.[110] Within these situations, various configurations are possible between loose and tight couplings. However, couplings are interrelated and thus, changing one coupling will change another as well.[111]

In general, the couplings on individual projects are tight and couplings in the permanent network are loose. This configuration allows firms to provide the necessary slack in projects through loose couplings in the permanent network.[112] Other reasons for this configuration of couplings is the decentralisation of authority in individual projects and the presence of need and transaction uncertainty as a result of competitive tendering.[113] These couplings were similar to other industries in the past, however, these industries recognized the advantages

[107] See Scarbrough et al. (2004), p. 1584.
[108] See Cacciatori (2008), p. 1592.
[109] See Dubois & Gadde (2002), p. 630.
[110] See Dubois & Gadde (2002), p. 624-626.
[111] See Dubois & Gadde (2002), p. 630.
[112] See Dubois & Gadde (2002), p. 627.
[113] See Dubois & Gadde (2002), p. 627-628.

of establishing and maintaining close relationships with partners across projects in the permanent network and thus adapted the couplings in their permanent network.[114]

Further research into the interactions between managing contractors and sub-contractors in the construction industry is also conducted by Gadde & Dubois (2010). They investigated typical relationships in the construction industry based upon the six dimensions of a high involvement relationship: (1) longevity, (2) adaptations, (3) dependence, (4) interaction, (5) atmosphere and (6) mutual orientation.[115] Gadde & Dubois (2010) state that the interaction patterns of high involvement relationships provide the necessary conditions for long-term relations because it provides mutual orientation, adaptations and learning.[116] They found that the construction industry is characterized by irregularity, adverse relations and low loyalty. This leads to only few adaptations in the permanent network and a high amount of project based, on-site adaptations (e.g. loose couplings & tight couplings).[117] Additionally, the irregularity of the industry (need & transaction uncertainty) also withholds firms to increase their organizational dependencies and increase their innovation and knowledge sharing capabilities.[118] Since the industry is characterized by these adverse relations, collaboration is not embedded into the interaction patterns.[119] Thus, even though the interaction patterns in construction show signs of high involvement relations, the benefits of high involvement relations are not reaped in the construction sector. [120]

4.3. Partnering as a solution to poor performance within the construction sector: benefits, constraints and success factors

Since the construction industry plays a major role in the economic growth of a country, many researchers have focussed on the lagging performance of the industry. Various of these researchers have focussed their research on the couplings in the permanent network, especially on partnerships.[121] The rationale behind this research direction is the fact that the construction industry is behind in adapting the couplings in their permanent network despite

[114] See Dubois & Gadde (2002), p. 627.
[115] See Gadde & Dubois (2010), p. 256.
[116] See Gadde & Dubois (2010), p. 259.
[117] See Gadde & Dubois (2010), p. 257.
[118] See Gadde & Dubois (2010), p. 260.
[119] See Gadde & Dubois (2010), p. 258.
[120] See Gadde & Dubois (2010), p. 259.
[121] See Black, Akintoye, & Fitzgerald (2000); Vrijhoef & Koskela (2000), p. 169.; Gadde & Dubois, (2010); Crespin-Mazet, Havenvid, & Linné (2015); Havenvid, Holmen, Linné, & Pedersen (2017)

the fact that partnering is a widely investigated and recommended approach to solve these problems.[122] There are various benefits that are the result of successful partnering in the construction industry such as an improved contractual situation, improved information flow, improved efficiency and financial position, reduced costs & risks and improved quality.[123] Additionally, it is advocated that partnering is an indispensable part of a contractors total quality system since the development & enhancement of customer-supplier relations can substantially improve the quality gained from the supply chain.[124]

However, there are also different constraints defined for partnering in the construction sector. Frödell (2009) distinguished four categories of constraints for establishing and maintaining managing contractor – sub-contractor relations in the construction industry; organizational structure, long vs short term, purchasing volumes and specification of products.[125] Regarding organizational structure, the local and one-of a kind character of each construction project calls for local decisions.[126] These are often well-thought-out for their effects on the project, however, these decisions can prove to be bad for the organization as a whole. Moreover, this local character of construction can also have an influence on supplier selection. Suppliers which are much closer to the construction site have a significant advantage in terms of logistics and price, opposed to suppliers which are relatively far away. Lastly, project managers can have different types of working and establishing relations with suppliers and therefore, the constant variation between projects in terms of working relation can also form a constraint for suppliers to engage in a partnership.

For managing contractors, a long-term perspective can prove to be beneficial in terms of a reduction of transaction cost and improving productivity. However, the focus on single projects in terms of incentives and KPI's drive the managing contractor to have a short-term focus in their supplier relations. The next constraint to partnering related to the relative purchasing volume. Many sub-contractors and suppliers supply les then ten percent of their total volume to one managing contractor which reduced the incentive to cooperate in long-term relations. Lastly, every project has its own product. Therefore, clients often use detailed

[122] See See Egan (1998); Latham (1994, 2001); Gadde & Dubois (2010); Havenvid, Holmen, Linné, & Pedersen (2017)
[123] See Matthews (1996), p. 46.; Black et al. (2000), p. 430.; Gadde & Dubois (2010), p. 254.
[124] See Dyer (1996); Kanji & Wong (1998), p. 136.; Wong & Fung (1999), p. 207.
[125] See Frödell (2009), p. 23–25.; Frödell (2011)
[126] See Dubois & Gadde (2002), p. 624.

specifications of products and materials. This limits the room for purchasers to establish long-term relations with suppliers and sub-contractors since the change in specifications may lead to an inevitable choice for other suppliers.[127] These constraints are supported by Bemelmans et al. (2015) who state that the temporary organisations among firms acts as constraint to long-term relations because project teams and product design change for each project.[128]

Next to the constraints of partnering in the construction industry, various authors described key success factors for establishment and maintenance of partnerships. Cheng, Li, & Love (1999) defined ten critical success factors for partnering. This framework also includes possibilities for measuring these CSF's.[129] Furthermore, Black, Akintoye, & Fitzgerald (2000) empirically investigated 19 success factors for partnering in construction and found similar CSF's compared to the study of Cheng, Li, & Love (1999).[130] However, some additional CSF's were found and defined as; actions consistent with objectives, a dedicated team, flexibility with regard to changes and commitment to continuous improvement.[131] The paper of Humphreys, Matthews, & Kumaraswamy (2003) provides a comparison of partnering elements in the construction industry.[132] This study focussed especially on the relation between maincontractor and subcontractor. Humphreys et al. (2003) found that communication, trust, goals & objectives, continuous evaluation and problem solving are key elements of partnering.[133] One of the most recent studies into construction partnering was conducted by Kim & Nguyen (2018). They found thirteen key factors which affect relationships in the construction industry.[134] Other authors which have investigated the success factors of partnering are, among others, Chan et al. (2004) and Bayliss, Cheung, Suen, & Wong (2004, p. 262).[135] A review of these CFS's shows substantial overlap with the drivers of supplier satisfaction. This supports the notion that successful cooperation has a positive effect on supplier satisfaction.[136] An overview of these success factors is shown in Appendix A.

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[127] See Frödell (2009), p. 23–25.; Frödell (2011)
[128] See Bemelmans, Voordijk, & Vos (2012), p. 163.
[129] See Cheng et al. (1999), p. 86.
[130] See Black et al. (2000), p. 429.
[131] See Black et al. (2000), p. 429.
[132] See Humphreys et al. (2003), p. 169.
[133] See Humphreys et al. (2003), p. 169.
[134] See Kim & Nguyen (2018), p. 176.
[135] See Bayliss et al. (2004), p. 262.; Chan et al. (2004), p. 195.
[136] See Wong (2000), p. 429.

Furthermore, there are two distinctions present in the partnering literature that deserve attention in relation to this thesis. First of all, many researchers did research into partnering between the client and the managing contractor instead of examining the relation between managing contractor and sub-contractors.[137] Secondly, the type of partnership investigated is also changing each research. In general, there are two-types of partnering between managing contractor and sub-contractors. These two types are project-partnering (short-term) and strategic partnering (long-term). However, there are also extensions of these two general types such as semi-project partnering.[138]

Lastly, there is not a one size fits all approach to partnering in the construction sector. Eriksson (2010, p. 908) defined several tactics that can be used by managing contractors to enter in a competitive, coopetition or collaborative relation with sub-contractors. However, these tactics do not define exact steps for developing a specific type of partnership. Moreover, the association of general contractors in America defined 5 steps which are needed to enter in a partnering type of relation.[139] The first step is educate your own organisation in partnering. Secondly, the decision to partner must be made. Thereafter, the intentions which underlie the decision to use partnering must be clear. Fourth, the senior management from both companies must show commitment to partnering. The last step is to organize a partnering workshop with all key players to streamline the process. The steps defined by AGC are focussed on the internal efforts to enter in a partnership. Similar is the approach of Cheng & Li (2004) who used procedural mapping to define an approach to partnering.[140] They make distinctions between formation, application and reactivation processes.[141] A common aspect in all these studies is the fact that they only partially incorporate the sub-contractor's view on partnering through critical success factors. Besides those success factors, most studies solely focus on internal efforts and processes which are needed for successful partnering. They also do not distinct between short-term and long-term partnerships. A study that does distinct between the different types of partnering is the study of Humphreys et al. (2003). He states that the partnerships evolve over time through

[137] See Ng, Rose, Mak, & Chen (2002), p. 437.; Naoum (2003), p. 71.; Beach, Webster, & Campbell (2005), p. 919.
[138] See Humphreys et al. (2003), p. 176.; Bygballe, Jahre, & Swärd (2010), p. 241.
[139] See The Associated General Contractors of America [AGC] (1991), p. 5.
[140] See Cheng & Li (2004), p. 793.
[141] See Cheng & Li, (2002), p. 201.

learning. However, this study also does not propose any specific steps for developing a partnership.

Following up on this gap in literature, this thesis explores another type of buyer-supplier relation (preferred customers) and aims at increasing the knowledge base on the steps to be taken. Especially the factors which are of interest for suppliers are examined (e.g. the antecedents of supplier satisfaction and preferred customer status).

5. The role of managing contractors in the construction industry

5.1. The interface between public clients and private sub-contractors

The previous chapter elaborated on the specific characteristics of the construction industry and their relation with the lagging performance of the industry and long-term relations. This chapter will continue on elaborating the characteristics of the industry in relation to tender procedures, the regulatory context and the interface which is formed by managing contractors between clients and the downstream supply chain.

Public organizations in the Netherlands have the obligation to follow European procurement laws when approaching the market. For projects above certain thresholds, specific procedures must be followed. The current threshold for a European tender is approximately 5.54 million for construction project.[142] Other thresholds are shown in Figure *5*.

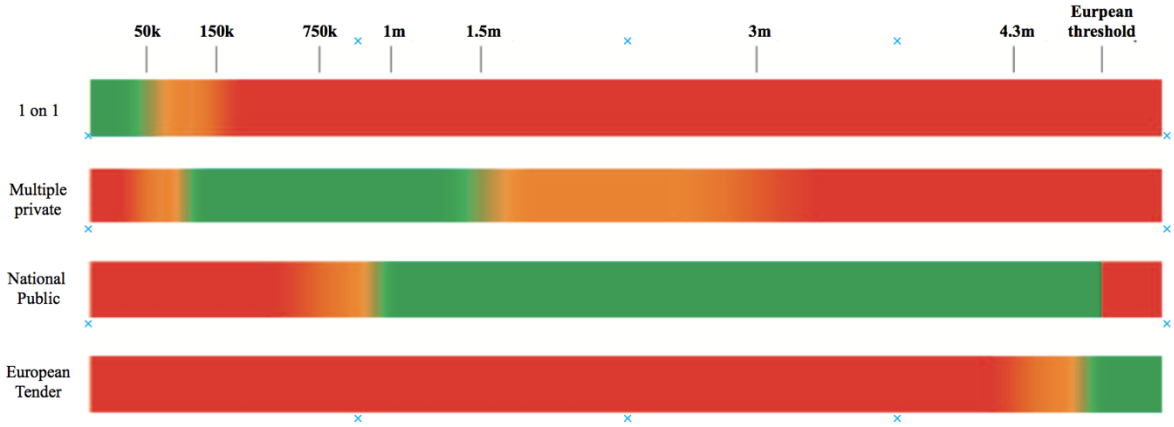

Figure 5: Thresholds for tender procedures.

These thresholds form a guide for public organizations to decide which procedure to follow. For the 1 on 1 and multiple private procedures, the client is free to choose who he wants to invite to participate and is not obligated to publish the tender documents. For the national public and European tender procedure, the client is obligated to publish all documents. In these public procedures, a client can use selection criteria based on the projects characteristics to execute pre-selection and lower the amount participants.[143] Within these overall procedures, clients must use some sort of MEAT (most economically advantageous tender) criterion in their procedure, the only exception for this are projects which are highly standardised. This MEAT criterion can take on different forms such as Best value procurement or a competitive dialogue. This part of the tender procedures has an impact on

[142] See Het Europees Parlement (2014/24/EU)
[143] See Ministery of Economic affairs (2016), p. 50–52.

the integration of the supply chain since the choice of procedure has influence on the amount of integration in the tender and execution phase. For example, in Best value procedures, the amount of performance information needed stimulates the integration of sub-contractors into the tender process. Additionally, the usage of BVP also stimulates the integration of design, calculation and execution within the supply chain to come up with the optimal solution (Best value).

Furthermore, Figure *6* shows the flow of information and materials in a typical (traditional) construction supply chain.[144] This figure shows that the main contractor forms an important interface between the client to the left and sub-contractors and suppliers the right. It also shows the highly fragmented nature of the construction industry.

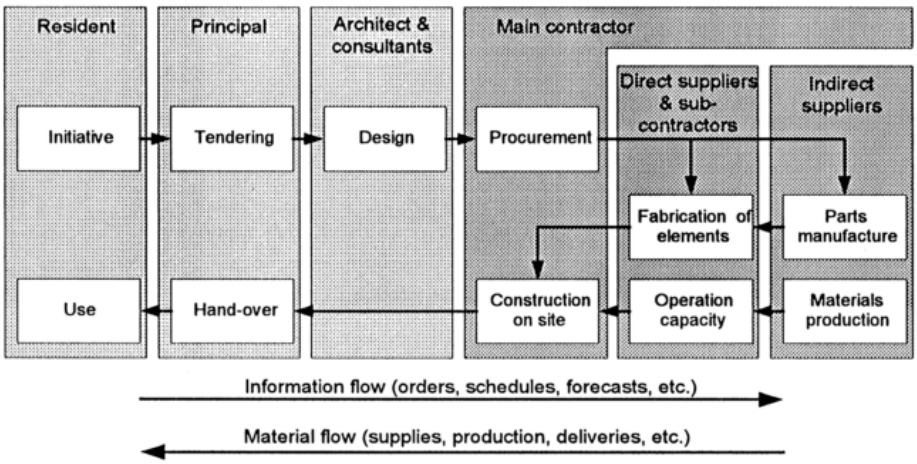

Figure 6: Typical construction supply chain (After; Verhoef & Koskela (2000, p.173))

Nowadays, public clients tend to use more integrated contracts for their projects. These contracts can take on different forms such as Design & Construct (D&C), Design, Build, Finance, Maintenance & Operate (DBFMO) or any other configuration with two or more of these components. Within these integrated contract forms, the situation described in Figure *6* changes. The more elements are added to the contract, the more integrated the supply chain becomes. For example, a design & construct contract integrates the consultant & architects block with the main contractor. Within this situation there are two options; the main contractor hires external professionals for the design or the main contractor has its own design department. In large projects, sub-contractors are often included in the design phase as well. Additionally, transferring the design to main contractors does not necessary mean that public clients not use consultants anymore. Many public clients use consultants and

[144] See Vrijhoef & Koskela (2000), p. 173.

architects to prepare the tender documents before publishing them. Based on the description above, the figure of Verhoef & Koskela (2000) is adapted to the current situation wherein main contractors form the interface between public clients and private sub-contractors and suppliers. The adapted figure is shown in Figure *7*.

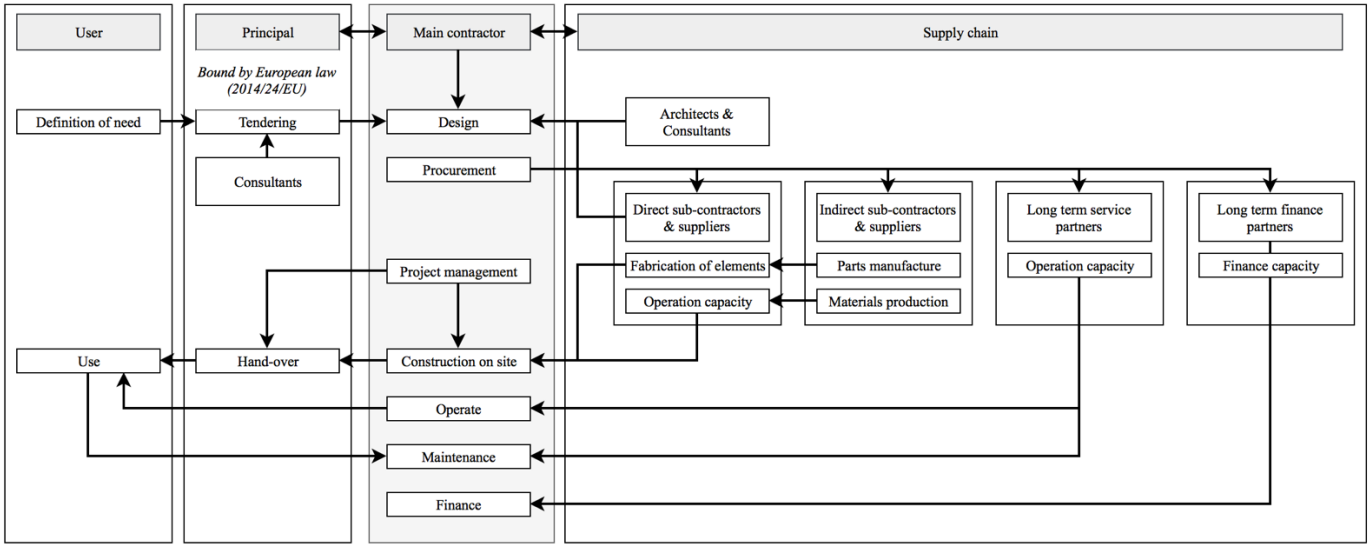

Figure 7: The managing contractor as interface.

Finally, the need & transaction uncertainty of the construction sector is heavily stimulated by the European tender regulations. For main contractors to remain profitable, many business components have been removed from the internal organization and bought externally. This reduces the overhead costs and therefore reduces the risk of having a workforce without work when a couple of tenders are lost.

Furthermore, sub-contractors and suppliers which are connected to several main contractors in a tender will almost always work with the main contractor who has won the tender. Therefore, the focus of this study is on the development of relations with the best sub-contractors and suppliers to ensure exclusivity of the supplier and increase performance on tenders by bundling resources and competences. Being an exclusive customer for a sub-contractor or supplier within a tender procedure is similar to being a preferred customer since there are many other main contractors competing for the best sub-contractors and suppliers. Other authors that have examined buyer-supplier relations, concluded that partnering is a means to obtain the best performance form the supply chain (e.g. the best sub-contractors).[145] It is therefore expected that both approaches are suitable for obtaining the best performance (performance information) from the supply chain.

[145] See among others; Ellram & Edis (1996), p. 26.; Wong (2000), p. 428.

5.2. The role of the managing contractor in the tender and execution phases; a new approach to operative excellence

The elaboration in the previous paragraph shows the role of a managing contractor within the current state of the industry and in the context of regulations and integrated contracts. One of the existing constructs (see paragraph 3.5) used in previous studies into supplier satisfaction is operative excellence. Related to this construct is the ability of customers to compose predictions about further demand. However, as elaborated before, the construction industry is characterised by need and transaction uncertainty because of strict tender regulations. Therefore, it is almost impossible for managing contractors to predict their demand towards sub-contractors and suppliers. Thus, to cover the operative excellence of managing contractors in their relation with sub-contractors, a new dimension is added to the measurement model. In general, the managing contractor is involved in two stages of a standard construction process. These stages are the tender phase and the execution phase. Within these two stages, various processes are of interest which may have an effect on the supplier satisfaction. The study of Matthews (1996) investigated the perspectives of sub-contractors on those processes.[146] He conducted a quantitative study into the most important aspects of a managing contractor from a supplier perspective. Based on the results from this questionnaire, two new constructs are developed which are shown in Table *4*. A distinction is made between tender processes and execution processes.

Table 4: Two new constructs for operative excellence.

Execution and site processes
Strukton/Reef…
...Is safety conscious at the construction site
...Pays variations promptly
Site staff has a cooperative attitude
...Properly notifies you of variations
...Coordinated activities between various sub-contractors in an efficient manner
Tender process
Strukton/Reef…
...Provides all necessary contract information on time
…The tender documents are comprehensive and clear in the allocation of responsibilities
...Timely involves your firm for the tender process
...Has sufficient knowledge about tender procedures to see it through
…Listens and treats your ideas and suggestions on a fair and transparent manner.

[146] See Matthews (1996), appendix 6.

6. The preferred customer status concept in the construction industry; examining the link between partnering and becoming a preferred customer

6.1. Using an existing framework to examine buyer-supplier relations in the construction sector

The step-by-step plan of Nollet et al. (2012) is used to examine the concept of preferred customer status in relation to existing knowledge about buyer-supplier relations in the construction sector.[147] (See Figure *8*)

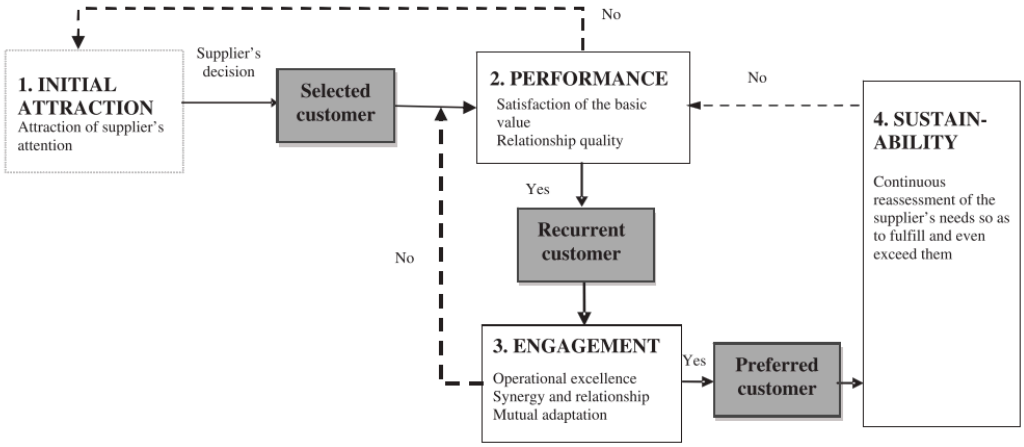

Figure 8: Becoming a preferred customer (Nollet et al. (2012, p.1188))

Based on the framework from Nollet et al. (2012), becoming a preferred customer is depending on the initial attraction of the managing contractor (step 1), the performance/supplier satisfaction (step 2), engagement/ investments for a continuing relation (step 3) and sustainability by reassessing and improving the relation (step 4). This chapter will use the presented framework to describe the relation between the concepts of preferred customer and existing knowledge about buyer-supplier, especially knowledge about partnerships. The following paragraphs are formatted as:

Step 1. Competition on supply chain level; ensuring exclusivity of strategic suppliers and sub-contractors.

Step 2. Satisfying suppliers through successful cooperation on a project.

Step 3. Become a preferred customer by increasing long-term commitment.

Step 4. Establishing joint objectives, mutual trust and effective communication to establish and sustain a strategic partnership.

[147] See Nollet et al. (2012), p.1188.

6.2. Step 1: Competition on supply chain level; ensuring exclusivity of strategic suppliers and sub-contractors

The concept of preferred customer is a rather new theoretical development in the construction sector. Prior to the reverse marketing approach, suppliers competed for the best buyers. The focal firm in that relation was therefore the buyer and many researchers defined portfolio approaches to define the most suitable supplier.[148] The selection process was concerned with finding appropriate suppliers, which are capable of delivering the right quality/price/quantity on the right time.[149] Because a construction contractor operates in a competitive environment, the selection and maintenance of a competent group of suppliers is essential.[150] The shift towards a focus on core-business activities in many firms increased attention on cooperation and partnering in the supply chain. Instead of competing on firm level, the understanding that the firm performance is heavily depending on the supply chain stimulated the competition on supply chain level.[151] Various industry characteristics, such as competitive tendering and increased outsourcing of managing contractors strengthens the need for a competition on supply chain level. This supply chain level competition led to the competition for best suppliers described by Dyer & Hatch (2006).[152] Figure *9* shows the visualisation of the new situation.

As shown in Figure *9*, suppliers are not often exclusive for one managing contractor. Moreover, the strong growth of the construction industry in the Netherlands from 2013-2014 onwards have led to increased power of sub-contractors and suppliers over managing contractors. This growth is expected to continue over at least the next year.[153] The best sub-contractors and suppliers are receiving many RFP/RFQ from managing contractors and thus have the power to choose with whom they are cooperating on a project. This situation is similar to the description provided by Nollet et al. (2012); the selection of customers is the suppliers decision. However, most managing contractors have long lasting relations with their standard suppliers for aspects like drainage, ground work etc., often longer than 10 years.[154] Therefore, the situation described in Figure *9* applies to the best specialist sub-

[148] See Kraljic (1983); Bensaou (1999); Bildsten (2014;)
[149] See Zhang, Zhang, Lai, & Lu (2009), p. 9557.
[150] See Weber, Current, & Benton (1991), p. 2.
[151] See Wong (2000), p. 428.; Koufteros, Vickery, & Dröge (2012), p. 93.
[152] See Dyer & Hatch (2006) p. 703.
[153] See CBS, EIB, Koophandel Kamer van, MKB Nederland, & VNO-NCW (2018)
[154] See Akintoye & Main (2007); Tan, Xue, & Cheung (2017), p. 2.

contractors and suppliers which have specific resources and capabilities needed for a project. These suppliers have the power to choose with whom they are cooperation on a tender. Hence, the award procedures of public tenders focus on distinctiveness of the proposal and thus cooperation with the best specialist suppliers can give an advantage in the tender procedure.[155] It is thus important that managing contractors define strategic product/service portfolios to examine the need to cooperate with certain specialist sub-contractors and suppliers to increase the performance on tenders. This is not part of the scope of this thesis and thus not further analysed.

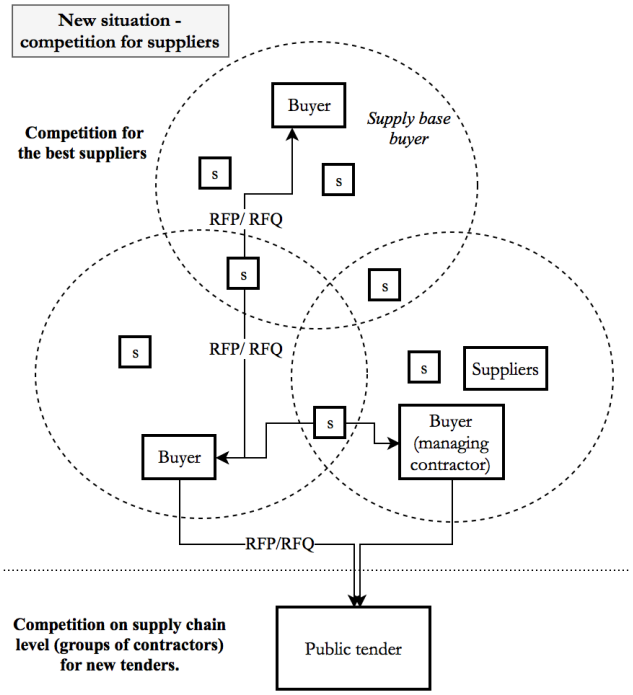

Figure 9: Competition on supply chain level.

6.3. Step 2: Satisfying suppliers through successful cooperation in a project

The second step in the framework entails the first interaction/ project which is executed in cooperation with sub-contractors and suppliers. The main purpose of this phase is to establish and maintain a proper level of performance through satisfaction and relational quality.[156] The level of cooperation in the construction industry be categorized according to four categories; adversarial, competitive, collaborative and partnering relationship.[157] Wong (2000) describes the positive influence of cooperation on satisfaction. He states that for companies to achieve supplier satisfaction, they must engage in a co-operative relationship and that the success of this co-operative relation depends upon the effective interaction

[155] See Narasimhan & Talluri (2009), p. 114.; Mortensen (2012), p. 1212.
[156] See Nollet et al. (2012), p. 1188.
[157] See Eriksson (2008), p. 104.; Tan et al. (2017), p. 2.

between the parties.[158] Additionally, other authors described co-operation as antecedent of supplier satisfaction as well.[159]

Cooperation in the construction supply chain is often referred to as partnering. Within the partnering literature, a distinction is made between project partnering and strategic partnering (see paragraph 4.3) and many researchers have focussed on the client-contractor relationship instead of the sub-contractor-managing contractor relationship.[160] But there is also recognition of the importance of down-stream integration within the construction supply chain.[161] Dainty et al. (2010) found that the adversarial practices and a lack of trust in each other are the main problems with establishing cooperation in the construction supply chain.[162] This conclusion is supported by various other studies.[163] The relationship history between two supply chain partners also has an impact of the decision to enter in a cooperative relation.[164] Thus, by moving away from adversarial practices and act as a reliable partner, the cooperation between supply chain partners can be increased. This is further stretched by Benton & Maloni (2005) who found that there is a strong link between supplier satisfaction and the nature of the relationship between supply chain partners, rather than there is a link between supplier satisfaction and performance.[165] These results support the notion from Nollet et al. (2012) that becoming a recurrent customer for sub-contractors depends on relational quality and supplier satisfaction (relationship history). The first hypotheses for this study are thus formulated as:

H1a. Relational behaviour of the main contractor has a positive impact on the supplier satisfaction in the construction sector.

H1b. The reliability of a main contractor has a positive impact on the supplier satisfaction in the construction industry.

Furthermore, the new construct of operative excellence in the construction sector described in paragraph 5.2. is also expected to have a positive effect on supplier satisfaction in the

[158] See Wong (2000), p. 429.
[159] See Maunu (2003), p. 43.; Hüttinger et al. (2012), p. 1189.
[160] See Dainty, Briscoe, & Millett (2001), p. 842.; Bygballe, Jahre, & Swärd (2010), p. 239.
[161] See Dainty, Briscoe, & Millett (2001); Gadde & Dubois (2010); Bygballe, Jahre, & Swärd (2010)
[162] See Dainty, Millett, Briscoe, & Millett (2010), p. 171.
[163] See Larson (1995), p. 35.; Humphreys et al. (2003) p. 176.
[164] See Crespin-Mazet, Havenvid, & Linné (2015), p. 12.
[165] See Benton & Maloni (2005) p. 17.

construction industry. This is based upon the fact that proper operational processes in relation to the cooperation with sub-contractors can increase the competitiveness of the managing contractor.[166] Additionally, formal processes which strengthen ties with sub-contractors are also considered to improve the productivity of managing contractors since the expertise of the sub-contractors is used to formulate tender documents.[167] Thus, operative excellence can increase the amount of work directed towards sub-contractors. The third hypothesis is therefore:

H1c. Operative excellence in tender & execution processes has a positive impact on supplier satisfaction.

6.4. Step 3: Become a preferred customer by increasing long-term commitment

The third step of the framework entails the engagement between two supply chain partners by increasing synergies, operative excellence and mutual adaptations. One of the main constraints to increase longer-term engagement from sub-contractors is the relative purchasing volume bought by managing contractors compared to the total sale volume of sub-contractors.[168] Furthermore, Havenvid et al. (2017) state that the value of resources bought from sub-contractors has an influence on long-term engagement from sub-contractors in the construction industry.[169] In addition, the results from Bemelmans et al. (2015) show that the annual spend of a contractor has a positive impact on the preferred customer status in construction.[170] The fourth hypothesis of this study is therefore:

H2a. Growth opportunities for sub-contractors and suppliers has a positive impact on preferred customer status.

Furthermore, the shift towards a competition on supply chain level emphasises the need for the best suppliers to stay competitive. The increased outsourcing of towards sub-contractors and suppliers increased the knowledge which is present in the supply chain. And simultaneously increasing the need for managing contractors to involve suppliers in their

[166] See Tan et al. (2017), p. 5.
[167] See Fulford & Standing (2014), p. 324.
[168] See Frödell (2009), p. 24.;
[169] See Havenvid, Holmen, Linné, & Pedersen (2017), p. 226.
[170] See Bemelmans et al. (2015), p. 195.

tender process to fully reap the benefits of their supply chain.[171] This in turn, increases the chances of winning tenders and thus has the possibility to increases the purchasing volume for sub-contractors. Additionally, as described by Nollet et al. (2012) mutual adaptations are critical in the engagement step of the framework.[172] This is supported by Dubois & Gadde (2010) which state that for a high involvement relation to exist, mutual adaptations are a necessary condition.[173] Hence, to facilitate these mutual adaptations and create synergies within the relation, involvement of suppliers is a necessary condition. In addition, achieving synergies with supply chain partners is expected to increase commitment from those partners.[174] Thus, based on the assumption that increased involvement of suppliers will increase the chances of winning tenders and that involving suppliers will increase their commitment, the fifth hypothesis of this study is formulated as:

H2b. Involvement of suppliers has a positive impact on preferred customer status.

Furthermore, a link exists between supplier development and supplier commitment.[175] Also, a link exists between relation specific investments and preferred customer status in the construction sector.[176] It is thus expected that investments in the relationship from a managing contractor perspective to have a positive influence on preferred customer status. Within the framework of this study, the support of suppliers (development) is expected to result in investments (time and personnel) and thus, the sixth hypothesis is formulated as:

H2c. Support of suppliers has a positive impact on preferred customer status in the construction sector.

Lastly, supplier satisfaction can also have a positive effect on the commitment of suppliers.[177] The results from Vos et al. (2016) show that supplier satisfaction has a positive impact on preferred customer status. Hence, the seventh hypothesis is formulated as:

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[171] See Black et al. (2000), p. 429.
[172] See Nollet et al. (2012), p. 1188.
[173] See Gadde & Dubois (2010), p. 258.
[174] See Nollet et al. (2012), p. 1190.
[175] See Essig & Amann (2009); Nollet et al. (2012), p. 1190.
[176] See Bemelmans et al. (2015), p. 191.
[177] See Essig & Amann (2009), p. 103.

H2d. Supplier satisfaction has a positive impact on preferred customer status in the construction industry.

6.5. Step 4: Establishing joint objectives, mutual trust and effective communication to sustain and develop the strategic partnership

The final step of the framework includes the aspect of sustaining the relationship. Nollet at al. (2012) describe this step as a continuous reassessment of the suppliers needs to fulfil and even exceed them.[178] On their turn, suppliers constantly re-evaluate the performance of their buyer and determine resource allocation accordingly.[179]

By becoming a preferred customer, theory implies that preferential resource allocation will be directed towards the preferred customer.[180] From both perspectives (e.g. buyer & supplier), obtaining the preferred customer status for only one project is not assumed to be efficient since the benefits connected to preferred customer status are not associated with a single project.[181] The development and maintenance of a long-term relation (partnership) with a supplier is therefore needed to reap the full benefits of the preferred customer status. In addition, the performance information becomes of higher quality when it is collected over several projects.

As already implied in the previous paragraph, it is expected that increasing growth opportunities, supplier satisfaction, support of suppliers and involvement of suppliers will increase the chances to become a preferred customer. However, to sustain a partnership, several other aspects are of interest. As described in paragraph 4.3, many authors have done research into the critical success factors of partnering in the construction industry, mostly focussing on long-term partnerships (e.g. strategic partnerships).[182] A review of all these studies in relation to supplier satisfaction has revealed a, non-exhaustive, list of the most important success factors of partnering, this list is shown in Table *5*. Since no prioritization is present of these CSF, this part of the study will focus on determining the ranking of the

[178] See Nollet et al. (2012), p.1190.
[179] See Lindwall, Ellmo, Rehme, & Kowalkowski (2010), p. 5.
[180] See Vos et al. (2016), p. 4620.
[181] See Nollet et al. (2012), p. 1187.
[182] See Larson (1997), p. 192.; Black et al. (2000), p. 429.; Cheng & Li (2002), p. 200.; Chan et al. (2004), p. 195.; Kim & Nguyen (2018), p. 176.

defined CFS's. Literature will be used to determine the three most important criteria from the list in Table *5* for successful long-term cooperation in the construction sector.

Table 5: Critical success factors for partnering.

Critical success factors for partnering in the construction industry
Mutual trust between client and supplier
Alignment of goals and objectives.
Actions consistent with objectives & partnering goals.
Level and quality of communication (open & effective) form the client.
Business attitude of the client.
Commitment to win-win and fair allocation of profits.
Provisions & commitment to continuous improvement.
Working relationship
Clear understanding and coordination of roles, responsibilities & tasks.
Flexible with regard to changes.
Dedicated team from the client
Team building between client and supplier.
Conflict identification & resolution
Quality of agreements between client and supplier.

Yueng et al. (2007) and Hald et al. (2009) states that effective communication is essential to maintain a relationship.[183] Furthermore, effective communication is also expected to foster growth opportunities since areas for improvement are identified and fail costs are reduced.[184] It is thus expected that effective communication is in the top 3 of most important success factors from a supplier's point of view, resulting in the eighth hypothesis of this study.

H3a. Effective communication is in the top 3 most important success factors for maintaining a relationship within the construction sector.

Furthermore, the construction sector is often characterised by adversarial relations and mistrust.[185] Dainty et al. (2001) found that mistrust often acts as a fundamental barrier to further supply chain integration[186] and additionally, supply chain risk increases when relations are characterized by mistrust.[187] These conclusions are supported by a wide variety of literature.[188] Additionally, the studies of Black et al. (2010) & Tan et al. (2017) show that

[183] See Yeung, Chan, & Chan (2007), p. 230.; Hald et al. (2009), p. 968.
[184] See Eom, Yun, & Paek (2008), p. 849.; Hu (2008)
[185] See Dainty, Briscoe, & Millett (2001), p. 841.
[186] See Dainty et al. (2001), p. 846.
[187] See Pal, Wang, & Liang (2017), p. 1228.
[188] See Larson (1995), p. 30.; Bygballe et al. (2010), p. 246.; Crespin-Mazet & Portier (2010), p. 237.; Eriksson (2010), p. 906.; Hosseini, Abebe, & Bellini (2016), p. 244.

mutual trust is the most important factor in partnerships.[189] Therefore, mutual trust is seen as a top 3 critical success factor for maintaining relationships in the construction industry.

H3b. Mutual trust is in the top 3 most important success factors for maintaining a relationship within the construction sector.

The last CFS that will be treated here is the alignment of goals and objectives. Nollet et al. (2012) propose the active evaluation of the suppliers needs to set objectives as a tactic to stay a preferred customer.[190] Furthermore, Erikson (2010) differentiates between core elements of partnering and optional elements of partnering. Joint objectives are one of the core elements and thus considered to be critical to success.[191] Moreover, joint objectives and common goals can also be used as a tool to assure benefits for both parties involved in a relationship.[192] Based on these studies, it is expected that the alignment of goals & objectives is in the top 3 critical success factors in the construction industry.

H3c. The alignment of goals and objectives is in the top 3 most important success factors for maintaining a relationship within the construction sector.

6.6. The link between the preferred customer concept and partnering in the construction industry

In conclusion, it is argued that for the obtainment of preferential treatment from suppliers, the supplier must first be attracted to the buyer (step 1). When attraction is present, a minimum level of satisfaction is needed to become a recurrent customer for that specific supplier (step 2). This can be achieved by implementing a successful project partnering approach. Further increase of supplier satisfaction and the implementation of mutual adaptations (synergies) is needed to become a preferred customer (step 3). The last step consists of a sustainable approach for establishing and maintaining the partnership. Several critical success factors of partnering are argued to be essential in this phase (step 4). The prior study of Vos et al. (2016) shows that there is a relation between being a preferred

[189] See Black et al. (2000), p. 426.; Tan et al. (2017), p. 7.
[190] See Nollet et al. (2012), p. 1192.
[191] See Eriksson (2010), p. 915.
[192] See Bygballe et al. (2010), p. 245.

customer and receiving preferential treatment.[193] Additionally, implementing these CSF's is expected to increase the success of the partnership for both sides (better supplier intention) and therefore possibly trigger preferential treatment (supplier behaviour) from strategic partners. The final hypothesis therefore:

H3d. Obtaining a preferred customer status has a positive impact on the preferential resource allocation from suppliers.

An overview of the hypotheses is shown in Figure *10*. Additionally, since this one of the first empirical researches into the antecedents of supplier satisfaction and preferred customer status in the construction sector, other hypothesis which are not discussed above will also be calculated. This will enable the researcher to draw accurate conclusions form the entire dataset in addition to the expected outcomes derived from the available literature.

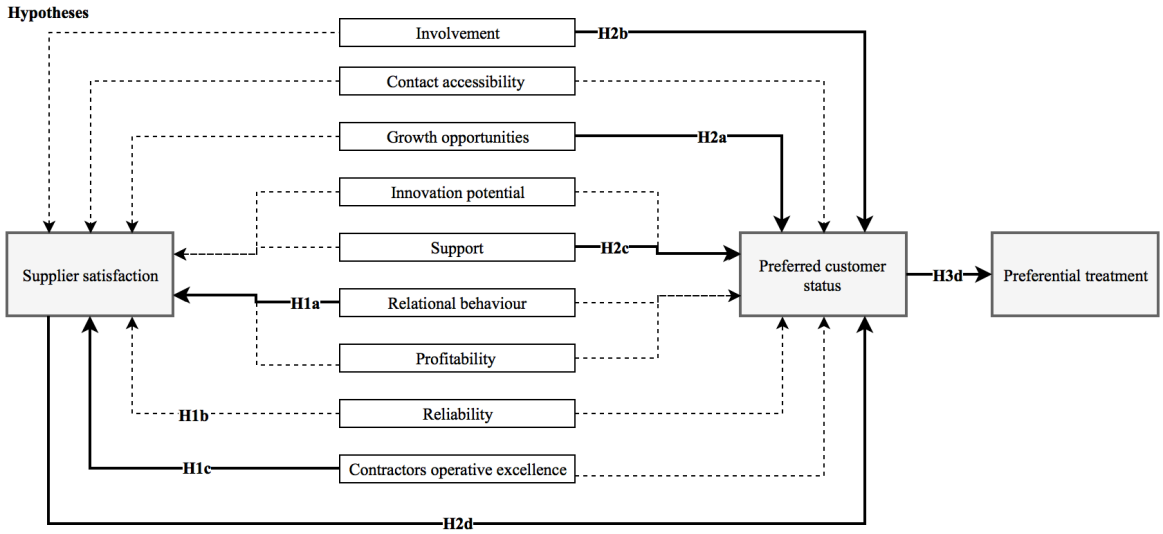

Figure 10: Hypotheses for this thesis.

[193] See Vos et al. (2016), p. 4618.

7. Methodology

7.1. The company outline of Strukton; a managing construction contractor with several areas of expertise

In 1918, the Dutch railway company needed a new head office in Utrecht. Instead of contracting an external party to build this new building, the Dutch railway company decided to build it by themselves. This marks the birth of the rail construction LLC. In 1952, this company relocates their head office from Utrecht to Maarssen. In 1972 the rail construction LLC is merged with a Danish construction company and in 1974, the Strukton group is formed. After this merger, several regional and nation-wide companies are acquired expanding the business from rail only towards more integrated construction projects and office exploitation. In 2010, Strukton group is bought by Oranjewoud LLC and brought to the stock exchange. Nowadays, the Strukton Group operates in three main markets; rail systems and infrastructure, Civil construction projects and technical installations in buildings. These three markets are served by five main work companies; (1) Strukton Rail, (2) Strukton Civil, (3) Strukton Worksphere, (4) Strukton integrated projects, (5) Strukton international. Together with their partners, the Strukton group constructed several of the big projects in the Netherlands and abroad. Some examples are the double-layered tunnel in Maastricht (Avenue A2), the A15 (A-lanes A15) in the Rotterdam harbour and the $6 billion-dollar Metro Riyad project. The total revenue of the Strukton group over 2017 was €1,917 billion euro with an operating profit of €76 million euro. The total order backlog is over €3 billion euro.[194]

The focus of this research lies within the work company of Strukton Civil. The core business for Strukton Civil is managing integrated civil construction projects in design, execution, exploitation and maintenance.[195] This is a market where there is fierce competition for projects. Especially public commissioned projects are subject to a fierce competition between market parties in the civil construction due to an overcapacity of the market and the EU procurement law.[196]

[194] See Strukton (2017), p. 4-5.
[195] See Strukton (2017), p. 16.
[196] See https://www.cobouw.nl/infra/nieuws/2017/03/duikgedrag-verschuift-naar-kleinere-gww-projecten-10155213

7.2. Survey design and indicators used

The survey that is used in this research is not specifically designed for this research. The questionnaire originates form the studies of Hüttinger et al., (2014) & Vos et al. (2016). The questionnaire consisted of 82 questions regarding the basic dimensions of supplier satisfaction, preferred customer status and preferential treatment. Next to the 2 new constructs in this survey, the question about critical success factors was added. In total, 14 critical success factors are added. The respondents are asked to rate them on a Likert scale from 1 to 5 based on the impact the CSF's have on their satisfaction.

7.3. Sample characteristics and data collection methods

The data for this study was collected through an online survey in collaboration with the case company. The sample was based upon data from the purchasing department from Strukton civil projects and the three regions of Strukton Civil from 2016 and 2017. In total 6033 suppliers and sub-contractors were present in the data (including duplicates). To select the sample, four criteria were used; (1) the total purchasing volume in 2016 or 2017 should be above 10k, (2) the company is not an internal company of the Strukton Group, (3) it is a Dutch company and (4) products or services they provided are relevant for civil construction projects. After applying these criteria to the invoice data, 781 unique suppliers and sub-contractors were selected. Of all these suppliers and sub-contractors, the email addresses which were not yet known to the researcher were looked up.

The first round of emails was sent on the 2nd of March 2018. This concerned a group of 113 suppliers of the Strukton Civil group. The objective of this was to check whether the suppliers and sub-contractors were willing to fill in the survey and to check if the time was sufficient. This first round only yielded 3 responses in 1 week. After contacting one supplier which did not fill in the survey, the general concern was the proposed time (15 minutes). Based on this concern and the fact that only 3 responses were collected, the survey was shortened (5-10 minutes). The first round of survey included comparisons with the best customer of the sample companies. This was asked for 60 questions and therefore considerably increased the time needed to finish the survey. These comparisons were eliminated in the shorter version of the survey.

The second round of surveys were distributed on the 13th of March towards the remaining 668 suppliers and subcontractors. After the first two weeks a reminder was send. Another

two weeks later, the second reminder was sent. Before the second reminder, 52 responses were collected. To increase the response rate, the companies were contacted by telephone. In total, 121 companies were contacted by telephone. The selection of companies which were called was based on the height of the turnover. General comments which were received by telephone was that there was no time to fill in a survey or that they do not work with Strukton Civil anymore. Only 12 companies filled in the survey after the researcher called. Another 18 responses were collected after the second reminder. Based on this low compliance, the researcher decided to stop collecting data and execute further analysis with the 82 collected responses. The last response was collected on the 17th of April. The total response rate is 10.5% which is slightly lower than the average response rate of 15-25%.[197] The general characteristics of the sample are shown in *Table 6*.

Table 6: Sample characteristics.

Sample characteristics	
Total number of suppliers	6033
Total sample (above 10k)	781
Started survey	186
Completed survey	82
Drop-out rate	56%
Response rate	10.5%

The characteristics of the sample (Table *8*) shows that 72% of the respondent's companies have a relation with Strukton for longer than 5 years and that more than 90% of the respondents worked with Strukton for over 1 year. Furthermore, the invoice data allowed the researcher to find the turnovers of specific suppliers for 66 of the 82 respondents which is shown in Table *7*.

Table 7: Turnover characteristics.

Turnover characteristics of the respondents (n=82)	
Between 10 – 50 k	20
Between 50 – 100 k	15
Between 100 – 250 k	16
Between 250 – 500 k	9
Between 500 – 750 k	4
>750k	2
Unknown	16

[197] See Vos et al. (2016), p. 4616.

Table 8: Respondents characteristics.

Characteristic	Category	Amount (n=82)	Percentage
Length of relation between Strukton and respondents' company.	<5 years	14	17,07 %
	5-10 years	28	34,15 %
	11-20 years	16	19,51 %
	>20 years	15	18,29 %
	Unknown	9	10,98 %
Number of employees at respondent's company.	<10 employees	15	18,29 %
	10-50 employees	40	48,78 %
	51-250 employees	18	21,95 %
	251-1000 employees	6	7,32 %
	>1000 employees	1	1,22 %
	Unknown	2	2,44 %
Sector of respondent's company.	Primary	18	21,95 %
	Secondary	16	19,51 %
	Tertiary	46	56,10 %
	Quaternary	2	2,44 %
Length of respondent as sales representative.	<1 year	1	1,22 %
	1-5 years	15	18,29 %
	5-10 years	10	12,20 %
	10-20 years	25	30,49%
	>20 years	28	34,15 %
	Unknown	3	3,66 %
Length of respondent's involvement in relationship with Strukton.	<1 year	1	1,22 %
	1-5 years	23	28,05 %
	5-10 years	17	20,73 %
	10-20 years	25	30,49 %
	>20 years	9	10,98 %
	Unknown	7	8,54 %

7.4. Assessment of the data; Factor analysis with SPSS and a Partial least squares analysis with SmartPLS 3.0

The statistical method that will be used is related to multivariate statistical analysis. Multivariate analysis is used to analyse multiple variables simultaneously.[198] Within the multivariate statistical techniques there are two main streams; exploratory and confirmatory analysis. The objective of exploratory multivariate techniques is to analyse possible relations between latent variables without a priori knowledge about these relations. Confirmatory

[198] See Hair, Hult, Ringle, & Sarstedt (2014), p. 2.

analysis is used to test hypothesis based on existing concepts or theories.[199] For this study both approaches will be used. Since the questionnaire and the model are already applied multiple times, confirmatory analysis is considered appropriate to check the applicability of the constructed model in the construction industry (see Appendix E).[200] However, since the model has not yet been applied in the construction industry, assumptions and theoretical considerations applied in prior research may change due to the different environment. For that reason, an exploratory analysis is also conducted including two new variables to see whether there are changes as a result of the change in industries (see chapter 8).

The multivariate method that will be used is the Partial least squares method.[201] The PLS method is a variance based structural equation model. The reason to use PLS for this research is based upon several characteristics of this method. Firstly, as is described by Reinartz, Haenlein, & Henseler (2009), PLS is more powerful for sample sizes of N<250 than covariance based SEM. Additionally, Reinartz et al. (2009) also state that PLS is preferred when the focus is on prediction and theory development.[202] Next to this argument, the conceptual model of the research calls for a method that is able to deal with endogenous and exogenous variables. PLS allows this type of variables in the model.[203] The needed sample size is a result of the number of structural paths that lead to endogenous variables.[204] With a sample size of 82, this criterion is achieved. Furthermore, Henseler & Sarstedt (2013) state two other advantages of using PLS analysis: (1) PLS uses no assumptions about populations or scales and (2) PLS can be used with small sample sizes since OLS regression is used to estimate focal path relations.[205]

The first step will consist of an analysis of the data in IBM SPSS (version 22). The descriptive statistics (mean, SD, variance, skewness & Kurtosis) are calculated first (see Appendix B). Afterwards, a factor analysis is conducted using orthogonal and oblige rotations to assess the data (exploratory). In total, two exploratory factor analyses are conducted. The first exploratory factor analysis (model 1) examines the constructs supplier

[199] See Hair et al. (2014), p. 3.
[200] See Hüttinger et al. (2014); Pulles et al. (2016); Vos et al. (2016)
[201] See Ringe et al. (2015)
[202] See Reinartz et al. (2009), p. 332.
[203] See Pulles, Schiele, Veldman, & Huttinger (2016), p. 136.
[204] See Howell & Shea (2001), p. 22.
[205] See Fornell & Bookstein (1982), p. 433.; Henseler & Sarstedt (2013), p. 566.

satisfaction and preferred customer status as dependent variables and all existing constructs as independent variables (see paragraph 8.1). The second exploratory analysis (model 2) is used to explore the new construct in relation to supplier satisfaction and preferred customer status (see paragraph 8.2). All factor analyses are shown in the respective appendices. The second step is to assess the existing model with SmartPLS.[206] Each of the separate indicators (measurement model) which was used in prior studies will be added to the correct latent variables (structural model) in SmartPLS. By doing so, the confirmatory part of the research will be conducted (see Appendix E). Several validity and reliability requirements will be applied to account for discriminant and convergent validly & reliability. The thresholds of the quality criteria and other parameters that are used, are shown in Table *9*.

Table 9: Parameter settings SmartPLS 3.0.

Quality criteria and parameter settings[207]		
Quality criteria	Composite reliability (CR)	>0,7
	Convergent validity (AVE)	>0,5
	T – value	>1,96 (95% significance)
	HTMT	<.85
	VIF	<5
	SRMR (model fit)	<0.1 (<0,08 is considered a good fit)
Parameter settings (SmartPLS 3.0)	PLs-consistent procedure	Path weighting scheme 300 iterations
	Bootstrapping procedure	Individual sign changes Complete bootstrapping 5000 subsamples Bias corrected and accelerated. Two-tailed (0.05)

[206] See Ringe, Wende, & Becker (2015)
[207] See Hu & Bentler (1999), p. 1.; Henseler, Ringle, & Sinkovics (2009), p. 307.; Hair et al. (2014), p. 107, p. 138.

8. Exploratory analysis to discover the antecedents of supplier satisfaction and preferred customer status in the construction sector

8.1. Exploring the basic dimensions of supplier satisfaction and preferred customer status in the construction sector (model 1)

8.1.1. Using varimax rotations in SPSS to define an appropriate measurement model

The first step in exploring the patterns in the data consists of executing a factor analysis in SPSS.[208] An exploratory factor analysis (principal component) with varimax and oblige rotations is used to obtain the best possible factor solution. Executing the factor analysis with all constructs resulted in poor factors, especially for operative excellence. This construct loads to none of the factors in SPSS. It is therefore decided to leave operative excellence out of the analysis. Further analysis with the remaining constructs resulted in acceptable factors which is shown in Appendix C. Within this factor analysis, the constructs support and involvement load into the same factor. It is decided to retain this factor and merge support and involvement. Further explanation of this is presented in paragraph 10.1.

Running the bootstrapping procedure in SmartPLS results in the confidence intervals for each of the quality criteria. The assessment of these results shows that none of the lower confidence intervals (2.5%) shows signs of values dropping below the respective thresholds of the criteria (lowest AVE is .524, lowest CR is .832 and lowest cr. alpha is .719). Next to the loadings and quality criteria (internal consistency, indicator reliability and convergent validity) of the measurement model, the discriminant validity of the model needs to be assessed.[209] A new method for analysing the discriminant validity is proposed by Henseler, Ringle, & Sarstedt (2015).[210] Instead of assessing the Fornell-Larcker criterion[211] and the cross-loadings, the heterotrait- monotrait ratio of correlations (HTMT) is assessed. Henseler et al. (2015) propose a threshold value of .85 for conservative assessment of the discriminant validity.[212] The PLSc algorithm shows that all HTMT are below the conservative threshold value of .85 (the highest HTMT is .722). Running the Bootstrapping procedure yields the confidence intervals for the HTMT. This shows that the upper confidence interval (97.5%)

[208] IBM SPSS version 22.0.0.1
[209] See Hair et al. (2014), p. 107.
[210] See Henseler et al. (2015)
[211] See Fornell & Larcker (1981)
[212] See Henseler et al. (2015), p. 129.

of the HTMT is above the threshold of .85 in one case (highest is .859). This implies that the discriminant validity is not present for the most conservative criterion. However, a less conservative threshold of .9 also acceptable in a vast majority of the cases to detect discriminant validity and for smaller sample sizes even a threshold of 1 is able to detect issues with discriminant validity.[213] Furthermore, the cross-loadings show that all items have the highest loading on the construct it is linked to, which is also an indication of discriminant validity.[214] Therefore, discriminant validity is assumed to be no issue in the measurement model. The results from the bootstrapping procedure are also shown in Appendix C.

8.1.1. Evaluation of the structural model

The structural model related to the measurement model in paragraph 8.1.1 is discussed in this paragraph. The evaluation is based upon a bootstrapping and blindfolding procedure in SmartPLS 3.0.[215]

The first step is to assess the inner VIF values. The highest inner VIF value between predictor constructs in the structural model is 3.766 and thus below the threshold of 5.[216] The second step entails the assessment of the path coefficients in the structural model. *Table 10* shows the path coefficients, the significance of those coefficients and the effect size. For profitability and support/involvement, some values are negative. This is due to high indicator correlations. To assure the correct positive or negative conclusion, an additional OLS regression analysis is conducted in SPSS (see paragraph 8.5 & Appendix C.VI). This analysis shows similar path coefficients to the ones reported in *Table 10* however, these are positive. It is thus expected that the indicator correlations influenced the calculations in SmartPLS and that the path coefficients in Table *10* are all positive based on the SPSS calculations. This is due to the fact that the indicator correlations do not influence the calculation in SPSS since the factors are retained independently before the calculation.

Table 10: Path coefficients model 1.

Path coefficients and significance (two-tailed & α = .05)	Path coefficient	P Values	Effect sizes f^2
Contact accessibility -> Preferred customer	0,059	0,389	0,005
Contact accessibility -> Supplier satisfaction	0,150	0,066	0,032
Growth opportunities -> Preferred customer	0,404	0,004	0,169
Growth opportunities -> Supplier satisfaction	0,160	0,154	0,029

[213] See Henseler et al. (2015), p. 129.
[214] See Hair et al. (2014), p. 105.
[215] See Hair et al. (2014), p. 97.
[216] See Hair et al. (2014), p. 170.

Innovation potential -> Preferred customer	0,300	0,011	0,092
Innovation potential -> Supplier satisfaction	0,009	0,899	0,000
Profitability -> Preferred customer	(-)0,040	0,619	0,002
Profitability -> Supplier satisfaction	0,022	0,778	0,001
Relational behaviour -> Preferred customer	0,057	0,517	0,003
Relational behaviour -> Supplier satisfaction	0,397	0,002	0,152
Reliability -> Preferred customer	0,162	0,139	0,030
Reliability -> Supplier satisfaction	0,072	0,318	0,006
Supplier satisfaction -> Preferred customer	0,239	0,037	0,054
Support/involve -> Preferred customer	(-)0,303	0,032	0,066
Support/involve -> Supplier satisfaction	0,134	0,286	0,014

For assessing the predictive relevance of the model, the R^2 is assessed together with the effect size f^2 and the Stone-Geiser Q^2.[217] Both measures for predictive relevance show that the model has predictive power (R^2>0.2 and Q^2>0). For the effect sizes f^2, the effects can be categorized as small (0.02), medium (0.15) and large (0.35).[218] Furthermore, the Stone-Geiser Q^2 should be well above 0.[219] The fourth step is to assess the fit indices of the model. The most commonly used fit index is the square root mean square residual (SRMR) with a cut-of value of 1. Additionally, the SRMR value should be below the upper confidence interval.[220] For this model, the SRMR is equal to .08 and thus well below the threshold.[221] However, the SRMR is above the upper confidence interval (.079) implying a poor fit. The RMSEA is not usable in models with a small sample size and thus left out of the analysis.[222] The last fit measures used are the exact fit criteria Geodesic distance and Euclidian distance.[223] For the Euclidian distance the value is above the upper confidence interval showing poor fit however, the Geodesic distance shows proper fit and is below the upper confidence interval as is shown in Table *11*.

Table 11: Model fit criteria model 1.

Model fit criteria	SRMR		D_Uls		D_g1		D_g2	
	Value	CI (97.5%)	Value	CI (97.5%)	Value	CI (97.5%)	Value	CI (97.5%)
Model 1	0.080	0.079	5.558	5.402	5.884	13.103	4.394	9.832

[217] See Geisser (1974); Hair et al. (2014), p. 175-178.
[218] See Hair et al. (2014) p. 184.
[219] See Henseler, Ringle, & Sinkovics (2009), p. 303.
[220] See Vos et al. (2016) p. 4618.
[221] See Hu & Bentler (1999) p. 28.
[222] See Hu & Bentler (1999), p. 28.
[223] See Dijkstra & Henseler (2015)

Based on the analysis of the measurement and structural model, it can be concluded that the overall structural model shows a mediocre fit. However, the measurement model shows proper predictive relevance and validity & reliability. The results of the analysis are shown in Figure *11*. The results from the OLS regression calculation in SPSS are shown in Appendix C.VI.

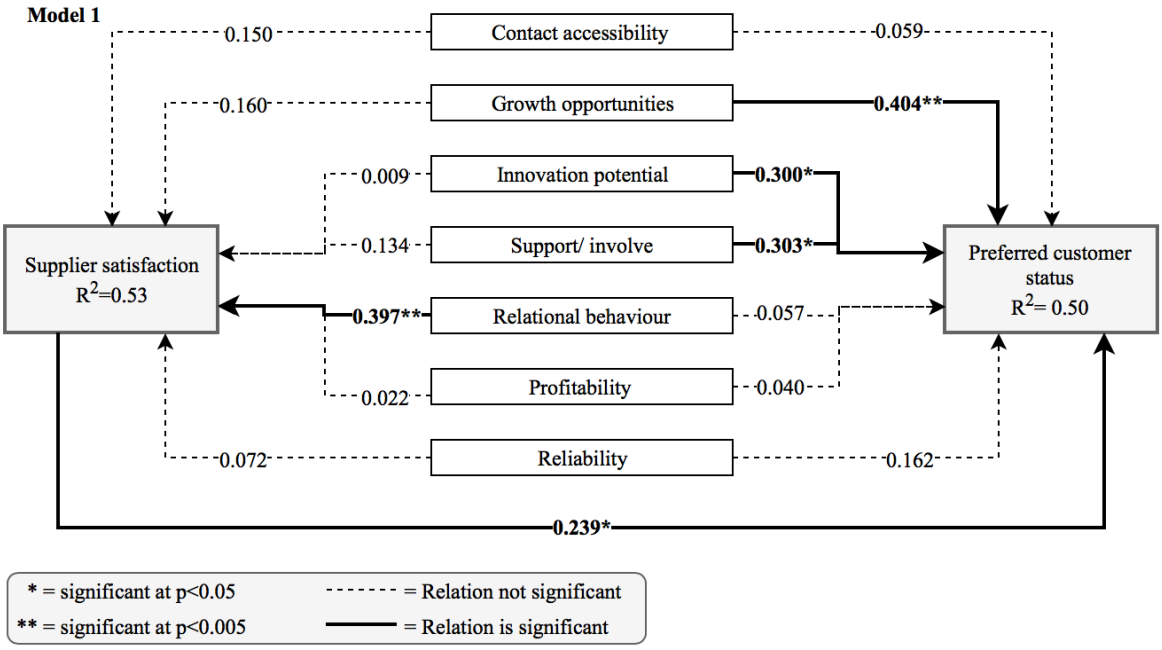

Figure 11: Results of model 1.

8.2. The effect of contractor's operative excellence on supplier satisfaction and preferred customer status in the construction sector (model 2)

8.2.1. Using principal component analysis to assess validity of the new constructs in relation to the existing constructs

The model presented in this paragraph will elaborate on the effect of the new constructs on the standard model described in paragraph 8.1. For this analysis, the new constructs operative excellence in execution and operative excellence in tender are analysed in SPSS. The factor analysis is shown in Appendix D. Similar to the previous factor analysis, operative excellence loads to none of the factors and support and involvement load into the same factor. Furthermore, the new constructs which are defined, also load into the same factor. Both execution and tender operative excellence load on factor 1. Since these two constructs represent most of the business processes of managing contractors, the construct is merged and renamed to *contractor's operative excellence.* All result from the bootstrap procedure are shown in Appendix D. The next step is to evaluate the quality criteria for structural equation models using a bootstrap procedure. Firstly, an assessment is made to

check whether the lower confidence intervals of the quality criteria are lower than the defined thresholds. None of the lower confidence intervals in one of the three models shows a violation of this rule and thus convergent validity, internal consistency and indicator reliability is achieved for each of the models. Secondly, the discriminant validity needs to be assessed.[224] Similar as in 8.1.1, the HTMT is used to assess discriminant validity with a conservative threshold of .85.[225] Only two values show a violation of the threshold (.856 & .883) for their upper confidence interval (97.5%). For both values, the cross-loadings are examined and they show no problematic cross-loadings (e.g. the loading is the highest on the factor it is supposed to measure) and thus discriminant validity is achieved for the model.[226]

8.2.2. Evaluation of the structural model

This paragraph will present an evaluation of the structural model. Table *12* shows the path coefficients, p-values and effect sizes for the relations in the structural model. Additionally, the indirect effect of the new construct on preferred customer status is also calculated. This show that the indirect effect is equal to 0.106 with a p-value of 0.052. This means that the indirect effect of contractor's operative excellence -> supplier satisfaction -> preferred customer status is not significant within this sample. Moreover, as shown in Table *12*, some path coefficients are negative. This is due to high indicator correlations. These relations are checked in SPSS and similar as in the previous paragraph (see paragraph 8.1.1, 8.5 and Appendix D.IV), the path coefficients in SPSS are positive and thus the relations are expected to be positive since the indicator correlations influenced the calculations in SmartPLS (also see paragraph 8.1).

[224] See Hair et al. (2014), p. 107.
[225] See Henseler et al. (2015), p. 129.
[226] See Hair et al. (2014), p. 105.

Table 12: Path coefficients model 2.

Path coefficients and significance (two-tailed & α = .05)	Path coefficient	P Values	Effect sizes (f^2)
Contact accessibility -> Preferred customer status	0,072	0,292	0,007
Contact accessibility -> Supplier satisfaction	0,159	0,051	0,041
Contractors operative excellence -> Preferred customer status	(-)0,218	0,115	0,043
Contractors operative excellence -> Supplier satisfaction	0,334	0,001	0,128
Growth opportunities -> Preferred customer status	0,428	0,001	0,193
Growth opportunities -> Supplier satisfaction	0,111	0,275	0,015
Innovation potential -> Preferred customer status	0,259	0,024	0,068
Innovation potential -> Supplier satisfaction	0,085	0,265	0,008
Profitability -> Preferred customer status	(-)0,055	0,541	0,003
Profitability -> Supplier satisfaction	0,054	0,547	0,003
Relational behaviour -> Preferred customer status	0,118	0,248	0,011
Relational behaviour -> Supplier satisfaction	0,182	0,055	0,031
Reliability -> Preferred customer status	0,170	0,106	0,034
Reliability -> Supplier satisfaction	0,083	0,238	0,009
Supplier satisfaction -> Preferred customer status	0,317	0,009	0,089
Support/involve -> Preferred customer status	(-)0,245	0,093	0,043
Support/involve -> Supplier satisfaction	0,009	0,929	0,000

The next step is to assess the predicative relevance of the model. This is done by calculating the R^2 and the Stone-Geiser Q^2.[227] Both measures show that the model has sufficient predictive relevance (R^2>0.2 and Q^2>0). [228] The last step is to assess the fit indices of the model. Table *13* shows the fit indices of the model. Similar as the model is the previous paragraph, the SRMR value is above the 97.5% confidence interval implying a poor fit. The Euclidian distance also shows a violation of this threshold. Concluding, the SRMR is below the cut-of value of 1 but the value is not in the 5% confidence interval and thus, also this model has a mediocre fit.

Table 13: Model fit criteria for model 2.

Model fit criteria	SRMR		D_Uls		D_g1		D_g2	
	Value	CI (97.5%)	Value	CI (97.5%)	Value	CI (97.5%)	Value	CI (97.5%)
Model 2	0.083	0.079	7.497	6.826	7.732	133.145	5.915	N/a

The results of the analysis are shown in Figure *12*. The results from the OLS regression calculation in SPSS are shown in Appendix D.VI

[227] See Geisser (1974); Hair et al. (2014), p. 175-178.
[228] See Henseler, Ringle, & Sinkovics (2009), p. 303.

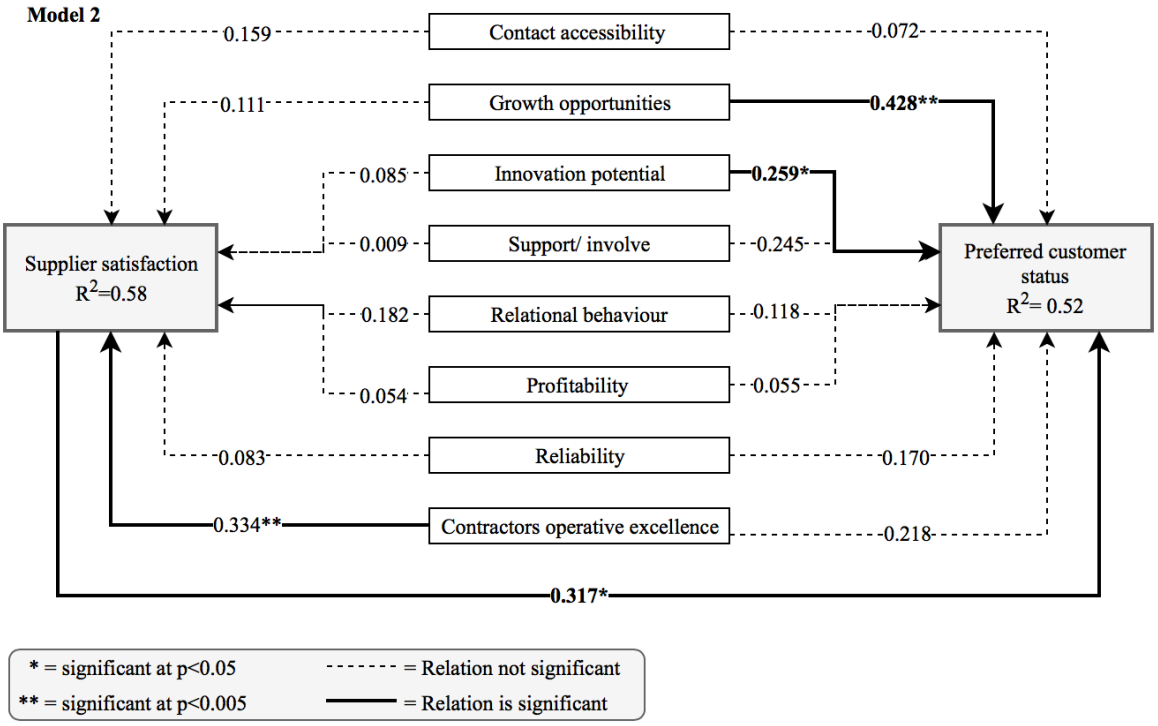

Figure 12: Results of model 2.

8.3. The relations between supplier satisfaction, preferred customer status and preferential treatment (model 3)

8.3.1. Evaluation of the measurement model

For the last model that is evaluated, the constructs supplier satisfaction, preferential treatment and preferred customer status are used. Table *14* shows all relevant statistics for the evaluation of the measurement model. The construct validity and reliability are established since none of the quality criteria drops below the threshold. Furthermore, also discriminant validity is established because the HTMT and the confidence interval are below .85.

Table 14: Quality criteria model 3.

Model 3						
Quality criteria	Composite reliability		Average variance extracted		Cronbach's alpha	
	Value	CI (2.5%)	Value	CI (2.5%)	Value	CI (2.5%)
Preferred customer status	0,914	0,866	0,683	0,570	0,882	0,804
Supplier satisfaction	0,936	0,898	0,745	0,638	0,914	0,862
Discriminant validity					HTMT	CI (97.5%)
Supplier satisfaction -> Preferred customer status					0,578	0,759

8.3.2. Evaluation of the structural model

For the structural model, the path coefficients, p-values, effect size and variance explained are shown in *Table 15*. The model fit indices are shown in Table *16*. Regarding the model

fit, this model shows a good fit since all of the fit criteria are met. A visual representation of the model is shown in Figure *13*. The OLS regression calculations are shown in Figure *14* & Figure *15*. Both are in line with the results from SmartPLS.

Table 15: Path coefficients and variance explained for model 3.

Path coefficients and significance (two-tailed & α = .05)	Path coefficient	P Values	Effect sizes f^2
Preferred customer status -> Preferential treatment	0,683	0,000	0,718
Supplier satisfaction -> Preferential treatment	0,081	0,266	0,010
Supplier satisfaction -> Preferred customer status	0,526	0,000	0,383
Variance explained (R^2)			
Preferred customer		0,277	
Preferential treatment		0,531	

Table 16: Model fit criteria for model 3.

Model fit criteria	SRMR		D_Uls		D_g1		D_g2	
	Value	CI (97.5%)	Value	CI (97.5%)	Value	CI (97.5%)	Value	CI (97.5%)
Model 1	0.074	0.080	0.571	0.673	0.608	0.750	0.494	0.523

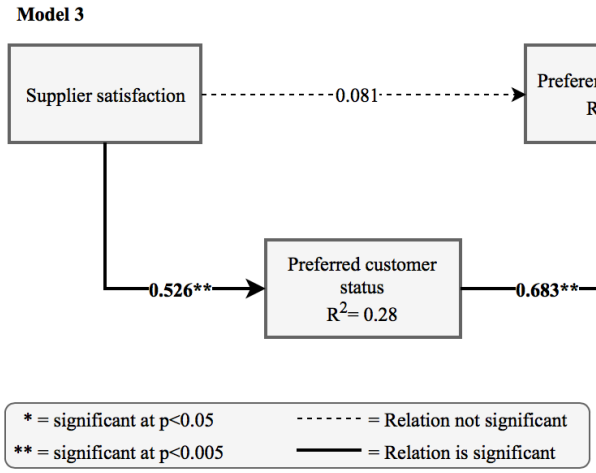

Figure 13: Results of model 3.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2,044E-16	,095		,000	1,000
	Supplier satisfaction	,517	,096	,517	5,399	,000

a. Dependent Variable: Preferred customer status

Figure 14: OLS regression model 3-1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4,057E-17	,080		,000	1,000
	Supplier satisfaction	,055	,094	,055	,584	,561
	Preferred customer status	,671	,094	,671	7,166	,000

a. Dependent Variable: Preferential treatment

Figure 15: OLS regression model 3-2

8.4. Examining the most important success factors for partnering in the construction sector

This paragraph includes the ranking of the critical success factors of partnering. The results are shown in Table *17*. These show that mutual trust, quality of communication and business attitude of the customer are the 3 most important success factors for sub-contractors and suppliers when entering a partnership with a managing contractor.

Table 17: Results of critical success factors.

Critical success factors of partnering		**Mean**	**SD**
No.	**Aspect**	*Influence on supplier satisfaction*	
1	Mutual trust	4,7	0,812
2	Quality of communication (open & effective)	4,55	0,863
3	Business attitude of the customer	4,54	0,945
4	Working relationship	4,46	0,892
5	Alignment of goals and objectives	4,4	1,029
6	Dedicated team from the client	4,37	0,988
7	Flexibility with regard to changes	4,35	0,961
8	Conflict identification & resolution	4,33	0,969
9	Actions consistent with objectives	4,23	1,046
10	Clear understanding and coordination of responsibilities, roles and actions	4,23	1,034
11	The quality of the partnering agreements	4,23	1,034
12	provisions and commitment to continuous improvement	4,22	1,054
13	Commitment of the customer to a win-win situation and fair allocation of profits	4,18	1,09
14	Team building	4,06	1,058

8.5. Analysis of the non-response bias in SPSS: no signs of a non-response bias

Every survey research has to deal with the possibility of a non-response bias. To test whether this bias has an influence on the statistical results presented in this chapter, an independent t-test is executed in SPSS. The respondent's data is split into four quartiles wherein quartile 1 and 4 have 21 data points and quartile 2 & 3 only have 20 data points. The differences between the first and last quartile are examined in SPSS. The results in Table *18* show no signs of a non-response bias and therefore, the results presented in the previous paragraphs and chapters are not influenced by the non-response bias.

Table 18: Non-response bias test in SPSS 23.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
LNGTH_Relationship_230_1	Equal variances assumed	,906	,347	1,030	40	,309	5,0952	4,9445	-4,8980	15,0884
	Equal variances not assumed			1,030	35,739	,310	5,0952	4,9445	-4,9352	15,1257

9. The antecedents of supplier satisfaction and preferred customer status in the construction sector show similarities with other industries

9.1. The analysis of the three regression models confirms nine hypotheses.

The model used for evaluating the preferred customer concepts is developed by Hüttinger et al. (2014) and Vos et al. (2016). A replication of these studies is presented in Appendix E. The survey related to these models was distributed among the sub-contractors and suppliers of a large construction company in the Netherlands. 82 sub-contractors and suppliers returned a valid questionnaire. The hypotheses which were defined in chapter 6 are evaluated below based on the results of the statistical analysis in chapter 8. In total, 3 different models were statistically analysed. The constructs of each model are presented in Table *19*.

Table 19: Constructs of each separate model.

Model 1 *SRMR: 0.080*	**Model 2** *SRMR: 0.083*	**Model 3** *SRMR: 0.074*
Supplier satisfaction	Supplier satisfaction	Supplier satisfaction
Preferred customer status	Preferred customer status	Preferred customer status
Growth opportunities	Growth opportunities	Preferential treatment
Innovation potential	Innovation potential	
Contact accessibility	Contact accessibility	
Relational behaviour	Relational behaviour	
Support/ involvement	Support/ involvement	
Profitability	Profitability	
Reliability	Reliability	
	Contractors operative excellence	

In Table *20*, the results of the hypothesis tests are presented. These show that 9 out of 11 hypotheses are accepted through one or more of the models.

Table 20: Results of the hypotheses.

Hypotheses	**Model 1**		**Model 2**		**Model 3**		**Conclusion**
	ß	P-value	ß	P-value	ß	P-value	
H1a	0.397	0.002	0.182	0.055	--		**Accepted**
H1b	0.072	0.318	0.083	0.238	--		Rejected
H1c	--		0.334	0.001	--		**Accepted**
H2a	0.404	0.004	0.428	0.001	--		**Accepted**
H2b	(-)0.303	0.032	(-)0.245	0.093	--		**Accepted**
H2c	(-)0.303	0.032	(-)0.245	0.093	--		**Accepted**
H2d	0.239	0.037	0.317	0.009	0.526	0.000	**Accepted**
H3a	--		--		--		**Accepted**
H3b	--		--		--		**Accepted**
H3c	--		--		--		Rejected
H3d	--		--		0.683	0.000	**Accepted**

The first hypothesis (H1a) confirms prior results in a sense that relational behaviour also has a positive impact on supplier satisfaction in the construction sector. The second hypothesis is rejected (H1b), reliability of the customer is no antecedent of supplier satisfaction within this sample. This contradicts prior findings by Hüttinger et al. (2014) and Vos et al. (2016).[229] The third hypothesis is confirmed by model 2, the new construct *contractor's operative excellence* has a significant positive impact on supplier satisfaction.

Further on, hypothesis H2a is also accepted. Suppliers and sub-contractors thus find growth opportunities offered by the managing contractor important for defining a customer as a preferred customer. Regarding hypothesis H2b & H2c, support and involvement were not distinctive factors in the data and thus, the hypotheses defined in chapter 6 result in the same path coefficients. The construct support/ involvement is significant for sub-contractors and suppliers regarding their choice for preferred customers. Hypothesis H2d is accepted and thus supports the results from prior studies that supplier satisfaction is an antecedent of preferred customer status. Also supporting prior results is hypothesis H3d, which is accepted and shows that obtaining the preferred customer status in the construction sector will also lead to preferential treatment by suppliers and sub-contractors.

The critical success factors for partnering in the construction industry were also used to develop three hypotheses. Two of these hypotheses are confirmed. Mutual trust is perceived to be the most important aspect for long-term relations. In second place is the effective communication between partners. Lastly, not alignment of objectives is in third place but the business attitude of the customer is ranked third.

9.2. Relational behaviour and contractor's operative excellence as most important antecedents of supplier satisfaction in the construction sector

The results from model 1 show that the construct relational behaviour has a positive impact on supplier satisfaction in the construction sector. With an effect size of .152, the effect can be categorized as medium. The results from the Hüttinger et al. (2014) study also show a significant relation between relational behaviour and supplier satisfaction. The results from the Vos et al. (2016) study show a significant relation between relational behaviour and

[229] See Hüttinger et al. (2014), p. 711.; Vos et al. (2016), p. 4618.

supplier satisfaction only for direct procurement. This study thus confirms prior results related to the impact of relational behaviour on supplier satisfaction.

Model 2 shows that the new construct of contractor's operative excellence also has a positive impact on supplier satisfaction. The effect size of this relation is equal to .128. Since the operative excellence construct is newly developed in this study, only a comparison can be made with the more general operative excellence construct used in prior studies. This construct was only significant in the study of Vos et al. (2016) for indirect procurement. Hüttinger et al. (2014) did not find a significant relation between operative excellence and supplier satisfaction in their study. However, the new construct is much more specific for the operative excellence of contractors and therefore may yield different results compared to the more general operative excellence construct used in prior studies. Together, relational behaviour and contractor's operative excellence account for 50% of the variance explained in the supplier satisfaction construct.

9.3. Growth opportunities and innovation potential are the most important antecedents of preferred customer status

Both model 1 and 2 show significant relations between growth opportunity and preferred customer status and innovation potential and preferred customer status. The effect sizes for growth opportunities (.169 & .193) can be categorized as medium. For innovation potential, the effect sizes (.092 & .068) are categorized as small. Together, growth opportunities and innovation potential account for 38% of the variance explained in the preferred customer construct. Prior research also shows significant relations between growth opportunity and preferred customer status.[230] However, innovation potential is not significant for preferred customer status in the study of Hüttinger et al. (2014) and was also not expected to be of significant impact (see chapter 6). The see whether an industry specific characteristic has an influence on this relation, an in-depth analysis of the construct and its indicators is executed (see paragraph 10.2).

The hypothesis that support and involvement (H2b & H2c) have a positive impact on preferred customer status in the construction sector is accepted (model 1). However, the effect size (0.066) is categorized as small. Moreover, as shown in model 2, the inclusion of

[230] See Hüttinger et al. (2014), p. 711.

the new operative excellence construct has an influence on the relation between support/involvement and preferred customer status. The relation is not significant at 5% anymore, this is probably the result of the small sample size (N=82) since the effect size can still be categorized as small (0.043). This is also supported by the OLS regression analysis in paragraph 10.4 which shows that support/involvement has a p-value of 0.051. Finally, the construct support/involvement accounts for 14% of the variance explained in the preferred customer construct. The merger of the two constructs will be discussed in paragraph 10.1.

9.4. Supplier satisfaction leads to the preferred customer status which will lead to preferential treatment of customers

The last model tested in this thesis was model 3. This model examined the relations between supplier satisfaction, preferred customer status and preferential treatment. The data supports both hypothesis and thus it is concluded that supplier satisfaction is an antecedent of preferred customer status and preferred customer status (supplier intention) will lead to preferential resource allocation (supplier behaviour). These findings confirm the results from the Vos et al. (2016) model. Lastly, supplier satisfaction explained 28% percent of the variance in the preferred customer status construct and preferred customer status accounts for 53% of the variance explained in the preferential treatment construct.

9.5. Industry comparison: The construction industry is similar to other core industries

This paragraph compares the results from the supplier satisfaction survey with the results from other industries. The results of this comparison are shown in Table *21* & Figure *16*.

Table 21: Cross-industry comparison

Cross-industry comparison	Defence	Chemical	Automotive	Construction
Innovation potential	43,26%	53,00%	61,00%	54,00%
Involvement	56,81%	52,00%	64,00%	58,80%
Support	60,05%	67,00%	55,00%	63,20%
Growth	61,16%	67,00%	74,00%	59,20%
Preferential treatment	61,39%	80,00%	74,00%	64,60%
Pref. Cust. Status	63,18%	82,00%	71,00%	63,60%
Relational behaviour	70,58%	72,00%	53,00%	70,20%
Contact accessibility	73,85%	85,00%	59,00%	67,80%
Collaboration	75,72%	89,00%	57,00%	72,40%
Supplier satisfaction	80,60%	90,00%	73,00%	75,40%

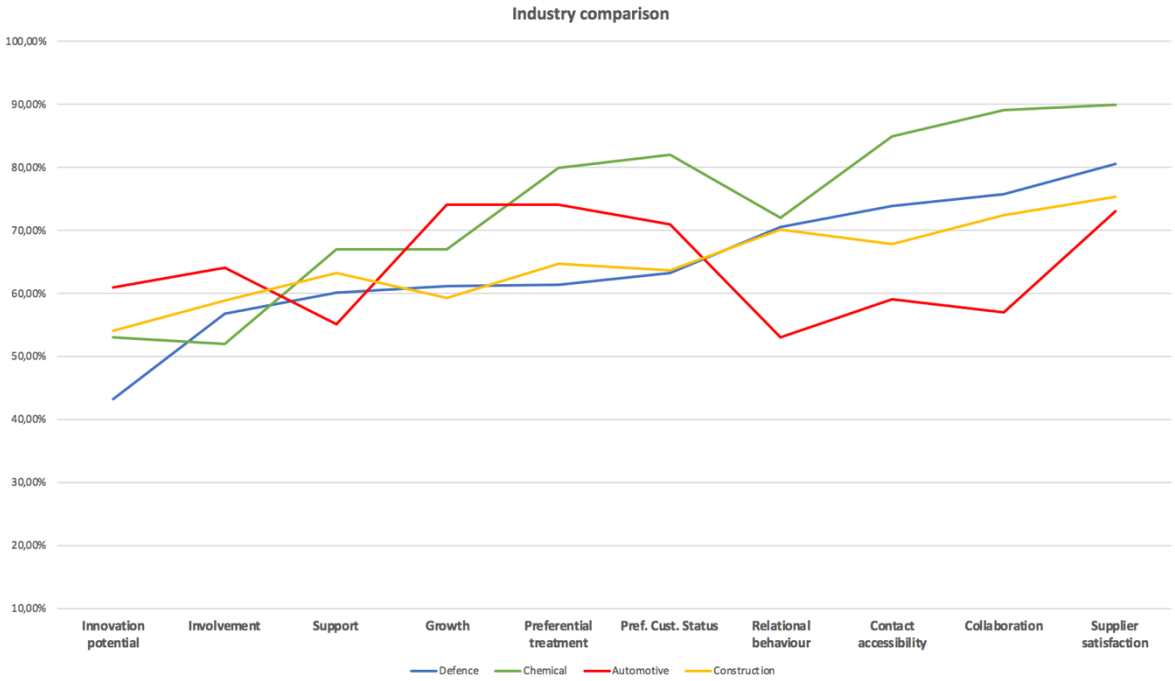

Figure 16: Cross-industry comparison

As shown in the comparison, the construction industry is similar to other core industries and most in line with the defence industry. Next to this general comparison, the response rate can also be of interest. The response rate of the survey distributed in this thesis was equal to 10.5%. This rate of response is lower than the average of 15-25%[231] and thus, the suppliers and sub-contractors of Strukton were less willing to fill in the survey compared to an average company. This may have affected the results since it is more likely that companies which were satisfied with the relation filled in the survey compared to the dissatisfied suppliers and sub-contractors. Therefore, the results from this survey are expected to be on the high end of the spectrum and thus show a slightly more positive scenario due to the low response rate.

[231] See Vos et al. (2016) p. 4616.

10. Discussion of the results: Industry characteristics influence several pre-defined constructs in the original measurement model

10.1. The relation between support and involvement in the constructions sector

The factor analysis of both model 1 and model 2 show a similar distribution of factors. Notable in these factor analyses is the fact that support an involvement load into the same factor. This paragraph will elaborate on the possible explanations for this by taking a closer look at the nature of both constructs in relation to the characteristics of the industry. The questions which relate to both constructs are shown in Appendix B.

Support of suppliers is defined by Krause & Ellram (1997) as ‘’*any effort of a buying firm with a supplier to increase its performance and/or capabilities and meet the buying firm's short and/or long-term supply needs'' (p. 39).*[232] Supplier involvement is described by Handfield et al. (1999) as *the integration of a supplier into the development process of new products for the customer*.[233] To place these definitions in the context of the construction industry, a closer look at the tender process in construction is needed.

Managing contractors, as the name implies, manage construction projects. Since the tender process consists of all different aspects of a project, including design and calculation, a managing contractor needs the help of sub-contractors and suppliers. A distinction must be made between suppliers and sub-contractors who deliver (1) standardised products and (2) specialist suppliers and sub-contractors. This distinction is also affecting the kind of collaboration that is present between managing contractors and sub-contractors in a tender phase. For category 1 products, vertical collaboration (transactional approach) is used more often. For category 2 products, horizontal collaboration (collaborative approach) is used more often.

Within a tender phase, the managing contractor sends RFP's to category 1 suppliers to obtain price information for their products. More than often, these products are bought for the lowest price the managing contractor can get form the market. Based on those prices, the contractor calculates the standard components of the project. The category 2 suppliers are involved in the formulation of the tender documents. For example, the client wants a steel

[232] See Krause & Ellram (1997), p. 39.
[233] See Handfield, Ragatz, Petersen, & Monczka (1999), p. 59.

bridge to arch a river. The expertise to design such a complex structure is present at a category 2 supplier and thus, this supplier is asked to collaborate with the managing contractor in designing the bridge. The supplier from the example is thus *involved* in the development of a new product (the steel bridge) for the customer (managing contractor). Furthermore, the definition of support on the previous page states that any effort of the buyer in increasing the supplier's capabilities to meet future needs of the buyer is called *support* of the supplier. In essence, the managing contractor is supporting the supplier of the steel bridge to develop the bridge by integrating this supplier into the tender team through horizontal collaboration. This experience will increase the supplier's capabilities and the collaboration with the managing contractor will lead to an inevitable crossing of experts on the field of project management of which the specialist supplier can learn to improve their design. Thus, the specialist supplier is *supported*. Extending this line of argument towards the questions asked in the questionnaire it is evident that the questions related to support are mostly about advice directed towards suppliers and thus relate to the horizontal collaboration in a tender team. Secondly, the questions about involvement relate to the involvement of suppliers in the process of developing new products and is therefore also related to the horizontal collaboration in a tender team (in essence, a tender is about designing a one-of a kind project/ product). The conclusion to merge the constructs and conduct the statistical analysis with a combination of these constructs is thus deemed appropriate considering the characteristics of the construction industry, especially in the tender phase.

10.2. The nature of innovations in the construction sector

The survey questions asked for innovation potential are shown in Appendix B. These are mostly concerned with the number of new products and services brought to the market in collaboration with the buyer, and whether the buyer is able to react to changing market circumstances. Two industry specific aspects may influence the way how these questions are interpreted by the respondents and thus affect the results. First of all, every construction project is in essence a new product and since it is a one of a kind, locally bound product there are not many similar products. Every project is thus also concerned with the development of a new product, often in collaboration with sub-contractors and suppliers. Note to this argument is that the sector which is served by the focal company of this study is mostly infrastructure. Within the housing infrastructure, products can, to some extent, be replicated. Something which is nearly impossible in the infrastructure sector. The questions

in the survey which relate to new products can thus argued to be interpreted as new projects and therefore influence the results.

Secondly, the construction market, and especially the infrastructure market is heavily dominated by clients. This client led market is also partly the result of the tender regulations. Clients define projects and often also define full specifications about (1) the project itself and (2) about the participants in the tender. Technological developments such as building information modelling (BIM) or system engineering (SE) are often (quality) criteria in a tender. Therefore, for managing contractors to stay competitive, they must adopt these practices to have a chance of winning tenders. The innovations which are adopted in the construction sector are thus often client-led and managing contractors must respond to remain competitive. This aspect of the construction sector may also have an influence on the way the construct is interpreted by the respondents.

10.3. Operative excellence in the construction sector; focus on on-site & tender processes rather than predictions about the future.

The operative excellence construct which is part of the standard measurement model of the survey proved to be unusable in the construction sector. This has to do with the need and transaction uncertainty present in the construction sector (also see paragraph 5.2). The newly developed construct which was developed in for this study proved its relevance. Originally, the new construct consisted out of two separate constructs (tender and execution processes). However, the factor analysis shows that the 10 survey questions loaded onto the same factor. This led to the merger of the two constructs. Additionally, the second question of the tender processes was deleted because of a very low factor loading (<0.1). This led to the new construct displayed in Table *22*.

Table 22: New operative excellence construct

Contractor's operative excellence	**CR: 0,907**
The company is...	
...Is safety conscious at the construction site	
...Pays variations promptly	
Site staff has a cooperative attitude	
...Properly notifies you of variations	
...Coordinated activities between various sub-contractors in an efficient manner	
...Provides all necessary contract information on time	
...Timely involves your firm for the tender process	
...Has sufficient knowledge about tender procedures to see it through	
…Listens and treats your ideas and suggestions on a fair and transparent manner.	

Based on the results of this thesis, the new operative excellence construct is usable to measure the operative excellence of managing contractors based in project-based, on-site and tender processes. This is considered to be more suitable in the environment of the construction industry where need and transaction uncertainty influence the ability of managing contractors to make predictions about future demand.

10.4. Analysis of negative path coefficients in the structural models.

In model 1, the path coefficient of support/involvement is negative (-.303), implying a negative influence of support/ involvement on preferred customer status. The results of model 2 show a negative relation between support/ involvement and preferred customer status (-.245). Additionally, model 2 shows another negative influence on preferred customer status; operative excellence of the contractor (-.218). From theoretical and logical reasoning, it is not expected that these constructs should have a negative influence on the dependent variable. Therefore, both support/involvement and contractor's operative excellence are tested in SPSS to see whether the negative values hold. For this analysis, the factor analysis was repeated and factor scores are retained in a new variable. By executing an OLS regression analysis with preferred customer status as dependent variable, the path coefficients are analysed. The results are shown in Table *23*.

Table 23: OLS regression test in SPSS 23.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-3,266E-17	,107		,000	1,000
	Support/ involvement	,214	,108	,214	1,981	,051
	Contractors operative excellence	,190	,108	,190	1,761	,082

a. Dependent Variable: Preferred customer status

From the table above, it can be concluded that both support/involvement and contractor's operative excellence indeed have a positive relation with preferred customer status. The calculations with SmartPLS presented in chapter 8 are thus considered to be influenced by the indicator correlations, which resulted in a negative value. These indicator correlations do not influence the calculation in SPSS since the factors are retained independently before the OLS regression is executed. The full regression analysis of both models is shown in Appendix C.VI & Appendix D.VI.

11. Developing long-term relations with excellent suppliers in the construction sector must be approached with a step-by-step process

11.1. Implementing the results of this thesis into an existing framework shows a clear step-by-step process to develop buyer-supplier relationships in the construction sector

Changing market circumstances and the implementation of Best value procurement enhances the need for managing contractors to establish structural relations with sub-contractors and suppliers to gain quantifiable performance information. The research concerned with establishing these long-term relations with sub-contractors and suppliers in the construction industry focussed mainly on the development of partnerships and their success factors. These partnerships are subject to various difficulties resulting from the structure of the market and other central features of the industry. Firstly, in an effort to stay competitive, managing contractors are still using price as one of the main selection criteria when selecting sub-contractors and suppliers. This is the result of the fierce competition between managing contractors on supply chain level. And since construction projects are bound to specific locations changing every project, exclusive partnering with a sub-contractors and suppliers who are relatively far away compared to other suppliers can have a major influence on the cost level of managing contractors and therefore damaging their competitive position. Additionally, every construction project is a one-of a kind and the capabilities needed to successfully complete these projects change with every project. For managing contractors, it is thus important to have a geographically spread network of sub-contractors and supplier with all kinds of (specialist) capabilities. Despite the fact that partnering is such a widely accepted approach to buyer-supplier relations in the construction sector, a precise step-by-step approach is not clearly defined. This thesis aims at contributing to this stream of literature by exploring another type of buyer supplier relation; the preferred customer status.

The results of this thesis contributed to an increased understanding of buyer-supplier relations in the constructions sector. The changing market circumstances and the introduction of BVP stimulates the competition for suppliers and thus, managing contractors want to become a preferred customer for key suppliers & sub-contractors. The application of the theory related to the concept of preferred customers has yielded several insights into the development and maintenance of buyer-supplier relations in the construction industry,

especially related to suppliers which possess power over buyers. By combining insights of the literature related to buyer-supplier relations in construction and the preferred customer concept it is argued that partnering in the construction industry must be approached step-by-step, similar to the approach used to become a preferred customer. This similarity is also present in some of the definitions of partnering and preferred customer status. Partnering is being advocated as a means to obtain the best performance form the supply chain (e.g. the best sub-contractors).[234] And preferred customer status is advocated to be a means to gain preferential treatment (e.g. highest quality) from the supply chain.[235] Both are thus concerned with attracting and maintaining relations with the best sub-contractors and suppliers in the supply chain.

Partnerships can be classified according to partnerships related to projects and partnerships related to long-term, strategic collaboration. This thesis advocates that successful project-partnering is the first step in the process to develop a long-term relation. The two existing frameworks of Nollet et al. (2012) & Schiele et al. (2012), are used for defining a step-by-step approach towards long-term collaboration in the construction sector in relation to the preferred customer concept.[236] The combined framework is shown in Figure *17*. The main aspect in the combination of both frameworks is the fact that the performance step is equal to the antecedents of supplier satisfaction and the engagement step is similar to the antecedents of preferred customer status. Furthermore, the engagement phase is a costly phase for both parties since investments are needed to increase commitment.[237] Therefore this step is not applicable for short-term relations but rather for medium/ long-term relations (recurrent suppliers). The same applies for the sustainability step.

[234] See among others; Ellram & Edis (1996), p. 26.; Wong (2000), p. 428.
[235] See Nollet et al. (2012), p. 1186.
[236] See Nollet et al. (2012), p. 1189. & Schiele et al. (2012), p. 1180.
[237] See Nollet et al. (2012). p. 1190.

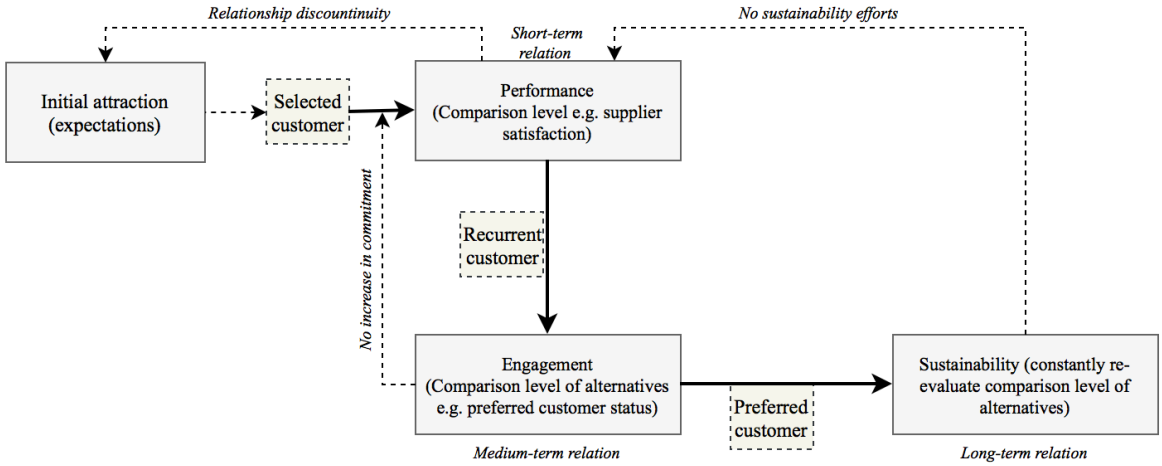

Figure 17: Becoming a preferred customer.

From the statistical analysis in chapter 8, the following statements can be made regarding the antecedents of supplier satisfaction and preferred customer status (e.g. step 1 & 2) in the construction sector. The two main antecedents for supplier satisfaction are relational behaviour and contractor's operative excellence. The main antecedents for preferred customer status are growth opportunities, innovation potential and support/involvement of suppliers. Based on these results and the characteristics of the industry, the model is adapted and shown in Figure *18*. An elaboration of each step is presented below. Initial attraction is not a part of the research scope and thus left out of analysis.

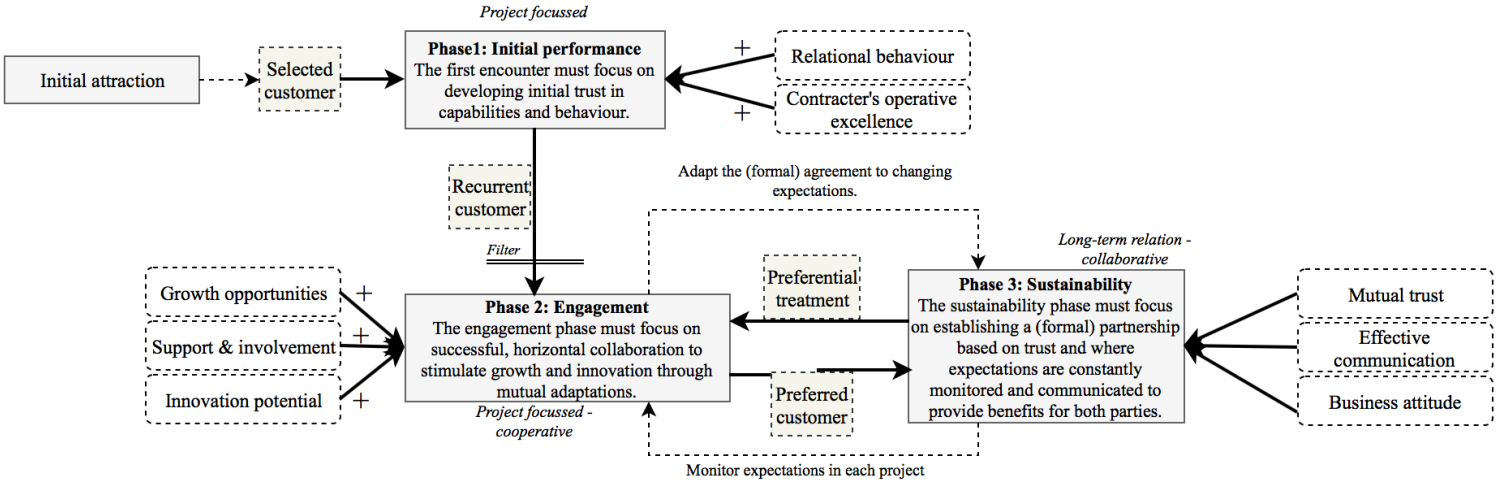

Figure 18: Adapted from Nollet at al. (2012, p. 1188)

Step 1: Develop mutual trust in capabilities and behaviour

The performance step should focus on the satisfaction of basic value and relational quality according to Nollet et al. (2012).[238] The results of this study show that supplier satisfaction in the construction sector can be achieved by improving relational behaviour and operative

[238] See Nollet et al. (2012), p. 1190.

excellence. It is argued that in the first project where there is collaboration between the supplier and managing contractor, the managing contractor should focus on showing their competence in operational processes and establish trust in the behaviour of employees. In other words, the supplier must feel confident that the employees of the managing contractor have reliable and trustworthy behaviour and that the managing contractor is able to execute his work in a professional manner. If these conditions are met, the managing contractor can become a recurrent customer. The focus of this phase is on project level.

Step 2: Engage in horizontal collaboration to become more competitive

The second step is called the engagement step by Nollet et al. (2012). The focus of the second step in the new framework is collaboration across several similar projects (e.g. successful project partnering). The results of the survey show that the support & involvement of suppliers, growth opportunities and innovation potential have a positive influence on becoming a preferred customer. In the perspective of the construction industry, the engagement step should thus focus on establishing horizontal collaboration (support/involve) in the tender & execution phases of projects. Horizontal collaboration will lead to the combination of each other's qualities and thus increase the quality of solutions. Combining the knowledge of two partners in finding solutions can also increase innovation. Furthermore, by increasing the quality of the proposals submitted, growth can be established by winning more tenders. Additionally, by implementing synergies in the tender & execution processes through mutual adaptations in processes, cost-reductions can be achieved for both supplier and buyer which also stimulates growth. According to the results of the survey, implementing the above-mentioned aspects will increase the chances for a managing contractor to become a preferred customer/ partner for suppliers & sub-contractors. An additional benefit is also the result of involving the sub-contractors and suppliers horizontally within a tender. By doing so, the importance of quantifiable performance information can also be shown to sub-contractors and suppliers and therefore increase their willingness to share that type of information if it provides benefits to the sub-contractor as well.

Finally, the project-based character of the industry has a high influence on the way buyer-supplier relations are implemented and organised. The need and transaction uncertainty introduce risks for managing contractors to engage in long-term relations with sub-contractors and suppliers. Additionally, the nature of projects (locally oriented, one-of a kind

and technically complex) also limit the possibilities for managing contractors to have long-term relations with their supply base. Finally, the engagement phase requires investments to increase commitment which also increases the risk for managing contractors. These investments are however, also recognized as an antecedent of preferred customer status in the construction sector.[239] Therefore, managing contractors should carefully analyse the supply base and select possible strategic partners before making the decision to enter the engagement phase (*filter* in Figure *18*).

Step 3: Establish long-term (formal) relations based on trust and a continuous re-assessment of expectations

The final step in the framework is concerned with the maintenance of the relation, which is argued to be the implementation of an agreement between two parties for long-term collaboration (strategic partnering). This step is the first one which is not focussed on projects. Based on the mutual trust in competence and behaviour, the growth that is established by collaborating and mutual synergies which are achieved by successfully executing step 1 & 2, a bilateral agreement should be made between the supplier & buyer. This agreement should focus aspects which are not bound to projects, such as adapting business processes to each other's needs and the measurement of performance information (QPI's). Additionally, also innovation can be an aspect which is discussed between long-term partners. For each individual project it remains important to revisit step 1 & 2 (project partnering) to maintain the good relation. However, the formal agreement between parties can provide a solid framework in which a mutual beneficial relation exists, if and only if, the agreement is updated regularly to meet the supplier's expectations on each project. Lastly, the results from the survey show that preferred customer status will indeed lead to preferential treatment by suppliers and thus, entering in a long-term collaboration may also include the benefits which are related to the preferred customer status. Figure *19* shows a visualisation of the description above wherein the strategic partnership forms the basis for successful project partnerships and also provides benefits for the long-term, such as the measurement of performance information across projects.

[239] See Bemelmans et al. (2015), p. 183.

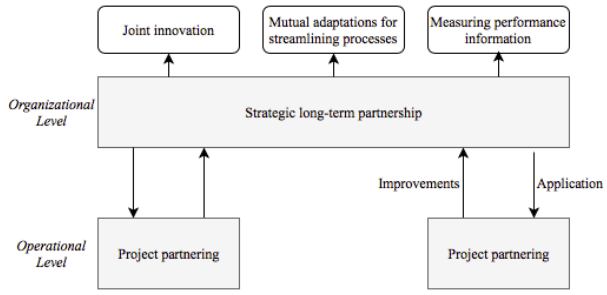

Figure 19: Strategic partnerships as overarching agreement for successful project partnerships.

The three steps elaborated above provide an insight into the sub-contractor's perspective on buyer-supplier relations in the construction sector. The framework proposes a step-by-step approach to develop a relationship with the best sub-contractors and suppliers in the construction sector. Additionally, it provides focal points for each of the different phases which can be used by managing contractors to allocate their efforts.

11.2. Improving growth opportunities, innovation potential and involvement of suppliers to become a preferred customer and establish long-term relations

The survey results also show certain high and low scoring constructs. The aspects of phase 1, relational behaviour (3,51) and contractors' operative excellence (3,47) score significantly higher than the constructs related to phase 2; innovation potential (2,70), growth opportunities (2,96), support of suppliers (3,16) and involvement of suppliers (2,94). This implies that Strukton has established trust in their capabilities and behaviour for the first interaction with suppliers and that suppliers are confident in working with Strukton. For phase 2, this is not the case. Especially the innovation potential, growth opportunities and supplier involvement of Strukton is perceived to be low. To improve these antecedents of preferred customer status, three recommendations are formulated. These recommendations are primarily focussed at a small group of excellent suppliers for which Strukton wants to become a preferred customer. The three recommendations are formulated as:

1. To improve the *growth opportunities* perceived by suppliers, Strukton should extend their supplier selection system.
2. To improve the *involvement of suppliers* into tenders, Strukton should define criteria which are used to form a decision about supplier involvement in the tender phase.
3. To improve the *innovation potential* and its perception towards suppliers, Strukton should incorporate innovation criteria into the collaboration agreements with excellent suppliers.

Recommendation 1: Growth opportunities

Offering growth opportunities to excellent suppliers and sub-contractors in the construction sector is hard because of the need & transaction uncertainty which is present. Moreover, working with one party for a long time may result in a negative influence on performance since other suppliers and sub-contractors may have found smarter solutions or lowered their prices. This has an influence on the price level of the managing contractor and therefore resulting in less tenders won. To improve this aspect, Strukton could start by selecting suppliers and sub-contractors on more than price only. Nowadays, a superficial supplier selection process is in place which is mostly executed based on experiences and ad hoc decisions. Extending this process and incorporate additional criteria (with possible discount options for excellent past performance) constructs an incentive for suppliers and sub-contractors to constantly improve their business and therefore remain a good supplier/ sub-contractor for a managing contractor. It can also increase the perception of growth opportunities since offering an excellent product in terms of price and quality can yield additional work which was not acquired with price only selection.

Recommendation 2: Supplier involvement

Currently, the decision to include suppliers is based upon an ad hoc evaluation of demands. To improve the perception of suppliers regarding their involvement, Strukton should define criteria which can be used to decide whether to include a supplier/sub-contractor in a tender. These criteria should focus on the possible contributions of a supplier/sub-contractor on the project result/ solution. Communicating these criteria towards suppliers can create understanding for the inclusion or exclusion of suppliers and sub-contractors in a tender phase.

Recommendation 3: Innovation potential

The last recommendation is about the perceived innovation potential of Strukton. To improve this perception, Strukton should start with defining internal innovation goals and objectives for their relations with suppliers and sub-contractors. These goals and objectives can then be incorporated into (1) the supplier selection system and/or (2) collaboration agreements made with excellent suppliers and sub-contractors. Lastly, communicating these objectives and goals towards supplier may improve the perception of the innovation potential which Strukton has.

12. Limitations, implications and future research directions

As any academic research, this thesis also has its limitations. First of all, the sample size is small (82). Even though the SEM-PLS methods allows small sample sizes to be used in statistical analysis, the results of this study should be interpreted with caution. The small sample size also had an effect on the exploratory factor analyses in SPSS. None of the factor analyses allowed the researcher to use all measured constructs in one analysis. Moreover, as shown in the replicated model of Vos et al. (2016), the sample size was too small to provide an appropriate model fit (SRMR) with the existing model. For these reasons, several partial models were analysed to ensure the correctness of the statistical analysis and establish model fit. The sample size also limits the generalizability of the results. Since the managing contractors in the construction industry are heavily relying on their sub-contractors and suppliers, and the economy is growing, the construction market is very large (>150.000 companies).[240] Of all these companies, only 82 of these companies have filled in the questionnaire which emphasises the exploratory nature of this study. To capture the entire industry, a sample size of at least 400 is considered acceptable.[241]

Furthermore, the questionnaire that was used is developed with a strong focus on a series-based production industry where buyer-supplier relations are formed in other ways than in a project-based industry. The questions asked to the respondents can thus be interpreted in different ways since the processes which are implied in the questions are not at all, or only partially present in the construction sector. Examples of this are discussed in chapter 10 related to the constructs of innovation potential, operative excellence and support/ involvement of suppliers.

Table 24: Categories of the respondents.

Category	Amount
Contractor	22
Consultancy	8
ICT	1
Material supplier	29
Rent and transport	6
Other	16
Total	**82**

[240] See https://opendata.cbs.nl/statline/#/CBS/nl/dataset/81589ned/table?ts=1530281935306
[241] Approximation using a population of 150.000 and an error margin of 5%.

Another limitation is the result of the industries in which the respondents operate. The sample consists of all kinds of different suppliers and sub-contractors as is shown in Table *24*. As stated before, different types of collaboration exist in the construction sector, mainly divided into horizontal or vertical collaboration. The distribution of the sample show that 29 material suppliers finished the survey. This kind of suppliers are often selected on price only implying a vertical collaboration. The same argument can be used for suppliers which are concerned with renting machinery and transporting materials. Contractors and consultancy firms are more often engaged in horizontal collaboration. The differences between those two types of collaboration may have an influence on the relations in the model.

Additionally, the results and limitations of this research have various implications and directions for future research. First of all, partnering in the construction sector is often assumed to be present or absent, in a sense that a supplier can be a partner, or he is no partner at all. Several authors have made distinctions between project partnering and strategic partnering however, none of these researchers provide any step-by-step framework to become a project-partner or a strategic partner. The framework presented in the conclusion of this study implies that there are several steps to be taken to create successful partnering agreements between suppliers and buyers in the construction sector. Additionally, the framework provides an exploratory vision on which aspects to consider in each stage of the process. This framework is therefore considered to be the most important theoretical contribution of this thesis.

Secondly, the results from the statistical analysis show high compliance with results from earlier studies into supplier satisfaction and preferred customer status. Therefore, the results from this study contribute to the growing research field of preferred customers and show that industry contexts have only minor effects on the way suppliers perceive satisfaction. However, as stated in the limitations, the sample size is small and thus generalisability towards the entire construction industry should be done with caution.

Thirdly, the new operative excellence construct developed in this thesis proved its utility in the context of the construction industry. Therefore, another theoretical implication of this thesis is the fact that operative excellence in the construction sector must focus on on-site & tender processes rather than on predictions about the future. Future researchers which

conduct supplier satisfaction surveys in the construction sector should therefore use this new construct opposed to the old construct.

Regarding additional research directions; future researchers should focus on establishing a more confirmatory approach towards supplier satisfaction in the construction industry by increasing sample size and make distinctions between different types of suppliers (especially related to the type of collaboration). The prior studies of Hüttinger et al. (2014) and Vos et al. (2016) as well as this study can be used to define the constructs since the factor analysis shows that the predefined constructs of Hüttinger et al. (2014) and Vos et al. (2016) are also applicable in the construction industry. However, modifications should be made to the constructs of support & involvement and innovation potential since these are argued to be different in nature within a project-based industry (see chapter 10).

Additionally, future researchers should look at the internal processes of managing contractors in relation to the management of buyer-supplier relations. This will help in understanding the antecedents of supplier satisfaction and preferred customer status more thoroughly and see what processes influence the perception of suppliers on those antecedents.

Lastly, future researchers can use the adapted framework of Nollet et al. (2012) as a starting point for their research. By confirming the antecedents of each step and possibly even add new sub-steps, the researcher can confirm that this step-by step framework forms a new direction in implementing long-term partnership in a project-based environment.

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Appendix

Appendix A. Critical success factors for partnering

Success factors for partnering in construction	
Mutual trust	Black et al., 2000, p. 429; Cheng & Li, 2002, p. 200; Cheng et al., 1999, p. 86; Kim & Nguyen, 2018, p. 176.
Alignment of goals and objectives, actions consistent with objectives & partnering goals.	Black et al., 2000, p. 429; Chan et al., 2004, p. 195; Cheng & Li, 2002, p. 200; Cheng et al., 1999, p. 86; Kim & Nguyen, 2018, p. 176.
Communication (open & effective) & communication strategy.	Black et al., 2000, p. 429; Chan et al., 2004, p. 195; Cheng & Li, 2002, p. 200; Cheng et al., 1999, p. 86; Kim & Nguyen, 2018, p. 176.
Business attitude, commitment to win-win and fair profit.	Chan et al., 2004, p. 195; Kim & Nguyen, 2018, p. 176; Larson, 1997, p. 192.
Length of commitment (long-term)	Cheng & Li, 2002, p. 96; Kim & Nguyen, 2018, p. 176.
Provisions & commitment to continuous improvement.	Black et al., 2000, p. 429; Chan et al., 2004, p. 195; Cheng & Li, 2002, p. 200; Kim & Nguyen, 2018, p. 176; Larson, 1997, p. 192.
Working relationship	Cheng & Li, 2002, p. 200; Kim & Nguyen, 2018, p. 176; Larson, 1997, p. 192.
Clear understanding and coordination of roles, responsibilities & activities.	Black et al., 2000, p. 429; Chan et al., 2004, p. 195; Cheng & Li, 2002, p. 200; Cheng et al., 1999, p. 86.
Flexible with regard to changes	Black et al., 2000, p. 429
Dedicated team, team building & commitment	Black et al., 2000, p. 429; Chan et al., 2004, p. 195; Cheng & Li, 2002, p. 200; Larson, 1997, p. 192.
Conflict identification & resolution	Chan et al., 2004, p. 195; Cheng et al., 1999, p. 86; Larson, 1997, p. 192.
Perceived satisfaction	Cheng et al., 1999, p. 86.
Partnering agreements	Cheng & Li, 2002, p. 200.

Appendix B. Survey data.

I. Survey questions

Code	Question (ENG)
	Contact accessibility
	There is a contact person within Strukton/Reef who…
S_Available_10_1	…coordinates the relevant relationship activities within and outside of Strukton/Reef.
S_Available_10_2	…is, for the employees of our company, the one to contact in regard to partner-specific questions.
S_Available_10_3	…informs employees within Strukton/Reef firm about the needs of our company.
	Growthpotential for your company
	The relationship with Strukton/Reef …
S_Growth_20_1	… provides us with a dominant market position in our sales area.
S_Growth_20_2	… is very important for us with respect to growth rates.
S_Growth_20_3	… enables us to attract other customers.
S_Growth_20_4	… enables us to exploit new market opportunities.
	Innovation potential
S_InnovationPot_30_1	In collaborating with Strukton/Reef, our firm developed a very high number of new products/services.
S_InnovationPot_30_2	In collaborating with Strukton/Reef, our firm was able to bring to market a very high number of new products/services.
S_InnovationPot_30_3	The speed with which new products/services are developed and brought to market with Strukton/Reef is very high.
S_InnovationPot_30_4	Strukton/Reef is able to respond quickly to (technological) developments in the market.
S_InnovationPot_30_5	Strukton/Reef is able to anticipate competitors' (technological) developments.
	Operative excellence
	Strukton/Reef…
S_OperativeExc_40_1	… has always exact and in time forecasts about future demand.
S_OperativeExc_40_2	… provides us with forecasts our firm can rely and plan on.
S_OperativeExc_40_3	… has for our firm simple and transparent internal processes.
S_OperativeExc_40_4	… supports short decision-making processes.
S_OperativeExc_40_5	… stands open for process optimizations.
S_OperativeExc_40_6	… has an optimal payment habit.
	Maturity
	Strukton/Reef…
S_Maturity_45_1	Makes a professional impression on us.
S_Maturity_45_2	Has all relevant information of our files prepared
S_Maturity_45_3	Knows a structural and consequent communication strategy
S_Maturity_45_4	Uses experts for negotiating with us
S_Maturity_45_5	Gives the impression that the internal processes are organized properly
	Reliability
	In working with our company, Strukton/Reef…
S_Collaboration_50_1	… provided a completely truthful picture when negotiating.
S_Collaboration_50_2	… always negotiated from a good faith bargaining perspective.
S_Collaboration_50_3	… never breached formal or informal agreements to benefit themselves.
S_Collaboration_50_4	… never altered facts in order to meet its own goals and objectives.
	Support
	Strukton/Reef …
S_Support_60_1	… collaborates with us to improve our manufacturing processes or services.
S_Support_60_2	… gives us (technological) advice (e.g. on materials, software, way of working).
S_Support_60_3	… gives us quality related advice (e.g. on the use of inspection equipment, quality assurance procedures, service evaluation).
	Involvement
S_Involvement_70_2	We are early involved in the new product/service development process of Strukton/Reef.
S_Involvement_70_3	We are very active in the new product development process of Strukton/Reef.
S_Involvement_70_4	Communication with our firm about quality considerations and design changes is very close.

Code	Question (ENG)
	Relational behaviour
S_RelBehavior_80_1	Problems that arise in the course of the relationship are treated by Strukton/Reef as joint rather than individual responsibilities.
S_RelBehavior_80_2	Strukton/Reef is committed to improvements that may benefit our relationship as a whole and not only themselves.
S_RelBehavior_80_3	We each benefit and earn in proportion to the efforts we put in.
S_RelBehavior_80_4	Our firm usually gets at least a fair share of the rewards and cost savings from our relationship with Strukton/Reef.
S_RelBehavior_80_5	Strukton/Reef would willingly make adjustments to help us out if special problems/needs arise.
S_RelBehavior_80_6	Strukton/Reef is flexible when dealing with our firm.
S_CollSpecialist_80_7	The collaboration with this supplier's operational/specialist department is very good.
	Profitability
	The relationship with Strukton/Reef ...
S_Profitability_90_2	... provides us with large sales volumes.
S_Profitability_90_3	... helps us to achieve good profits.
S_Profitability_90_4	... allows us to gain high margins.
S_Profitability_90_5	... has a positive influence on the profitability of our firm.
S_Profitability_90_6	... enables us to raise our profitability together.
	Customer Satisfaction
S_Satisfaction_100_1	Our firm is very satisfied with the overall relationship to Strukton/Reef.
S_Satisfaction_100_2	On the whole, our firm is completely happy with Strukton/Reef.
S_Satisfaction_100_3	Generally, our firm is very pleased to have Strukton/Reef as our business partner.
S_Satisfaction_100_4	If we had to do it all over again, we would still choose to use Strukton/Reef.
S_Satisfaction_100_5	Our firm does not regret the decision to do business with Strukton/Reef.
S_Satisfaction_100_6	Our firm is satisfied with the value we obtain from the relationship with Strukton/Reef.
	Preferred Customer Status
	Compared to other customers in our firm's customer base...
PC_PC_110_2	... Strukton/Reef is our preferred customer.
PC_PC_110_3	... we care more for Strukton/Reef.
PC_PC_110_4	... Strukton/Reef receives preferential treatment.
PC_PC_110_5	... we go out on a limb for Strukton/Reef.
PC_PC_110_6	... our firm's employees prefer collaborating with Strukton/Reef to collaborating with other customers.
	Preferential treatment
	Our firm...
PC_PrefTreat_120_1	... allocates our best employees (e.g. most experienced, trained, intelligent) to the relationship with Strukton/Reef.
PC_PrefTreat_120_3	... allocates more financial resources (e.g. capital, cash) to the relationship with Strukton/Reef.
PC_PrefTreat_120_4	... grants Strukton/Reef the best utilization of our physical resources (e.g. equipment capacity, scarce materials).
PC_PrefTreat_120_5	... shares more of our capabilities (e.g. skills, know-how, expertise) with Strukton/Reef.
	Operative excellece in execution phase
	Strukton/Reef...
ADD_Executionphase_171_1	...Is safety consencious at the construction site
ADD_Executionphase_171_2	...Pays variations promptly
ADD_Executionphase_171_3	Site staff has a cooperative attitude
ADD_Executionphase_171_4	...Properly notifies you of variations
ADD_Executionphase_171_5	...Coordinated activities between various sub-contractors in an efficient manner

Code	Question (ENG)
	Operative excellece in tender phase
	Strukton/Reef...
ADD_Tenderphase_170_1	...Provides all nesessary contract information on time
ADD_Tenderphase_170_2	...The tenderdocuements are comprehensive and clear in the allocation of responsibilities
ADD_Tenderphase_170_3	...Timely involves your firm for the tenderproces
ADD_Tenderphase_170_4	...Has sufficient knowledge about tenderprocedures to see it through
ADD_Tenderphase_170_5	...Listens and treats your ideas and suggestions on a fair and transparant manner.
	Critical succes factors for partnering
	How much influence do the following aspects have on you satisfaction in your relationship with buyingFirmXY?
ADD_CSF_partner_172_1	Mutual trust between client and supplier
ADD_CSF_partner_172_2	Alignment of goals and objectives.
ADD_CSF_partner_172_3	Actions consistent with objectives & partnering goals.
ADD_CSF_partner_172_4	Level and quality of communication (open & effective) form the client.
ADD_CSF_partner_172_5	Business attitude of the client.
ADD_CSF_partner_172_6	Commitment to win-win and fair allocation of profits.
ADD_CSF_partner_172_7	Provisions & commitment to continuous improvement.
ADD_CSF_partner_172_8	Working relationship
ADD_CSF_partner_172_9	Clear understanding and coordination of roles, responsibilities & tasks.
ADD_CSF_partner_172_10	Flexible with regard to changes.
ADD_CSF_partner_172_11	Dedicated team from the client
ADD_CSF_partner_172_12	Team building between client and supplier.
ADD_CSF_partner_172_13	Conflict identification & resolution
ADD_CSF_partner_172_14	Quality of agreements between client and supplier.
	Length of relationship (in years)
LNGTH_Relationship_230_1	How long has your company been a supplier of Strukton/Reef?
LNGTH_SupplierOfB_230_2	How long have you already been working as an employee of your firm?
LNGTH_EmployeeSupplier_230_3	How long have you already been acting as a sales representative for your company?
LNGTH_SalesRepresent_230_4	How long have you, as a representative of your firm, already been cooperating with Strukton/Reef?
	General information
ORG_Turnover_240_1	Annual Turnover (in €).
ORG_DepTurnover_240_2	Please indicate the annual turnover with Strukton/Reef as % of your total annual turnover (in %, 0=lowest, 100=highest)
ORG_Category_240_3	What is the market category of your company? (material/machinery rental/sub-contractor/ICT/consultant)
ORG_Company_240_4	With which company you worked the most of the time? (Strukton/Reef)
ORG_Size_240_3	How many employees does your company have?
ORG_TypeOwnership_248	What is the ownership structure of your company? [private/public/stock exchange]
ORG_InfluenceSpecs_242	How much influence does BuyingFirmXY have on your product/service design specifications? (in %, 0=lowest, 100=highest)
ORG_KnowledgeB_256_1	I know Strukton/Reef good enough to answer all the questions in this questionnaire

II. Descriptive statistics of the survey data

Indicator	Mean	SD	Variance	Skewness	Kurtosis
Contact accessibility	**3,39**				
S_Available_10_1	3,43	,889	,791	-,529	,126
S_Available_10_2	3,43	,875	,766	-,507	,244
S_Available_10_3	3,33	,890	,791	-,813	,577
Growth opportunity	**2,96**				
S_Growth_20_1	2,77	,806	,649	-,276	,456
S_Growth_20_2	3,15	,848	,719	-,038	-,503
S_Growth_20_3	3,00	,889	,790	,000	-,218
S_Growth_20_4	2,94	,880	,774	,121	-,114
Innovation potential	**2,70**				
S_InnovationPot_30_1	2,61	,913	,833	-,234	-,695
S_InnovationPot_30_2	2,51	,864	,747	-,274	-,593
S_InnovationPot_30_3	2,50	,805	,648	-,437	-,420
S_InnovationPot_30_4	2,91	,689	,474	-1,051	2,094
S_InnovationPot_30_5	2,98	,608	,370	-1,002	3,124
Operative excellence	**3,03**				
S_OperativeExc_40_1	3,10	,621	,385	-,381	3,063
S_OperativeExc_40_2	2,94	,880	,774	-,437	-,011
S_OperativeExc_40_3	3,21	,782	,611	-,543	,203
S_OperativeExc_40_4	3,02	,816	,666	-,744	,390
S_OperativeExc_40_5	3,33	,721	,520	-,389	,517
S_OperativeExc_40_6	2,61	1,141	1,303	,054	-1,095
Maturity	**3,69**				
S_Maturity_45_1	3,93	,562	,316	-,454	1,601
S_Maturity_45_2	3,46	,688	,474	-,215	-,214
S_Maturity_45_3	3,59	,785	,616	-,525	-,144
S_Maturity_45_4	3,79	,680	,463	-,441	,494
S_Maturity_45_5	3,66	,805	,647	-,899	1,759
Reliability	**3,62**				
S_Collaboration_50_1	3,51	,593	,352	,316	-,444
S_Collaboration_50_2	3,73	,686	,470	-1,010	2,624
S_Collaboration_50_3	3,57	,754	,569	-,344	,835
S_Collaboration_50_4	3,66	,613	,376	,354	-,629
Support of suppliers	**3,16**				
S_Support_60_1	3,24	,825	,681	-,756	,352
S_Support_60_2	3,09	,864	,746	-,167	,072
S_Support_60_3	3,15	,848	,719	-,287	,294

Involvement of suppliers	**2,94**				
S_Involvement_70_2	2,99	,762	,580	-,151	,153
S_Involvement_70_3	2,85	,803	,645	-,753	,504
S_Involvement_70_4	2,96	,853	,727	-,542	,373
Relational behaviour	**3,51**				
S_RelBehavior_80_1	3,46	,688	,474	-,447	-,266
S_RelBehavior_80_2	3,49	,671	,450	-,708	1,358
S_RelBehavior_80_3	3,68	,788	,621	-,931	1,251
S_RelBehavior_80_4	3,26	,750	,563	,257	,905
S_RelBehavior_80_5	3,38	,678	,460	-,150	-,292
S_RelBehavior_80_6	3,63	,746	,556	-,750	1,293
S_CollSpecialist_80_7	3,67	,721	,520	-,624	1,525
Profitability	**2,80**				
S_Profitability_90_2	2,73	,738	,544	-,470	,228
S_Profitability_90_3	2,72	,614	,377	-,409	,407
S_Profitability_90_4	2,61	,681	,463	-,771	,347
S_Profitability_90_5	2,89	,754	,568	-,702	,727
S_Profitability_90_6	3,02	,737	,543	-,608	,576
Preferred customer status	**3,18**				
PC_PC_110_2	3,24	,794	,631	-,318	,549
PC_PC_110_3	3,13	,828	,685	-,257	,540
PC_PC_110_4	3,06	,921	,848	-,026	,136
PC_PC_110_5	3,43	,817	,667	-,246	,147
PC_PC_110_6	3,01	,711	,506	-,018	1,506
Preferential treatment	**3,23**				
PC_PrefTreat_120_1	3,35	,776	,602	,262	-,197
PC_PrefTreat_120_3	2,96	,777	,604	,064	,424
PC_PrefTreat_120_4	3,24	,730	,532	,367	,138
PC_PrefTreat_120_5	3,35	,807	,651	,130	-,403
Supplier satisfaction	**3,77**				
S_Satisfaction_100_1	3,67	,817	,668	-,710	,774
S_Satisfaction_100_2	3,67	,802	,643	-,505	,709
S_Satisfaction_100_3	3,78	,667	,445	-,230	,151
S_Satisfaction_100_4	3,90	,730	,534	-,821	2,287
S_Satisfaction_100_5	4,06	,654	,428	-,332	,365
S_Satisfaction_100_6	3,54	,804	,647	-,414	,419
Professionalism in tender	**3,49**				
ADD_Tenderphase_170_1	3,89	,667	,445	,127	-,714
ADD_Tenderphase_170_2	2,95	,901	,812	-,110	,105
ADD_Tenderphase_170_3	3,66	,593	,351	,267	-,634
ADD_Tenderphase_170_4	3,51	,707	,500	-,259	-,164
ADD_Tenderphase_170_5	3,46	,613	,375	,308	-,215

Professionalism in execution	**3,44**				
ADD_Executionphase_171_1	3,55	,705	,498	-,826	1,343
ADD_Executionphase_171_2	3,41	,666	,443	-,450	1,214
ADD_Executionphase_171_3	3,23	,821	,674	-,457	,037
ADD_Executionphase_171_4	3,50	,572	,327	,203	-,615
ADD_Executionphase_171_5	3,52	,671	,450	-,091	-,147

Appendix C. Model 1

I. Factor analysis model 1: Supplier satisfaction/ preferred customer status

	1	2	3	4	5	6	7	8	9	10
S_Available_10_1	0,29	0,14	0,13	0,15	0,08	0,23	**0,82**	0,03	0,06	-0,02
S_Available_10_2	0,16	0,16	0,11	0,13	0,18	0,18	**0,85**	0,14	0,04	0,05
S_Available_10_3	0,17	0,28	0,07	0,12	0,03	0,06	**0,87**	0,06	0,06	0,09
S_Growth_20_1	-0,11	0,14	0,02	0,35	0,39	0,27	0,27	0,08	**0,44**	0,06
S_Growth_20_2	0,15	0,22	0,26	0,14	0,23	0,16	0,15	-0,02	**0,61**	0,31
S_Growth_20_3	0,12	0,16	0,17	0,25	0,20	0,26	-0,02	-0,01	**0,72**	-0,11
S_Growth_20_4	0,02	0,05	0,09	0,36	0,41	0,39	0,00	-0,15	**0,53**	0,05
S_InnovationPot_30_1	0,06	0,02	0,08	**0,76**	0,32	0,18	0,21	0,04	0,28	0,08
S_InnovationPot_30_2	-0,02	-0,03	0,13	**0,81**	0,19	0,14	0,20	0,07	0,28	0,11
S_InnovationPot_30_3	-0,04	0,01	0,19	**0,83**	0,18	0,13	0,12	0,06	0,14	0,13
S_InnovationPot_30_4	0,28	0,28	0,14	**0,70**	0,09	0,28	-0,01	0,03	-0,15	-0,16
S_InnovationPot_30_5	0,29	0,31	0,04	**0,64**	0,16	0,33	-0,12	0,13	0,00	-0,24
S_Collaboration_50_1	0,54	0,01	0,20	-0,03	0,26	0,23	0,26	**0,27**	-0,13	0,20
S_Collaboration_50_2	0,36	0,23	0,30	-0,06	0,14	0,01	0,07	**0,58**	0,13	-0,02
S_Collaboration_50_3	0,17	0,09	0,05	0,16	0,16	0,04	0,05	**0,86**	-0,06	0,11
S_Collaboration_50_4	0,36	0,14	0,13	0,02	0,08	0,13	0,12	**0,76**	-0,05	-0,04
S_Support_60_1	-0,03	0,30	0,19	0,24	0,00	**0,59**	0,13	0,42	0,20	0,19
S_Support_60_2	0,21	0,20	0,17	0,26	-0,06	**0,68**	0,21	0,24	0,28	-0,02
S_Support_60_3	0,20	0,16	0,21	0,24	-0,09	**0,75**	0,16	0,17	0,19	-0,08
S_Involvement_70_2	0,15	0,05	0,25	0,18	0,21	**0,71**	0,17	-0,12	0,07	0,20
S_Involvement_70_3	-0,03	0,17	0,48	0,39	0,23	**0,52**	0,10	-0,13	0,07	0,18
S_Involvement_70_4	0,06	0,19	0,47	0,30	0,11	**0,53**	0,21	0,00	0,08	0,16
S_RelBehavior_80_1	**0,65**	0,24	0,12	0,04	0,09	0,03	-0,05	0,18	-0,07	0,19
S_RelBehavior_80_2	**0,56**	0,40	0,18	0,13	0,17	0,00	0,08	0,24	0,20	-0,05
S_RelBehavior_80_3	**0,47**	0,25	0,31	0,00	0,18	0,06	0,04	0,32	0,25	0,04
S_RelBehavior_80_4	**0,19**	0,18	0,31	0,12	0,12	0,35	0,15	0,13	0,07	0,68
S_RelBehavior_80_5	**0,76**	0,07	0,19	0,05	-0,02	0,28	0,24	0,15	0,08	0,05
S_RelBehavior_80_6	**0,65**	0,30	0,23	0,05	0,16	-0,01	0,22	0,16	0,10	0,07
S_CollSpecialist_80_7	**0,78**	0,21	0,05	0,12	0,08	0,08	0,27	0,05	0,07	-0,19
S_Profitability_90_2	-0,01	0,09	**0,70**	0,16	0,33	0,19	0,15	0,25	0,00	-0,03
S_Profitability_90_3	0,07	0,15	**0,76**	0,19	-0,07	0,26	0,13	0,14	0,14	0,18
S_Profitability_90_4	0,24	0,06	**0,79**	0,01	0,09	0,27	0,09	0,07	0,06	-0,19
S_Profitability_90_5	0,36	0,16	**0,79**	0,12	-0,03	0,12	0,05	0,03	0,16	0,07
S_Profitability_90_6	0,31	0,28	**0,70**	0,10	-0,04	-0,04	-0,04	0,13	0,07	0,29
S_Satisfaction_100_1	0,27	**0,77**	0,11	0,26	0,09	0,09	0,12	0,14	0,18	0,04
S_Satisfaction_100_2	0,31	**0,74**	0,12	0,28	0,15	0,16	0,03	0,08	0,11	0,06
S_Satisfaction_100_3	0,28	**0,73**	0,15	0,04	0,14	0,06	0,19	0,10	0,17	0,08
S_Satisfaction_100_4	0,06	**0,71**	0,08	-0,12	0,31	0,21	0,31	0,02	0,02	0,07
S_Satisfaction_100_5	0,15	**0,77**	0,28	-0,02	0,17	0,15	0,18	0,17	-0,01	-0,05
S_Satisfaction_100_6	0,22	**0,34**	0,20	0,01	0,34	0,25	0,33	0,07	0,33	0,32
PC_PC_110_2	0,15	0,27	0,13	0,22	**0,70**	0,01	0,17	0,16	0,33	-0,06
PC_PC_110_3	0,10	0,23	0,01	0,25	**0,77**	-0,07	0,01	0,11	0,34	-0,01
PC_PC_110_4	-0,01	0,15	0,01	0,15	**0,81**	0,02	0,13	0,06	0,28	0,12
PC_PC_110_5	0,28	0,24	0,22	0,14	**0,62**	0,09	0,07	0,03	-0,08	-0,35
PC_PC_110_6	0,25	0,06	0,00	0,21	**0,73**	0,12	0,03	0,18	-0,19	0,20

Legend factor analysis
- = Included in the model
- = Excluded from the model due to low factor loading
- = Excluded from the model due to violation of quality criteria

II. Construct validity and reliability

Quality criteria	Composite reliability		Average variance extracted		Cronbach's alpha	
	Value	CI (2.5%)	Value	CI (2.5%)	Value	CI (2.5%)
Contact accessibility	0,961	0,936	0,891	0,830	0,939	0,898
Growth opportunities	0,898	0,850	0,746	0,654	0,830	0,739
Innovation potential	0,930	0,891	0,726	0,625	0,906	0,852
Preferred customer	0,914	0,863	0,682	0,576	0,882	0,805
Profitability	0,925	0,877	0,711	0,590	0,898	0,829
Relational behaviour	0,909	0,867	0,626	0,524	0,881	0,822
Reliability	0,900	0,832	0,751	0,626	0,836	0,719
Supplier satisfaction	0,936	0,901	0,745	0,648	0,914	0,863
Support/involve	0,933	0,891	0,698	0,579	0,913	0,860

III. VIF values

Inner VIF values	Preferred customer status	Supplier satisfaction
Contact accessibility	1.659	1.619
Growth opportunities	2.640	2.520
Innovation potential	2.405	2.397
Preferred customer		
Profitability	2.469	2.465
Relational behaviour	3.601	3.018
Reliability	2.305	2.297
Supplier satisfaction	2.523	
Support/involve	3.766	3.702

IV. Variance explained and Stone-Geiser Q2

Variance explained (R^2)	R^2
Preferred customer	0,502
Supplier satisfaction	0,531

Stone-Geiser Q^2	Communalities	Redundancies
Contact accessibility	0.644	
Growth opportunities	0.430	
Innovation potential	0.502	
Preferred customer	0.485	0.273
Profitability	0.508	
Relational behaviour	0.410	
Reliability	0.449	
Supplier satisfaction	0.560	0.331
Support/involve	0.511	

V. Discriminant validity

Discriminant validity (new constructs)	HTMT	CI (97.5%)
Growth opportunities -> Contact accessibility	0,372	0,614
Innovation potential -> Contact accessibility	0,390	0,587
Innovation potential -> Growth opportunities	0,686	0,814
Preferred customer -> Contact accessibility	0,372	0,575
Preferred customer -> Growth opportunities	0,643	0,820
Preferred customer -> Innovation potential	0,580	0,732
Profitability -> Contact accessibility	0,391	0,609
Profitability -> Growth opportunities	0,538	0,709
Profitability -> Innovation potential	0,448	0,654
Profitability -> Preferred customer	0,355	0,565
Relational behaviour -> Contact accessibility	0,532	0,708
Relational behaviour -> Growth opportunities	0,445	0,681
Relational behaviour -> Innovation potential	0,435	0,658
Relational behaviour -> Preferred customer	0,508	0,730
Relational behaviour -> Profitability	0,615	0,764
Reliability -> Contact accessibility	0,372	0,610
Reliability -> Growth opportunities	0,273	0,537
Reliability -> Innovation potential	0,354	0,561
Reliability -> Preferred customer	0,445	0,665
Reliability -> Profitability	0,518	0,704
Reliability -> Relational behaviour	0,722	0,844
Supplier satisfaction -> Contact accessibility	0,537	0,672
Supplier satisfaction -> Growth opportunities	0,542	0,726
Supplier satisfaction -> Innovation potential	0,463	0,655
Supplier satisfaction -> Preferred customer	0,578	0,771
Supplier satisfaction -> Profitability	0,535	0,686
Supplier satisfaction -> Relational behaviour	0,713	0,859
Supplier satisfaction -> Reliability	0,533	0,707
Support/involve -> Contact accessibility	0,525	0,669
Support/involve -> Growth opportunities	0,704	0,826
Support/involve -> Innovation potential	0,702	0,818
Support/involve -> Preferred customer	0,396	0,616
Support/involve -> Profitability	0,692	0,820
Support/involve -> Relational behaviour	0,517	0,697
Support/involve -> Reliability	0,430	0,650
Support/involve -> Supplier satisfaction	0,581	0,750

VI. OLS regression results

To assure the statistical correctness of the results from SmartPLS, the model is also calculated using SPSS. The table below shows the results of this analysis with the dependent construct supplier satisfaction. These results show that relational behaviour is the only significant antecedent of supplier satisfaction, which is consistent with the results from SmartPLS (see paragraph 8.1.1).

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,012	,081		-,146	,884
	Contact accessibility	,160	,099	,163	1,621	,109
	Growth opportunities	,157	,114	,153	1,374	,174
	Innovation potential	-,004	,113	-,004	-,035	,972
	Reliability	,072	,107	,072	,674	,502
	Support and involvement	,132	,134	,133	,988	,326
	Relational behaviour	,373	,118	,379	3,171	,002
	Profitability	,030	,114	,030	,261	,795

a. Dependent Variable: Supplier satisfaction

The second table shows the results for the dependent construct preferred customer status. These results show that growth opportunities, innovation potential, support and involvement and supplier satisfaction are antecedents of preferred customer status, which is in line with the results of the analysis in SmartPLS (see paragraph 8.1.1).

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,020	,082		,237	,813
	Contact accessibility	,047	,102	,047	,461	,646
	Growth opportunities	,440	,117	,422	3,761	,000
	Innovation potential	,309	,115	,303	2,698	,009
	Reliability	,204	,109	,198	1,870	,066
	Support and involvement	,305	,136	,302	2,242	,028
	Relational behaviour	,055	,127	,055	,434	,666
	Profitability	-,064	,115	-,064	-,558	,578
	Supplier satisfaction	,258	,118	,253	2,181	,032

a. Dependent Variable: Preferred customer status

Appendix D. Model 2

I. Factor analysis model 2: Contractor's operative excellence.

	1	2	3	4	5	6	7	8	9	10
S_Available_10_1	0,15	0,16	0,16	0,10	0,13	**0,86**	0,07	0,18	0,08	0,07
S_Available_10_2	0,13	0,16	0,11	0,18	0,15	**0,82**	0,15	0,16	0,04	0,03
S_Available_10_3	0,06	0,15	0,08	0,03	0,29	**0,87**	0,06	0,01	0,12	0,05
S_Growth_20_1	-0,07	0,45	0,00	0,39	0,18	0,21	0,04	0,23	0,05	**0,36**
S_Growth_20_2	0,25	0,19	0,28	0,30	0,15	0,18	-0,01	0,09	-0,03	**0,54**
S_Growth_20_3	0,11	0,31	0,19	0,23	0,13	-0,01	-0,01	0,16	0,11	**0,72**
S_Growth_20_4	0,02	0,40	0,12	0,43	0,05	0,04	-0,12	0,33	-0,06	**0,55**
S_InnovationPot_30_1	0,06	**0,78**	0,07	0,34	-0,01	0,20	0,05	0,13	0,02	0,20
S_InnovationPot_30_2	0,03	**0,85**	0,12	0,21	-0,05	0,16	0,06	0,10	-0,02	0,17
S_InnovationPot_30_3	0,03	**0,86**	0,16	0,17	0,01	0,09	0,06	0,09	-0,03	0,07
S_InnovationPot_30_4	0,13	**0,67**	0,17	0,06	0,26	0,05	0,08	0,16	0,24	-0,04
S_InnovationPot_30_5	0,11	**0,62**	0,07	0,14	0,31	-0,06	0,17	0,23	0,27	0,10
S_Collaboration_50_1	0,30	-0,04	0,25	0,27	-0,08	0,36	**0,37**	0,18	0,22	-0,09
S_Collaboration_50_2	0,37	-0,05	0,28	0,18	0,11	0,08	**0,59**	0,01	0,17	0,11
S_Collaboration_50_3	0,01	0,14	0,06	0,15	0,10	0,05	**0,86**	0,03	0,14	-0,05
S_Collaboration_50_4	0,15	0,01	0,14	0,08	0,12	0,15	**0,78**	0,11	0,25	-0,02
S_Support_60_1	0,11	0,31	0,19	-0,03	0,31	0,13	0,42	**0,53**	-0,04	0,24
S_Support_60_2	0,22	0,31	0,22	-0,05	0,17	0,27	0,28	**0,55**	0,04	0,35
S_Support_60_3	0,26	0,31	0,25	-0,08	0,13	0,20	0,20	**0,65**	0,06	0,24
S_Involvement_70_2	0,16	0,25	0,27	0,22	0,01	0,20	-0,07	**0,71**	0,06	0,06
S_Involvement_70_3	0,06	0,48	0,48	0,22	0,17	0,07	-0,13	**0,47**	0,04	0,02
S_Involvement_70_4	0,24	0,40	0,45	0,12	0,16	0,16	0,00	**0,50**	0,03	0,00
S_RelBehavior_80_1	0,26	0,05	0,13	0,09	0,17	0,04	0,18	0,00	**0,73**	-0,09
S_RelBehavior_80_2	0,28	0,15	0,19	0,20	0,33	0,12	0,23	-0,02	**0,61**	0,15
S_RelBehavior_80_3	0,24	0,03	0,29	0,22	0,17	0,06	0,32	0,10	**0,51**	0,16
S_RelBehavior_80_4	0,19	0,16	0,32	0,11	0,14	0,19	0,17	0,29	**0,11**	0,11
S_RelBehavior_80_5	0,34	0,04	0,25	0,01	-0,02	0,38	0,22	0,19	**0,59**	0,14
S_RelBehavior_80_6	0,55	0,04	0,25	0,25	0,13	0,28	0,23	-0,04	**0,32**	0,04
S_CollSpecialist_80_7	0,50	0,09	0,10	0,17	0,08	0,38	0,13	0,02	**0,44**	0,04
S_Profitability_90_2	-0,12	0,18	**0,69**	0,29	0,15	0,12	0,23	0,17	0,08	0,01
S_Profitability_90_3	0,06	0,23	**0,78**	-0,04	0,16	0,14	0,15	0,20	0,03	0,09
S_Profitability_90_4	0,11	0,03	**0,82**	0,08	0,04	0,13	0,09	0,21	0,16	0,11
S_Profitability_90_5	0,27	0,12	**0,80**	0,02	0,10	0,10	0,05	0,07	0,21	0,16
S_Profitability_90_6	0,34	0,09	**0,70**	0,01	0,20	-0,02	0,18	-0,11	0,09	0,05
PC_PC_110_2	0,20	0,27	0,10	**0,73**	0,22	0,13	0,14	0,00	0,10	0,22
PC_PC_110_3	0,06	0,26	0,01	**0,81**	0,20	0,01	0,10	-0,09	0,06	0,25
PC_PC_110_4	-0,12	0,19	-0,01	**0,80**	0,16	0,10	0,05	0,02	0,12	0,23
PC_PC_110_5	0,15	0,08	0,23	**0,63**	0,20	0,12	0,07	0,10	0,11	-0,02
PC_PC_110_6	0,08	0,19	0,04	**0,72**	0,04	0,10	0,25	0,11	0,06	-0,19
S_Satisfaction_100_1	0,37	0,24	0,13	0,13	**0,67**	0,17	0,16	0,03	0,12	0,20
S_Satisfaction_100_2	0,37	0,26	0,16	0,20	**0,65**	0,10	0,13	0,06	0,13	0,16
S_Satisfaction_100_3	0,39	0,05	0,19	0,21	**0,64**	0,25	0,15	-0,02	0,06	0,16
S_Satisfaction_100_4	0,15	-0,06	0,07	0,30	**0,70**	0,29	0,03	0,14	0,11	0,02
S_Satisfaction_100_5	0,26	0,00	0,25	0,18	**0,73**	0,16	0,13	0,16	0,18	-0,01
S_Satisfaction_100_6	0,22	0,05	0,23	0,36	**0,29**	0,37	0,10	0,18	0,08	0,36
ADD_Tenderphase_170_1	**0,58**	0,10	0,08	0,03	0,32	-0,11	0,05	0,32	0,21	-0,18
ADD_Tenderphase_170_2	**0,10**	0,21	0,19	0,36	0,09	0,04	0,45	-0,39	-0,10	-0,01
ADD_Tenderphase_170_3	**0,65**	-0,01	0,01	0,14	0,26	0,03	0,11	0,04	0,29	-0,18
ADD_Tenderphase_170_4	**0,56**	0,05	0,08	0,12	0,23	0,28	-0,01	0,13	0,20	-0,02
ADD_Tenderphase_170_5	**0,70**	0,17	0,03	-0,03	0,16	0,19	0,09	0,25	-0,14	0,06
ADD_Executionphase_171_1	**0,71**	0,14	0,17	-0,01	0,15	0,13	0,11	-0,01	0,05	0,22
ADD_Executionphase_171_2	**0,52**	0,05	0,26	-0,06	0,25	0,13	0,02	0,07	0,29	0,28
ADD_Executionphase_171_3	**0,51**	0,03	0,20	-0,05	0,04	0,25	-0,03	0,32	0,21	0,09
ADD_Executionphase_171_4	**0,76**	-0,05	0,16	0,01	0,11	-0,02	-0,01	0,12	0,13	0,09
ADD_Executionphase_171_5	**0,65**	0,02	0,00	0,11	0,17	0,06	0,32	-0,07	0,22	0,32

Legend factor analysis
- = Included in the model
- = Excluded from the model due to low factor loading
- = Excluded from the model due to violation of quality criteria

II. Construct reliability and validity

Quality criteria	Composite reliability		Average variance extracted		Cronbach's alpha	
	Value	CI (2.5%)	Value	CI (2.5%)	Value	CI (2.5%)
Contact accessibility	0,961	0,935	0,891	0,827	0,939	0,896
Contractors operative excellence	0,907	0,869	0,582	0,499	0,880	0,827
Growth opportunities	0,898	0,849	0,746	0,653	0,830	0,736
Innovation potential	0,930	0,893	0,726	0,629	0,906	0,853
Preferred customer status	0,914	0,864	0,682	0,575	0,882	0,805
Profitability	0,925	0,877	0,711	0,591	0,898	0,830
Relational behaviour	0,888	0,838	0,666	0,569	0,834	0,755
Reliability	0,900	0,833	0,751	0,628	0,836	0,714
Supplier satisfaction	0,936	0,903	0,745	0,651	0,914	0,864
Support/involve	0,933	0,892	0,698	0,581	0,913	0,860

III. Inner VIF values

Inner VIF values	Preferred customer status	Supplier satisfaction
Contact accessibility	1.586	1.518
Contractors operative excellence	3.399	2.968
Growth opportunities	2.651	2.586
Innovation potential	2.696	2.674
Preferred customer status		
Profitability	2.617	2.611
Relational behaviour	4.346	4.284
Reliability	2.333	2.300
Supplier satisfaction	2.777	
Support/involve	4.329	4.317

IV. Variance explained and Stone-Geiser Q2

Variance explained (R^2)	R^2
Preferred customer	0,579
Supplier satisfaction	0,519

Stone-Geiser Q^2	Communalities	Redundancies
Contact accessibility	0.644	
Contractors operative excellence	0.396	
Growth opportunities	0.430	
Innovation potential	0.502	
Preferred customer status	0.486	0.287
Profitability	0.508	
Relational behaviour	0.397	
Reliability	0.449	
Supplier satisfaction	0.560	0.357
Support/involve	0.511	

V. Discriminant validity

Discriminant validity (new constructs)	HTMT	CI (97.5%)
Contractors operative excellence -> Contact accessibility	0,463	0,623
Growth opportunities -> Contact accessibility	0,372	0,607
Growth opportunities -> Contractors operative excellence	0,500	0,703
Innovation potential -> Contact accessibility	0,390	0,580
Innovation potential -> Contractors operative excellence	0,340	0,603
Innovation potential -> Growth opportunities	0,686	0,816
Preferred customer status -> Contact accessibility	0,372	0,574
Preferred customer status -> Contractors operative excellence	0,303	0,594
Preferred customer status -> Growth opportunities	0,643	0,823
Preferred customer status -> Innovation potential	0,580	0,732
Profitability -> Contact accessibility	0,391	0,613
Profitability -> Contractors operative excellence	0,503	0,666
Profitability -> Growth opportunities	0,538	0,718
Profitability -> Innovation potential	0,448	0,657
Profitability -> Preferred customer status	0,355	0,566
Relational behaviour -> Contact accessibility	0,476	0,665
Relational behaviour -> Contractors operative excellence	0,728	0,883
Relational behaviour -> Growth opportunities	0,446	0,690
Relational behaviour -> Innovation potential	0,424	0,639
Relational behaviour -> Preferred customer status	0,486	0,718
Relational behaviour -> Profitability	0,635	0,784
Reliability -> Contact accessibility	0,372	0,614
Reliability -> Contractors operative excellence	0,480	0,700
Reliability -> Growth opportunities	0,273	0,541
Reliability -> Innovation potential	0,354	0,566
Reliability -> Preferred customer status	0,445	0,674
Reliability -> Profitability	0,518	0,706
Reliability -> Relational behaviour	0,729	0,856
Supplier satisfaction -> Contact accessibility	0,537	0,672
Supplier satisfaction -> Contractors operative excellence	0,717	0,834
Supplier satisfaction -> Growth opportunities	0,542	0,718
Supplier satisfaction -> Innovation potential	0,463	0,658
Supplier satisfaction -> Preferred customer status	0,578	0,772
Supplier satisfaction -> Profitability	0,535	0,691
Supplier satisfaction -> Relational behaviour	0,690	0,847
Supplier satisfaction -> Reliability	0,533	0,701
Support/involve -> Contact accessibility	0,525	0,672
Support/involve -> Contractors operative excellence	0,599	0,743
Support/involve -> Growth opportunities	0,704	0,827
Support/involve -> Innovation potential	0,702	0,823
Support/involve -> Preferred customer status	0,396	0,620
Support/involve -> Profitability	0,692	0,821
Support/involve -> Relational behaviour	0,528	0,712
Support/involve -> Reliability	0,430	0,651
Support/involve -> Supplier satisfaction	0,581	0,753

VI. OLS regression results

To assure the statistical correctness of the results from SmartPLS, the model is also calculated using SPSS. The table below shows the results of this analysis with the dependent construct supplier satisfaction including the new construct (contractors' operative excellence). These results show that the new construct is the only significant antecedent of supplier satisfaction, which is consistent with the results from SmartPLS (see paragraph 8.2.2).

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,005	,078		-,060	,952
	Contact accessibility	,167	,094	,171	1,786	,078
	Growth opportunities	,121	,111	,118	1,086	,281
	Innovation potential	,071	,112	,070	,631	,530
	Reliability	,097	,103	,096	,943	,349
	Support and involvement	-,007	,134	-,007	-,051	,960
	Relational_behaviour	,166	,120	,168	1,375	,173
	Profitability	,053	,110	,054	,484	,630
	Contractors operative excellence	,327	,111	,327	2,942	,004

a. Dependent Variable: Supplier satisfaction

The second table shows the results for the dependent construct preferred customer status. These results show that growth opportunities, innovation potential and supplier satisfaction are antecedents of preferred customer status, which is in line with the results of the analysis in SmartPLS (see paragraph 8.2.2).

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,017	,081		,209	,835
	Contact accessibility	,059	,099	,059	,593	,555
	Growth opportunities	,456	,116	,437	3,930	,000
	Innovation potential	,271	,116	,265	2,334	,022
	Reliability	,201	,107	,195	1,875	,065
	Support and involvement	,249	,139	,246	1,790	,078
	Relational_behaviour	,112	,126	,112	,886	,379
	Profitability	-,073	,115	-,072	-,636	,527
	Contractors operative excellence	,199	,122	,195	1,633	,107
	Supplier satisfaction	,329	,122	,323	2,696	,009

a. Dependent Variable: Preferred customer status

Appendix E. Replication of Vos et al. (2016)

I. Evaluation of the measurement model

The model that will be presented here is a replication of the model from the Vos et al. (2016) study.[242] The purpose of this replication is confirmatory and thus, no prior exploratory factor analysis is conducted in SPSS, only a confirmatory factor analysis in SmartPLS 3.0 is executed. Results of this confirmatory factor analysis show that the AVE of the relational behaviour construct is lower than the threshold of .50. Eliminating the indicators with the lowest loadings (indicator 1 & 7) result in an AVE above the threshold. Furthermore, indicator 1,2,3 of contractor's operative excellence (tender) are also deleted due to low indicator loadings.

Quality criteria	Composite reliability		Average variance extracted		Cronbach's alpha	
	Value	CI (2.5%)	Value	CI (2.5%)	Value	CI (2.5%)
Contact accessibility	0,961	0,933	0,890	0,824	0,939	0,894
Contractor's operative excellence	0,907	0,869	0,582	0,499	0,880	0,825
Growth opportunity	0,902	0,856	0,697	0,600	0,855	0,776
Innovation potential	0,929	0,891	0,726	0,630	0,906	0,854
Operative excellence	0,903	0,869	0,699	0,626	0,857	0,801
Preferential treatment						
Preferred customer status	0,914	0,869	0,683	0,579	0,882	0,807
Profitability	0,925	0,880	0,711	0,599	0,898	0,833
Relational behaviour	0,886	0,832	0,609	0,502	0,837	0,746
Reliability	0,889	0,825	0,668	0,546	0,834	0,731
Supplier satisfaction	0,931	0,899	0,692	0,599	0,910	0,865
Support/ Involvement	0,933	0,895	0,698	0,588	0,913	0,861

The assessment the quality criteria shows that 1 of the lower confidence intervals (2.5%) shows signs of values dropping below the respective thresholds of the criteria (lowest AVE is .499, lowest CR is .825 and lowest cr. alpha is .731). However, this is a minor difference and thus not expected to influence the results since the other quality criteria are sufficient. The PLSc algorithm shows that all HTMT are below the conservative threshold value of .85 (the highest HTMT is .81). Running the Bootstrapping procedure yields the confidence intervals for the HTMT. This shows that the upper confidence interval (97.5%) of the HTMT is above the threshold of .85 in five cases (highest is .9331). Therefore, the cross-loadings are examined. These show that all items have the highest loading on the construct it is linked

[242] See Vos et al. (2016), p. 4620.

to. Thus, discriminant validity is assumed to be no issue in the measurement model. The discriminant validity values are shown in appendix E.III.

II. Evaluation of the structural model

The highest inner VIF value between predictor constructs in the structural model is 6.002 and therefore above the conservative threshold of 5 but below the maximum value of 10.[243] The other values are well below the threshold.

Inner VIF	**Relational behaviour**	**Supplier satisfaction**
Contact accessibility		
Contractor's operative excellence		3,215
Growth opportunity		1.736
Innovation potential		
Operative excellence		2.668
Preferential treatment		
Preferred customer status		
Profitability		2.289
Relational behaviour		6.002
Reliability	1.323	
Supplier satisfaction		
Support/ Involvement	1.323	

The path coefficients, p-values and effect sizes are shown in below.

Path coefficients and significance (two-tailed & α = .05)	Path coefficient	P Values	Effect sizes (f^2)
Contact accessibility -> Operative excellence	0,585	0,000	0,521
Contractor's operative excellence -> Supplier satisfaction	0,315	0,000	0,128
Growth opportunity -> Supplier satisfaction	0,189	0,039	0,062
Innovation potential -> Growth opportunity	0,648	0,000	0,724
Operative excellence -> Supplier satisfaction	0,160	0,105	0,034
Preferred customer status -> Preferential treatment	0,726	0,000	1,111
Profitability -> Supplier satisfaction	0,046	0,469	0,003
Relational behaviour -> Supplier satisfaction	0,258	0,032	0,059
Reliability -> Relational behaviour	0,544	0,000	0,543
Supplier satisfaction -> Preferred customer status	0,560	0,000	0,457
Support/ involvement -> Relational behaviour	0,328	0,000	0,197

[243] See Hair et al. (2014), p. 170.

For assessing the predictive relevance of the model, the R^2 is assessed together with the Stone-Geiser Q^2.[244] The results are shown below.

Predictive relevance (R^2)	**R^2**
Growth opportunity	0,420
Operative excellence	0,342
Preferential treatment	0,526
Preferred customer status	0,314
Relational behaviour	0,559
Supplier satisfaction	0,614

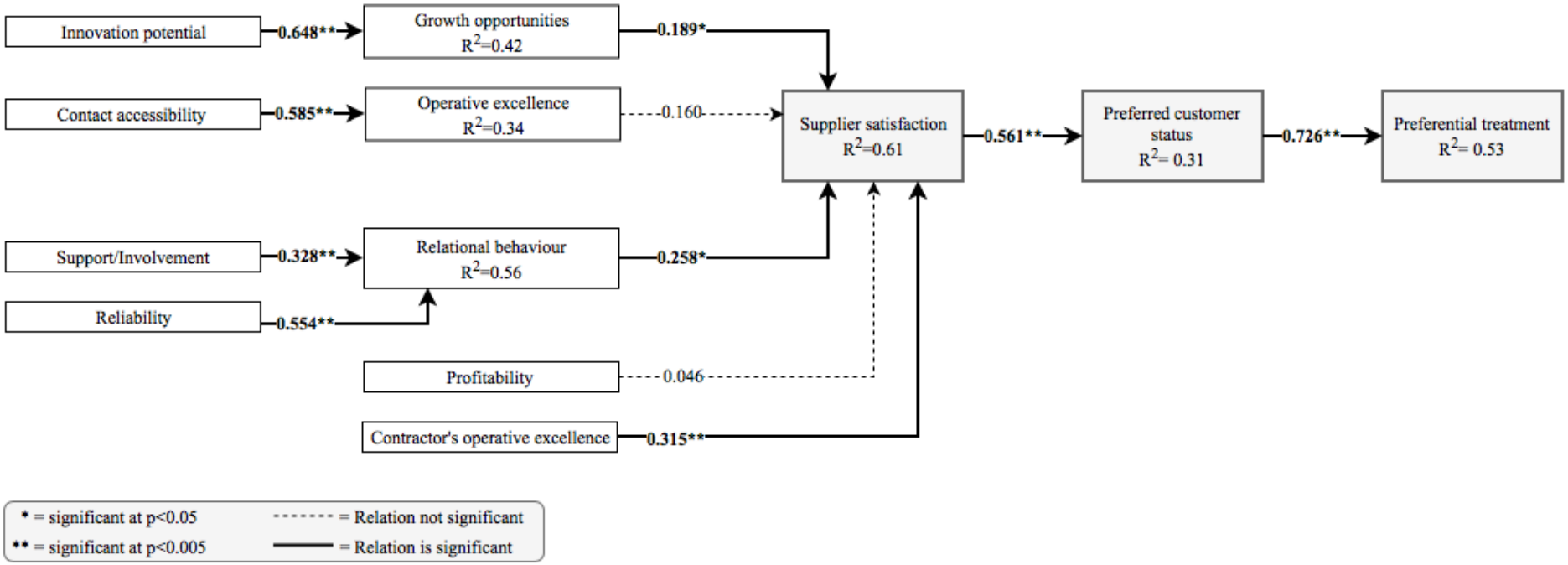
Stone-Geiser Q^2	Communalities	Redundancies
Contact accessibility	0.666	
Contractor's operative excellence	0.426	
Growth opportunity	0.472	0.274
Innovation potential	0.557	
Operative excellence	0.472	0.218
Preferential treatment	0.347	0.290
Preferred customer status	0.495	0.188
Profitability	0.533	
Relational behaviour	0.401	0.300
Reliability	0.432	
Supplier satisfaction	0.535	0.347
Support/ Involvement	0.550	

Both measures for predictive relevance show that the model has predictive power (R^2>0.2 and Q^2>0). Lastly, the model fit is examined. All fit indexes show that the original value is well above the upper confidence interval showing a poor fit of the overall model (SRMR & D_Uls). A visual representation of the model is shown on the next page.

Model fit criteria	SRMR		D_Uls		D_g1		D_g2	
	Value	CI (97.5%)	Value	CI (97.5%)	Value	CI (97.5%)	Value	CI (97.5%)
Saturated	0.079	0.081	10.726	11.290	15.137	1501.223	13.586	n/a
Estimated	0.132	0.103	29.896	18.122	16.391	1494.655	14.595	n/a

[244] See Geisser (1974); Hair et al. (2014), p. 175-178.

Replication of Vos et al. (2016)



Based on the analysis of the measurement and structural model, it can be concluded that the overall structural model shows a poor fit. Especially the estimated model shows poor fit. The saturated model fit shows that there are other relations in the model which are not present in the estimated model.

III. Discriminant validity replication study

Discriminant validity	HTMT	CI (97.5%%)
Contractor's operative excellence -> Contact accessibility	0,463	0,624
Growth opportunity -> Contact accessibility	0,422	0,639
Growth opportunity -> Contractor's operative excellence	0,482	0,699
Innovation potential -> Contact accessibility	0,390	0,587
Innovation potential -> Contractor's operative excellence	0,340	0,603
Innovation potential -> Growth opportunity	0,720	0,845
Operative excellence -> Contact accessibility	0,644	0,796
Operative excellence -> Contractor's operative excellence	0,536	0,751
Operative excellence -> Growth opportunity	0,616	0,801
Operative excellence -> Innovation potential	0,810	0,908
Preferred customer status -> Contact accessibility	0,372	0,574
Preferred customer status -> Contractor's operative excellence	0,303	0,591
Preferred customer status -> Growth opportunity	0,676	0,829
Preferred customer status -> Innovation potential	0,580	0,731
Preferred customer status -> Operative excellence	0,523	0,698
Profitability -> Contact accessibility	0,391	0,605
Profitability -> Contractor's operative excellence	0,503	0,669
Profitability -> Growth opportunity	0,501	0,673
Profitability -> Innovation potential	0,448	0,646
Profitability -> Operative excellence	0,634	0,779
Profitability -> Preferred customer status	0,355	0,559
Relational behaviour -> Contact accessibility	0,572	0,728
Relational behaviour -> Contractor's operative excellence	0,808	0,931
Relational behaviour -> Growth opportunity	0,558	0,750
Relational behaviour -> Innovation potential	0,493	0,692
Relational behaviour -> Operative excellence	0,737	0,882
Relational behaviour -> Preferred customer status	0,535	0,740
Relational behaviour -> Profitability	0,723	0,844
Reliability -> Contact accessibility	0,441	0,654
Reliability -> Contractor's operative excellence	0,539	0,736
Reliability -> Growth opportunity	0,320	0,582
Reliability -> Innovation potential	0,378	0,575
Reliability -> Operative excellence	0,610	0,798
Reliability -> Preferred customer status	0,487	0,682
Reliability -> Profitability	0,568	0,728
Reliability -> Relational behaviour	0,809	0,916
Supplier satisfaction -> Contact accessibility	0,583	0,711
Supplier satisfaction -> Contractor's operative excellence	0,739	0,851

Supplier satisfaction -> Growth opportunity	0,613	0,765
Supplier satisfaction -> Innovation potential	0,480	0,661
Supplier satisfaction -> Operative excellence	0,665	0,828
Supplier satisfaction -> Preferred customer status	0,618	0,787
Supplier satisfaction -> Profitability	0,569	0,717
Supplier satisfaction -> Relational behaviour	0,791	0,911
Supplier satisfaction -> Reliability	0,589	0,734
Support/ involvement -> Contact accessibility	0,525	0,673
Support/ involvement -> Contractor's operative excellence	0,599	0,744
Support/ involvement -> Growth opportunity	0,719	0,831
Support/ involvement -> Innovation potential	0,702	0,818
Support/ involvement -> Operative excellence	0,659	0,800
Support/ involvement -> Preferred customer status	0,396	0,612
Support/ involvement -> Profitability	0,692	0,819
Support/ involvement -> Relational behaviour	0,647	0,793
Support/ involvement -> Reliability	0,485	0,670
Support/ involvement -> Supplier satisfaction	0,620	0,783