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Important factors influencing maturity perception

A research to identify possible factors which are important for the maturity perception of suppliers ~ A case from a financial services organisation

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Acknowledgements

Dear reader,

In front of you, you find my Master Thesis. This Master Thesis is the final project in completing my Master Business Administration at the University of Twente. It has been a challenging project in which I obtained much knowledge about doing research. Most of all, I learned a lot about myself. The completion of this project and my Master was not easy and without the help of many people it would not work out well. These people support me which I would like to thank them for.

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Abstract

Maturity perception is an important factor for suppliers to award preferred customer status. Previous research hardly states some antecedents important for maturity perception. Maturity is the level of professionalism and sophistication of the purchasing function. This research knows two points of attention. On the one hand factors are identified to see what suppliers perceive as maturity. On the other hand, the difference is measured between the maturity perception of suppliers and the actual maturity level. Therefore, the actual maturity level is also measured in this research by use of a maturity model. The maturity model of Schiele (2007) is adapted to make it suitable for service organisations as literature also suggests. Among others, a contract management sub dimension is added in this maturity model. The adjusted maturity model and the identification of important factors for maturity perception are tested in a financial services organisation.

At first, a survey is conducted at suppliers to find out what factors are important in the maturity perception of suppliers. Four factors are identified by use of an analysis in Partial Least Square path modelling software. Contact accessibility, innovation potential, reliability and involvement are confirmed to have a positive relation with the maturity perception of suppliers. Subsequently, the maturity level is measured. The results of the factors that have an influence on maturity perception are compared with results from the maturity model to identify a possible difference. Suppliers perceive maturity more positive than buyers themselves. However, important to notice is the exploratory character of the comparison of the results as measurement instruments are not fully enough aligned to make a clear and proper comparison. Therefore, further research should be conducted with two, better aligned, measurement instruments. This research is unique because it identifies factors important for maturity perception of suppliers. Additionally, it connects the maturity perception of suppliers to the actual maturity level of purchasing. To the best of our knowledge, this is the first research in doing an attempt to identify a possible link.

List of abbreviations

AVE = Average Variance Extracted

CB = Co-Variance Based

CFA = Confirmatory Factor Analysis

CR = Composite reliability

HTMT = Hetrotrait-monotrait

(M)ANOVA = (Multivariate) Analysis of Variance

NPD = New Product Development

NPR = Non-Product Related

PLS = Partial Least Square

SEM = Structural Equation Modelling

SET = Social Exchange Theory

VIF = Variance Inflation Factor

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1. The unidentified link between maturity and how suppliers perceive maturity

In the last few decades, the position of purchasing has started to change from a function to buy as cheap as possible towards a more strategic function.[1] Also, the importance of the role of suppliers in organisations is increasing more and more.[2] Consequently, the collaborative relation between supplier and buyer is becoming of great value.[3] Because of the more strategic function of purchasing, organisations "outsource non-critical activities, establish close 'partnership' relationships with suppliers and reduce and trim their supplier base" more often.[4] Therefore buyers need to maintain their relationships with suppliers very well.

Several topics are important to maintain a good relationship. Two of these topics in relationships with suppliers, strategic purchasing and supplier satisfaction, are shortly introduced. Subsequently, the third and main topic of this research is discussed; maturity perception. At first, strategic purchasing is important in maintaining the relationship with suppliers. Paulraj, Chen and Flynn (2006) characterise strategic purchasing as "the strategic focus, strategic involvement of the purchasing function and the status and visibility of the purchasing professionals".[5]A high level of strategic purchasing is positively related to organisation[6] and financial[7] performance. For a buyer it is easier to maintain long-term relationships with suppliers as the buyer reaches a high level of strategic purchasing. Secondly, satisfied suppliers are important for a buyer in the buyer-supplier relationship. Supplier satisfaction can be characterised by the positive opinion of the supplier about the positive evaluation of expectations from the relationship with the buyer.[8] According to the research of Vos, Schiele and Hüttinger (2016), supplier satisfaction can obtain competitive advantage because "supplier satisfaction positively impacts the supplier's tendency to award preferred customer status, and ultimately give preferential treatment to buyers".[9] As soon as a supplier is satisfied with its relation with the buyer he is more likely to assign a preferred customer status. This motivation can be supported with the Social Exchange Theory (hereinafter called as SET).[10] In SET, "A person for whom another has done a service is expected to express his gratitude

[1] See Gadde/Håkansson (1994), p.27.
[2] See Gadde/Snehota (2000), p. 305.
[3] See Ulaga/Eggert (2006), p.119.
[4] Gadde/Snehota (2000), p. 306.
[5] Paulraj/Chen/Flynn (2006), p.107.
[6] See Paulraj/Chen/Flynn (2006), p.118.
[7] See Carr/Pearson (1999), p.516.
[8] See Schiele/Calvi/Gibbert (2012), p.1181 as well as Hüttinger/Schiele/Schroër (2014), p.703.
[9] Vos/Schiele/Hüttinger (2016), p.4621.
[10] See Vos/Schiele/Hüttinger (2016), p.4615.

and return a service when the occasion arises".[11] So, if a buyer meets or exceeds the expectations of the supplier, the supplier is more likely to make relational investments.[12]

The research of Bemelmans, Voordijk, Vos and Dewulf (2015) states the effect of supplier satisfaction on preferred customer status from another perspective. They state it is an advantage to gain preferred customer status as this has a positive effect on the buyer's satisfaction about the collaboration with the supplier.[13] In that research also another factor seemed very important; how the supplier perceives the maturity of the buyer. Maturity can be described best as the reflection of professionalism and sophistication of the purchasing function in an organisation.[14] According to Rozemeijer, van Weele and Weggeman (2003), this purchasing maturity is "expressed in status of the function, role, organizational status of the purchasing department, availability of purchasing information systems, quality of people involved in purchasing, and level of collaboration with suppliers".[15] An internal driver to reach a high maturity level is that high maturity and savings potential are positively related to each other.[16] Additionally, an external reason to work on maturity is that suppliers sooner award preferred customer status as they perceive the relationship with the buyer as mature. [17] Lack of purchasing maturity is a sign of internal organisational weaknesses and therefore suppliers do not award preferred customer status fast.[18] The buyer is not an attractive (preferred) customer in case of a low maturity level . Bemelmans et al. (2015) also concluded that as soon as a buyer is satisfied, he also behaves more mature to a supplier which results in a supplier who perceives a high maturity level.[19] As their research is limited because it is tested only in the construction industry and they have had a limited amount of cases, this needs to be tested in other industries.[20]

Therefore, it is interesting to further investigate the maturity perception of suppliers as this influences the decision of suppliers on whether or not to award preferred customer status. This research focuses on maturity perception of the suppliers; how they perceive it and how it differs from the actual maturity level. So, the main research question in this research is:

RQ "What do suppliers perceive as maturity of purchasing?"

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[11] Blau (1986), p.4.
[12] See Nyaga/Whipple/Lynch (2010), p.111; Pulles/Schiele/Veldman/Hüttinger (2016), p.131 as well as Vos/ Schiele/Hüttinger (2016), p.4615.
[13] See Bemelmans/Voordijk/Vos/Dewulf (2015), p.194.
[14] See Rozemeijer/vanWeele/Weggeman (2003), p.5; Schiele (2007), p.274 as well as Úbeda/Alsua/Carrasco (2015), p.178.
[15] Rozemeijer/Weele/Weggeman (2003), p.10.
[16] See Schiele (2007), p.283.
[17] See Bemelmans/Voordijk/Vos/Dewulf (2015), p.194.
[18] See Steinle/Schiele (2008), p.11 as well as Bemelmans/Voordijk/Vos/Dewulf (2015), p.181.
[19] See Bemelmans/Voordijk/Vos/Dewulf (2015), p.194.
[20] See Bemelmans/Voordijk/Vos/Dewulf (2015), p.195.

As this is a general research question, further specific research direction is given to this question by use of two sub questions. The first sub question and part of the research is about the factors important for suppliers to perceive maturity. Maturity perception[21] and supplier satisfaction[22] are considered to be very important factors in obtaining a preferred customer status. Several authors already conducted research to factors that are important to supplier satisfaction.[23] Prior research is scarce about important factors which influence the maturity perception of suppliers. Now, the first sub question arises. This question investigates which important factors are perceived as mature by suppliers in the organisation of their buyers:

SQ1 "Which factors influence the supplier its perception of the buyer its maturity?"

The factors which influence the supplier its perception of the buyer's maturity are investigated in SQ1. Managers can work on these specific factors to increase the maturity perception of their suppliers. Ultimately, a high maturity perception can lead to competitive advantages like preferred customer status as said before.

However, a supplier is not part of an organisation and therefore only sees selectively how the buying organisations operate. Consequently, it could be the case that the actual maturity level of purchasing differs from the maturity perception of suppliers. To the best of our knowledge, the link between maturity perception of suppliers and actual maturity level of a purchasing function is hardly investigated before. This results in the question whether this maturity perception of the supplier matches the actual maturity level of purchasing. Therefore the actual maturity level needs to be measured. This maturity level can be measure by use of a maturity model.

Maturity models are suitable tools to assess this level of professionalism and sophistication of the purchasing function within an organisation.[24] However, previous research on maturity models suggested to take a look at the maturity assessment for service organisations as this was not covered in that research.[25] What can also be derived from that research is that the resulting level of a maturity model may differ depending on the type of organisation.[26] The previous mentioned topic strategic purchasing is also part of the maturity of purchasing.[27] Strategic purchasing research suggests involving the supplier organisations for data collection in further research because this

[21] See Bemelmans/Voordijk/Vos/Dewulf (2015), p.194.
[22] See Vos/Schiele/Hüttinger (2016), p.4621.
[23] See Hüttinger/Schiele/Schöer (2014), p.711 as well as Vos/Schiele/Hüttinger (2016), p.4618.
[24] See Schiele (2007), p.274 as well as Úbeda/Alsua/Carrasco (2015), p.178.
[25] See Schiele (2007), p.283.
[26] See Schiele (2007), p.283.
[27] See Schiele (2007), p.276.

strengthens validity.[28] Additionally, services-oriented constructs are proposed to add in further research and next to test them within a sample of service organisations.[29]

Moreover, the need for service constructs also increases of importance because of the movement from a 'product-dominant view' towards a 'service-dominant view'.[30] On the one hand in a so-called 'product-dominant view' the "tangible output and discrete transactions" are central point of attention. [31] On the other hand "intangibility, exchange processes, and relationships" are fundamental in a 'service-dominant view'.[32] In this change of needs, a grey area exists between goods and services since in most cases goods are needed to provide a service.[33] Because of the shift from a 'product-dominant view' towards a 'service-dominant view', organisations also purchase more services. Organisations outsource a lot more internal services and collaborate more with suppliers to add value to the service an organisation provides.[34]

Sheth and Sharma point out several issues which can have a crucial role in purchasing of services but these issues needed to be addressed in further research.[35] A possible issue they address is the possible difference between a product and a service in the way they are consumed and how they are standardised.[36] Van der Valk and Rozemeijer (2009) notice difference between product and service purchasing as well.[37] Intangibility of services makes it difficult to assess the quality of the deliverable beforehand.[38] Also the fact that services are produced and consumed at the same time makes the buyer co-producer and therefore it is difficult to separate responsibilities of buyer and supplier.[39] The human factor within services is also crucial which makes it difficult to control the value delivered.[40] Lastly, services are not storable which causes planning and forecasting of the demand difficult.[41]

Bowen and Ford (2002) argue as well that organisations that provide mainly products (hereinafter called as product organisations) and organisations that provide mainly services (hereinafter called as service organisations) have different production processes and different management styles.[42] So, providing mainly services or mainly goods requires a different type of

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[28] See Carr/Pearson (1999), p.515 as well as Paulraj/Chen/Flynn (2006), p.119.
[29] See Paulraj/Chen/Flynn (2006), p.119.
[30] See Rogelio/Kallenberg (2003), p.160; Davies (2004), p.727; Prahalad/Ramaswamy (2004), p.6; Vargo/Lusch (2004), p.2 as well as Vargo/Lusch (2008), p.254.
[31] Vargo/Lusch (2004), p.2.
[32] Vargo/Lusch (2004), p.2.
[33] See Gallouj/Weinstein (1997), p.543; Pine/Gilmore (1999), p.8 as well as Vargo/Lusch (2004), p.13.
[34] See Sheth/Sharma (1997), p.99.
[35] See Sheth/Sharma (1997), p.99.
[36] See Sheth/Sharma (1997), p.99.
[37] See vanderValk/Rozemeijer (2009), p.4.
[38] See vanderValk/Rozemeijer (2009), p.4.
[39] See vanderValk/Rozemeijer (2009), p.4.
[40] See Ellram/Tate/Billington (2004), p.17-18.
[41] See vanderValk/Rozemeijer (2009), p.4.
[42] See Bowen/Ford (2002), p.465.

organisational design and therefore also a different purchasing approach. Service organisations often purchase Non-Product-Related (hereinafter called as NPR) purchases where product organisations purchase for about 30% NPR.[43] The remaining 70% of the purchasing budget of a product organisation is spent to primary processes.[44]

So, the maturity model which is used to measure the actual maturity level should beneficially also be adapted. The shift from a 'product-dominant view' towards a 'service-dominant view' and the differences as product/service purchasing and NPR/primary purchasing might be reason to adapt the current maturity models which are mostly product focused. Schiele (2007) already suggested that his maturity model needs to be tested in a service organisation and that it might require a different set of criteria.[45] So, the question rises what needs to be adapted in the current maturity models to make them applicable for a service organisation:

> *SQ2 "What adjustments need to be made in the current maturity models to make it suitable for a service organisation?"*

As soon as factors which have an impact on maturity perception of suppliers and the actual maturity level are clear, the outcomes are compared to see if both views match.

The purpose of this research is threefold. On the one hand this research contributes to literature to identify some important factors in how suppliers perceive maturity of their buyers. The identified factors could be used by managers as starting points to work on to increase their maturity perception of suppliers and ultimately gain preferred customer status sooner. On the other hand, a current maturity model suitable for product organisations is adapted to service organisations. By use of literature some first adjustments are made and tested to see if these adjustments are applicable on a service case company. This leads to recommendations for further directions of research about what needs to be improved in the current maturity models to make them applicable for service organisations. For the case company, some practical recommendations are drawn from the results of the maturity model. Lastly, the actual maturity level is compared to the perceived maturity model to see if they are congruent or not. The contribution of identifying a difference can help to determine, in further research, how much effort buyers need to do in order to increase their suppliers' maturity perception on them.

One case company is used to determine important factors for maturity perception of suppliers and to test the adjusted maturity model. Next chapter starts with determining definitions regarding the constructs services and products in order the make the focus of this research clearer

[43] See deBoer/Holmen/Pop-Sitar (2003), p.911.
[44] See deBoer/Holmen/Pop-Sitar (2003), p.911.
[45] See Schiele (2007), p.283.

and to explain the need of different maturity models. Subsequently, a literature study is executed to compose the required measurement tools and approaches for the survey and maturity model. The hypotheses, research design, sampling strategy, data collection and an introduction into the case company are presented in chapter 5 and 6. The survey study is of quantitative character and identifies factors important for maturity perception. These factors are presented in the results of the quantitative part in chapter 7. Subsequently, the results of the maturity model derived from the interviews are shown in chapter 8. The comparison of the quantitative survey results and the qualitative interview results are presented in chapter 9. The last two chapters respectively show a discussion and implications and limitations and suggestions for further research.

2. The different industries of products and services

2.1 Tangible goods vs. intangible services

As mentioned in the introduction, this research sets focus on service organisations. Beforehand, a clear definition of products and services need to be stated. Another topic regarding the difference between products and services that needs to be taken into consideration is the way a product or service organisation is designed and managed. As soon as a difference exists between the two types of organisations, that, most likely causes the necessity for different maturity models. Therefore this chapter points out differences between products and services and in the end comes up with a definition for this research. In that context, at first the different types of economic offerings organisations provide are outlined in this paragraph. The next paragraph (2.2) discusses the differences in design and management of the two types of organisations.

Organisations primarily provide goods or services. Different authors characterise goods as tangible and services as intangible.[46] Pine and Gillmore (1999) define goods as "(…) tangible items sold to largely anonymous customers who buy them off the shelf, from the lot, out of the catalog, and so on."[47] Furthermore, services are described as "intangible activities customized to the individual request of known clients."[48] Goods are the tangible parts to perform intangible services.[49] The intangible part of services comprises the direct application of knowledge and skills at the moment when both consumption and production take place.[50] Hence, the distinction between goods and services is not black and white.[51] When identifying services as intangible there is still a wide variety in kind of services.[52] To make a more specific division, Pine and Gilmore (1999) distinct four kinds of economic offerings: commodities, goods, services and experiences.[53] Table 1 Economic Distinctions, reprinted from Pine and Gillmore (1999, p.6), shows the different characteristics of each economic offering.[54]

[46] See Pine/Gilmore (1999), p.6; Bowen/Ford (2002), p.447 as well as Vargo/Lusch (2004), p.2.
[47] Pine/Gilmore (1999), p.7.
[48] Pine/Gilmore (1999), p.8.
[49] See Gallouj/Weinstein (1997), p.543; Pine/Gilmore (1999), p.8 as well as Vargo/Lusch (2004), p.13.
[50] See Gallouj/Weinstein (1997), p.543; Vargo/Lusch (2004), p.2 as well as vanderValk/ Rozemeijer (2009), p.4.
[51] See Pine/Gilmore (1999), p.8.
[52] See Bowen/Ford (2002), p.448.
[53] See Pine/Gilmore (1999), p.2.
[54] See Pine/Gilmore (1999), p.6.

Table 1 Economic Distinctions

Economic Offering	Commodities	Goods	Services	Experiences
Economy	Agrarian	Industrial	Service	Experience
Economic function	Extract	Make	Deliver	Stage
Nature of offering	Fungible	Tangible	Intangible	Memorable
Key attribute	Natural	Standardized	Customized	Personal
Method of supply	Stored in bulk	Inventoried after production	Delivered on demand	Revealed over a duration
Seller	Trader	Manufacturer	Provider	Stager
Buyer	Market	User	Client	Guest
Factors of demand	Characteristics	Features	Benefits	Sensations

Contradictory, Hill (1999) does not see the distinction of tangible goods and intangible services as clear as the authors mentioned before. According to Hill (1999), the ownership rights take care of the distinction of goods and services.[55] Hill (1999), states that "The essential characteristics of a good are that it is an entity over which ownership rights may be established and from which its owner(s) derives some economic benefit."[56] Goods cannot only be tangible but also intangible, as Hill (1999) argues.[57] These intangible goods are "originally produced as outputs by persons, or enterprises, engaged in creative or innovative activities of a literary, scientific, engineering, and artistic or entertainment nature."[58] Intangible goods are originated by persons or enterprises and subsequently duplicated in order to sell these intangible goods to customers. On the other hand, services arise from the relationship between producers and customers.[59] Services cannot be traded independently because both producer and customer are needed for the provision of the service.[60] Therefore the ownership rights cannot be assigned over a service.[61] As services are produced and consumed at the same time, they cannot for example been made in one country and transported to another country.[62] In case of products, like computers this is possible. To conclude, Hill (1999) stated that:

> "Intangibles should also not be interpreted as products that lie in some twilight zone between goods and services, blurring the distinction between them. They have all the essential economic characteristics of goods. The traditional dichotomy between goods and services can be preserved provided intangibles are grouped with tangible goods."[63]

[55] See Hill (1999), p.437.
[56] Hill (1999), p.437.
[57] See Hill (1999), p.437.
[58] Hill (1999), p.438.
[59] See Hill (1999), p.441.
[60] See Hill (1999), p.442 as well as vanderValk/Rozemeijer (2009), p.4.
[61] See Hill (1999), p.442.
[62] See Hill (1999), p.442.
[63] Hill (1999), p.445.

In this paper needs to be clear what the difference is between a product and service as the focus is on services. As seen in the division of economic offerings by Pine and Gillmore (1999) four different types can be identified; commodities, goods, services and experiences.[64] The categorisation of commodities and goods from the division by Pine and Gillmore (1999) are identified as "goods" in this paper. The remaining two of this categorisation, services and experiences, are recognised as "services" in this research. This distinction is made by taking the opinions of Hill (1999), Bowen and Ford (2002), Vargo and Lusch (2004) into consideration. For example, a few authors state that production and consumption takes place at the same time with services.[65] This can be translated to the characteristics from the categorisation of Pine and Gillmore (1999) in which services are customised and delivered on demand instead of delivery from inventory. The most important characteristic which makes the division clear is tangible versus intangible.[66] To summarise; tangible goods have a storage possibility, there is no co-production with the customer and the ownership is tradable. On the other hand intangible services, produced by use of tangible goods, are created and consumed at the same time, the customer is co-producing and there is no tradable ownership as both customer and producer are creating it together.

Resulting from the choice to only make a distinction between goods and services, also two kinds of organisations are distinguished: product organisations and service organisations. According to Bowen and Ford (2002), "distinctions between service organizations and product organizations are getting more difficult to make as most companies produce both intangible and tangible products."[67] So, on the one hand the division is made in 'product organisations' that produce mainly tangible products and on the other hand 'service organisations' that produce mainly intangible services.[68] The next paragraph discusses the differences in organisational design, management and purchasing in these two types of organisations.

2.2 Differences in organisational design and management resulting from the economic offering provided: product vs. services

As mentioned in the previous paragraph, the scope of this research is on service organisations which mainly produce services. Therefore differences in organisational design, management and more specific purchasing, need to be known between product and service organisations. Goods are tangible and can therefore be stored when there is no customer demand at that time. Contradictory, services are intangible and cannot be stored, which results in production and consumption at the

[64] See Pine/Gilmore (1999), p.6.
[65] See Gallouj/Weinstein (1997), p.543 as well as Vargo/Lusch (2004), p.2.
[66] See Pine/Gilmore (1999), p.6; Bowen/Ford (2002), p.447 as well as Vargo/Lusch (2004), p.2.
[67] Bowen/Ford (2002), p.449.
[68] See Bowen/Ford (2002), p.449.

same time.[69] These main differences between goods and services have effect on the way organisations are managed. This paragraph describes several differences in managing a product organisation or a service organisation. Quality and value assessment, production process and purchasing activities are discussed to show general differences between the two types of organisations.

At first the quality and value assessment of a product or service organisation is different. Product organisations are able to measure quality and value in an objective way because of competing products[70], standardisation[71] and production without customer involvement.[72] So, the management of a product organisation is able to measure value, quality and efficiency in the quantity they have produced; the amount of raw materials, work-in-progress and finished inventory in stock.[73] The quality and value in a service organisation is harder to measure in an objective way. The customer is involved within the production process which results in a subjective assessment of quality and value: "It does not matter if organizational efficiency measures, the cost accountants, or the production engineers all affirm the excellence of the organization's service experience, if the customer does not perceive it that way."[74] In a production organisation this quality and value can be assessed better because products are tangible and therefore suitable for objective assessment where services are intangible and the quality and value assessment more relies on the experience of the customer.[75]

Subsequently, in the production process of a product or service organisation differences are visible as well. In a product organisation the tangible goods are produced and have the possibility to be stored. This is possible because there is no direct customer demand needed to produce the tangible goods which are (often) standardised.[76] In case of a service, the customer is a co-producer which requires production and consumption at the same time, so services cannot be produced in advance.[77] Employees are an important factor within this production process of services.[78] Knowledge and skills need to be developed in order to reach the maximum result.[79] Therefore, "employees have to learn how to manage and work with customers who are co-producing the product with them."[80] For example, the ability to build proper customer relationship is an important

[69] See Bowen/Ford (2002), p.449-450.
[70] See Bowen/Ford (2002), p.450 as well as Vargo/Lusch (2004), p.5.
[71] See Bowen/Ford (2002), p.450 as well as Vargo/Lusch (2004), p.5.
[72] See Vargo/Lusch (2004), p.5.
[73] See Bowen/Ford (2002), p.450.
[74] Bowen/Ford (2002), p.450.
[75] See Bowen/Ford (2002), p.450.
[76] See Bowen/Ford (2002), p.450 as well as Vargo/Lusch (2004), p. 5.
[77] See Bowen/Ford (2002), p.456.
[78] See Ellram/Tate/Billington (2004), p.17-18.
[79] See Vargo/Lusch (2004), p.5.
[80] Bowen/Ford (2002), p.456.

capability that employees need to poses and develop.[81] At last, service employees have a bigger chance for facing conflicts because the customer is co-producing and therefore a higher chance of misunderstanding exists.[82]

Regarding the purchasing function, several differences exist in the arrangement of purchasing in the two types of organisations and what influence this has on the purchasing process. One can look at purchasing from two perspectives; from the perspective of buying a service and the perspective of all products and services purchased by a service organisation. At first the perspective of buying a service is discussed. Sheth and Sharma point out that many studies focus on product purchasing and not on service purchasing.[83] Purchasing services can have crucial differences compared to product purchasing, like the time of consumption.[84] Three points have been found specifically important in purchasing a service. The intention of customer contact, the level of customisation and the level of collaboration between the two parties, are necessary to understand well before purchasing a service.[85] The second perspective is the purchasing range of a service organisation. Service organisations and governmental organisations purchase mostly 'non-product related purchases'.[86] According to de Boer, Holmen and Pop-Sitar (2003), 'non-product related purchases' (hereinafter called as NPR purchases) "include all goods and services other than those used in an organization's primary operations".[87] Examples of NPR purchases are facility related purchases like buildings, cleaning service and copiers and other services like insurance, telecommunications, and external lawyers.[88] Product organisations have much fewer NPR purchases as they have a huge amount of purchasing in their primary operations (e.g. raw materials).[89] Large product organisations spend for about 30% of their total purchasing budget to NPR purchases and the remaining part to their primary operations.[90]

To conclude this chapter, this paper is focusing on services and service organisations that produce mainly services. A service is considered to be intangible, produced with tangible products, co-produced with the customer, produced and consumed at the same time and ownership rights are not tradable. An organisation that provides mainly services is determined to be a service organisation in this research. Purchasing in a service organisation comprises all purchasing activities regarding (mostly) NPR purchases.[91] Therefore in this research only NPR purchases are

[81] See Bowen/Ford (2002), p.460 as well as Vargo/Lusch (2004), p.5.
[82] See Bowen/Ford (2002), p.459-462.
[83] See Sheth/Sharma (1997), p.99.
[84] See Sheth/Sharma (1997), p.99 as well as vanderValk/Rozemeijer (2009), p.4.
[85] See vanderValk/Axelsson (2015), p. 119.
[86] See deBoer/Holmen/Pop-Sitar (2003), p.911.
[87] deBoer/Holmen/Pop-Sitar (2003), p.911.
[88] See deBoer/Holmen/Pop-Sitar (2003), p.911.
[89] See de Boer/Holmen/Pop-Sitar (2003), p.911.
[90] See deBoer/Holmen/Pop-Sitar (2003), p.911.
[91] See deBoer/Holmen/Pop-Sitar (2003), p.911.

taken into account. Because a difference exists in purchasing for a product organisation and a service organisation, the current maturity models which focus mainly on purchases from primary operations, should be reviewed to become suitable for service organisation that do mostly NPR purchases.

3. The importance of buyer-supplier relationships and the way suppliers perceive maturity

3.1 Importance of buyer-supplier relationships

As mentioned in the introduction, several authors conducted research to the link between strategic purchasing, buyer-supplier relationships and the financial and organisational performance of an organisation.[92] Strategic purchasing makes it easier to maintain long-term relationships with suppliers and this has a positive effect on the financial performance of a firm.[93] These authors suggest involving the supplier organisations for data collection in further research because this strengthens validity.[94] Additionally, services-oriented constructs are proposed to add and to test them within a sample of service organisations.[95] Besides strategic purchasing, supplier satisfaction is also very important in the relation with a supplier. Supplier satisfaction positively relates to obtaining a preferred customer status.[96] Another research showed that suppliers sooner gain a preferred customer status as soon as the buyer is perceived as mature.[97] Therefore, this research investigates if there is any possible link between maturity of purchasing and maturity perception of suppliers. The following sub-question is proposed in the introduction and is investigated in this chapter:

SQ1 "Which factors influence the supplier its perception of the buyer its maturity?"

At first, this paragraph describes the extern relationships purchasing departments need to maintain: the relationship with the supplier. Also the factors that influence the buyer-supplier relationship are addressed. These factors could possibly reflect the maturity of a purchasing department and how suppliers perceive this maturity.

The relationship between buyer and supplier can result in gaining preferred customer status from the supplier to the buyer. This preferred customer status comprehends a preferential treatment by the supplier to the buyer.[98] Preferred customer status can be a beneficial competitive advantage for organisations as it gains preferential access to resources.[99] Important criteria for suppliers to give their customer the preferred customer status embrace the technical importance, commercial

[92] See Carr/Pearson (1999), p.497 as well as Paulraj/Chen/Flynn (2006), p.118.
[93] See Carr/Pearson (1999), p.516 as well as Paulraj/Chen/Flynn (2006), p.118.
[94] See Carr/Pearson (1999), p.515 as well as Paulraj/Chen/Flynn (2006), p.119.
[95] See Paulraj/Chen/Flynn (2006), p.119.
[96] See Vos/Schiele/Hüttinger (2016), p.4613.
[97] See Bemelmans/Voordijk/Vos/Dewulf, (2015), p.194.
[98] See Schiele (2012), p.44 as well as Vos/Schiele/Hüttinger (2016), p.4613
[99] See Schiele (2012), p.44.

importance, cultural fit, past preferential treatment and key account status of a customer.[100]

From the buyer side, supplier satisfaction is of major importance.[101] According to Schiele, Calvi and Gibbert (2012), "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".[102] The research of Hüttinger, Schiele, Schroër (2014) has a similar definition for supplier satisfaction: "a positive affective state resulting from an overall positive evaluation of the aspects of a supplier's working relationship with the buying firm".[103] So, supplier satisfaction is the positive opinion of the supplier about meeting or exceeding the expectations in a positive evaluation of the relationship between buyer and supplier. The research of Vos et al. (2016) proved that supplier satisfaction has a positive effect in obtaining preferred customer status, which results in preferential treatment in the end.[104] The constructs that are used in the research of Vos et al. (2016) to measure supplier satisfaction are (1) growth opportunity, (2) innovation potential, (3) operative excellence, (4) reliability, (5) support, (6) involvement, (7) access to contacts, (8) relational behaviour and (9) profitability.[105] From those nine constructs, three relational constructs ((3) operative excellence, (4) reliability and (8) relational behaviour) show a higher influence on supplier satisfaction than two economic constructs ((1) growth opportunity and (9) profitability).[106]

The buying organisation needs to fulfil the expectations of the supplier to receive preferred customer status. However, when not meeting the expectations of a supplier, the buying organisation can still gain preferred customer status or the other way around.[107] Overall, a preferred customer status mainly depends on supplier satisfaction and customer attractiveness.[108]

3.2 Maturity perception by suppliers

For suppliers, it is important to perceive maturity before they award preferred customer status to their buyer. The research of Bemelmans et al. (2015) showed that as soon as a buyer is being perceived mature by a supplier, the supplier will award a preferred customer status to that buyer sooner.[109] This preferred customer status also has a positive effect on the buyer, it will perceive more satisfaction in the relationship with the supplier as soon as it has a preferred customer status. The previous paragraph already showed that a preferred customer status can gain preferential

[100] See Schiele (2012), p.48.
[101] See Vos/Schiele/Hüttinger (2016), p.4613.
[102] Schiele/Calvi/Gibbert (2012), p.1181.
[103] Hüttinger/Schiele/Schroër (2014, p.703.
[104] SeeVos/Schiele/Hüttinger (2016), p.4613.
[105] See Vos/Schiele/Hüttinger (2016), p.4615.
[106] See Vos/Schiele/Hüttinger (2016), p.4621.
[107] See Pulles/Schiele/Veldman/Hüttinger (2016), p.136.
[108] See Pulles/Schiele/Veldman/Hüttinger (2016), p.129.
[109] See Bemelmans/Voordijk/Vos/Dewulf (2015), p.194.

treatment in resource allocation.[110] Thus, it would be beneficial to know what is perceived as mature by suppliers in order to improve these specific factors and sooner appear mature by the suppliers.

Little literature is available about which factors influence the maturity perception of suppliers. Bemelmans et al. (2015) conducted research to factors that could be beneficial in obtaining preferred customer status. They concluded that as soon as a buyer is perceived as mature by its suppliers, suppliers can award preferred customer status sooner.[111] To make sure suppliers perceive buyers as mature, clear communication is necessary to convince the supplier of the buyer's capabilities which is also key part of customer attractiveness.[112] Three parts were involved in the interviews which are conducted in the Bemelmans et al. (2015) research. Two of these parts are important to take into account in this research. At first, a maturity assessment of supplier relationship management is examined. In this maturity assessment, several topics are covered: (1) communication, (2) cooperation and goals, (3) management participation, (4) involvement (improvement/ development programmes) and (5) information sharing.[113] The topics of this maturity assessment of supplier relationship management are of great importance for this research as they indicate mature points in the relationship between buyer/supplier. Existing antecedents for preferred customer status and collaboration satisfaction are debated in the subsequent part of the interviews of Bemelmans et al. (2015): (1) attractiveness and satisfaction, (2) recent relationship developments, (3) relationship specific investments, (4) preferential resource allocation and treatment and (5) innovation/improvement suggestions. The researchers questioned if it is also applicable in other industries as their research only investigated two construction supply chains.[114] The industry of this research is different because it is a service organisation and therefore it is a good opportunity to see if it holds in this industry.

The topics which are used in the research of Bemelmans et al. (2015) show lot comparisons with the topics of the research of Hüttinger et al. (2014) and Vos et al. (2016). However, the research of both Hüttinger et al. (2014) and Vos et al. (2016) are not about factors important for perceiving maturity but supplier satisfaction[115] and customer attractiveness[116]. Not much additional literature is found to indicate other important factors for maturity perception. Therefore the previous discussed purchasing literature about important factors for supplier satisfaction, collaborative relationships and customer attractiveness is used to deduct some factors which can be of importance for the perceiving of maturity. Additionally, satisfaction and collaborative

[110] See Schiele (2012), p.44.
[111] See Bemelmans/Voordijk/Vos/Dewulf (2015), p.194.
[112] See Bemelmans/Voordijk/Vos/Dewulf (2015), p.194.
[113] See Bemelmans/Voordijk/Vos/Dewulf, (2015), p.186.
[114] See Bemelmans/Voordijk/Vos/Dewulf (2015), p.195.
[115] See Hüttinger/Schiele/Schroër (2014), p.712 as well as Vos/Schiele/Hüttinger (2016), p.4614.
[116] See Hüttinger/Schiele/Schroër (2014), p.712.

relationships reflect the opinion of the behaviour/impression of the supplier about the buyer. For that reason, literature about these topics is consulted for this research as maturity perception is an impression of the buyer as well. The research of Vos et al. (2016) is already tested and proved in several industries.[117] Besides, it is the most recent research of important antecedents for supplier satisfaction. So, the constructs which are used by Vos et al. (2016) are the starting point for this research to find out important factors for maturity perception.

[117] See Vos/Schiele/Hüttinger (2016), p.4621.

4. Maturity model that is applicable for a service organisation

4.1 The professionalism of a purchasing department: the maturity model from a scientific point of view

Current literature has mostly studied the purchasing maturity in product organisations and suggested for further research, to do this as well in service organisations.[118] Especially, if the desired maturity level needs to be the same for a service organisation is questioned.[119] Main difference between a product organisation and service organisation is that service organisations often do NPR purchases where product organisations purchase mostly for their primary operations and only do for about 30% NPR purchases.[120] The current maturity profiles may need an adaption to be suitable for service organisations, because of this difference in the way they purchase. As already mentioned in the introduction, this raises the following question which is answered in this chapter:

> *SQ2 "What adjustments need to be made in the current maturity models to make it suitable for a service organisation?"*

This chapter starts with an outline of the maturity model of Schiele (2007) because he offers an excellent review in his research.[121] Schiele stated that "to the best of our knowledge, this is the most extensive purchasing maturity profile application ever reported."[122] After that a brief overview is given of maturity models after Schiele (2007). Subsequently in the last paragraph, maturity models from practice are discussed which are provided and distributed by consultancy agents and unions like NEVI as well as other relevant literature.

'Maturity' reflects the professionalism and sophistication of the purchasing function in an organisation.[123] Maturity models are suitable tools in order to assess this maturity of purchasing and see how professional and sophisticated they operate.[124] According to Schiele (2007), "a maturity model describes several - auditable – stages an organisation is expected to go through in its quest for greater sophistication."[125] The data collected by use of a maturity profile is highly reliable because the several stages of maturity are described extensively which causes a low chance for

[118] See Schiele (2007), p.283.
[119] See Schiele (2007), p.283.
[120] See deBoer/Holmen/Pop-Sitar (2003), p.911.
[121] See Schiele (2007), p.277.
[122] Schiele (2007), p.279.
[123] See Rozemeijer/vanWeele/Weggeman (2003), p.5; Schiele (2007), p.274 as well as Úbeda/Alsua/Carrasco (2015), p.178.
[124] See Schiele (2007), p.274 as well as Úbeda/Alsua/Carrasco (2015), p.178.
[125] Schiele (2007), p.274.

misunderstanding.[126] A completed maturity profile also directly shows the actions needed for improvement and therefore offers a high managerial relevance to an organisation.[127] Main reason for an organisation to work towards a high maturity level is because high maturity is positively related to savings potential.[128]

About twelve authors made conceptual maturity models but none of them empirically tested them.[129] For this reason, Schiele (2007) conducted both a conceptual maturity model and an empirical foundation by testing it at organisations.[130] In the first place, Schiele (2007) compared several maturity profiles of other authors in his research and composed a maturity profile out of this comparison.[131] The maturity profile he presents in his 2007 article is already an improved version of earlier work and test results.[132] In Figure 1 Comparison of maturity models, adapted from Schiele (2007, p.277), an overview is shown of maturity models Schiele (2007) compared and in the last column is stated what he used in his model.

	Reck / Long (1988)	Bhote (1989)	Free-man / Cavi-nato (1990)	Keough / Camish (1991)	Keough (1993)	Burt / Doyle (1994)	Chad-wick / Raja-gopal (1995)	Barry et al. (1996)	Paulraj et al. (2006)	Cou-sins et al. (2006)	**Model pre-sented by Schiele (2007)**
Scope	general purchasing							MRO pur-chases	**general purchasing**		
No. of stages	4	4	4	4	5	4	4	3	3	4	**4**
No. of items for assessment	11	24	9	8	8	33	9	20	42	24	**111**
Topics addressed:											
Planning	∨	∨	∨	∨	∨	∨	∨	∨			∨
Structural organization		∨		∨	∨	∨	∨				∨
Process organisation		∨		∨	∨		∨	∨			∨
Human resources	∨		∨	∨	∨	∨	∨			∨	∨
Controlling	∨	∨	∨			∨	∨	∨	∨	∨	∨
Collaborative supply relation	∨	∨				∨	∨		∨	∨	

Figure 1 Comparison of maturity models

[126] See Schiele (2007), p.275.
[127] See Schiele (2007), p.275.
[128] See Schiele (2007), p.283.
[129] See Schiele (2007), p.274.
[130] See Schiele (2007), p.275.
[131] See Schiele (2007), p.276.
[132] See Schiele (2007), p.278.

Out of this comparison of approximately ten maturity models (see Figure 1 Comparison of maturity models), Schiele (2007) composed a management-oriented maturity profile.[133] He selected five dimensions in his maturity profile: "(1) procurement planning, (2) the structural organisation of the purchasing function, (3) process organisation and purchasing's embeddedness in the firm, (4) established human resource systems and leadership models in procurement and (5) purchasing controlling structures."[134] One dimension, collaborative supply relation was not taken into account because this is difficult to extract from a management model.[135] In this maturity profile, four stages of maturity can be reached.[136] The lowest stage encompasses just the presence of a tool to perform the activity, where the highest stage involves a cross-functional integration in an organisation.[137]

From his research, Schiele (2007) established a positive relationship between the maturity of a purchasing department and the impact on its performance; high mature organisations can benefit from larger savings.[138] He also showed that low mature organisations may fail in the implementation of best practices to obtain larger savings.[139] The maturity scores of the assessed organisations varied from 36% to 55% on a 100% scale.[140] Hence, an average savings potential of 7.3% can be achieved.[141] Besides the positive relationship between maturity and financial performance, another relationship is confirmed within his research. Organisations which execute more extensive supplier development activities score a higher maturity level.[142] Next paragraph contains a brief review of the maturity models presented after Schiele (2007).

4.2 Maturity models after 2007: Literature Review

After the work of Schiele (2007), several other maturity models might have been published. To search for them in a systematic way, several search terms related to maturity are filled in often used databases like Scopus Web of Science and Google Scholar. In Table 2 Search results, an overview is shown of what search terms are used and of how many useful articles this generated. From these search results, several articles seemed useful based on the abstract. A limited number of useful articles remained after reading. The search results contained a lot of stock market/loans/currency related articles probably because of the economics filter in combination with maturity (of market). Selection during reading was specifically based on articles which include maturity models/questions and/or service related topics. In the end this lead to five useful articles which are

[133] See Schiele (2007), p.277.
[134] Schiele (2007), p.276.
[135] See Schiele (2007), p.276.
[136] See Schiele (2007), p.278.
[137] See Schiele(2007), p.278.
[138] See Schiele (2007), p.281.
[139] See Schiele (2007), p.281.
[140] See Schiele (2007), p.280.
[141] See Schiele (2007), p.280.
[142] See Schiele (2007), p.282.

compared in Table 3 Results maturity models after 2007. Other articles were eliminated because they used maturity models that were already existing or demonstrated relationships in constructs regarding to maturity.

Table 2 Search results

Source	*Search term*	*Number of results*	*Useful based on abstract*	*Useful after reading*
Scopus	Maturity purchasing (in subject area business management and accounting, economics, econometrics and finance, after 2007)	24	8	5
Scopus	Maturity profile (in subject area business management and accounting, economics, econometrics and finance, after 2007)	61	1	0
Scopus	"Maturity model" and purchasing (in subject area business management and accounting, economics, econometrics and finance, after 2007)	4	4 (4 same as before)	3 (3 same as before)
Web of science	Maturity purchasing (in subject area business, management, economics and public administration, after 2007)	59	7 (4 same as before)	3 (3 same as before)
Web of science	Maturity profile (in subject area business, management, economics, after 2007)	26	1	0
Web of science	Maturity model and purchasing (in subject area business management and accounting, economics, econometrics and finance, after 2007)	5	3 (3 same as before)	2 (2 same as before)
Google Scholar	Maturity purchasing (all words in title, after 2007)	22	6 (4 same as before)	1 (1 same as before)
Google Scholar	Maturity profile (all words in title, after 2007)	49	0	0
Google Scholar	Maturity model and purchasing (all words in title, after 2007)	3	0	0
Total		201	15	5

What can be concluded from Table 3 Results maturity models after 2007; the same kinds of topics are always used in maturity models like processes and strategies. Another remarkable outcome is that half of the maturity models are specifically made for the construction industry. As this industry is not part of the research, these models are not replacing the baseline model of Schiele (2007) which is used in this research. The remaining two maturity models are not covering the purpose of this research adequately. The model of Foerstl, Hartmann, Wynstra and Moser (2012) is used to find relationships between performance indicators and maturity.[143] For the constructs of that research they based questions on maturity models. They also have a small maturity assessment but not as it is intend to in this paper. The last article about maturity models is from Úbeda, Alsua and Carrasco (2015). Their maturity model builds further on the maturity model of Schiele et al. (2007) and is also not applicable for a specific industry.[144] Similarly as Schiele (2007), Úbeda et al. (2015) define, purchasing maturity as "a measure of the degree to which a purchasing department is advanced, sophisticated, and professional."[145] In contrast to Schiele his (2007) maturity model which was tested in just one sector to avoid bias[146], the maturity model of Úbeda et al. (2015) was tested across different sectors.[147] Also in this research high maturity is positively related to

[143] See Foerstl/Hartmann/Wynstra/Moser (2014), p.689.
[144] See Úbeda/Alsua/Carrasco (2015), p.178.
[145] Úbeda/Alsua/Carrasco (2015), p.178.
[146] See Schiele (2007), p.278.
[147] See Úbeda/Alsua/Carrasco (2015), p.181.

savings.[148] Úbeda et al. (2015) question if the maturity needs to be the same for every type of organisation similar to Schiele (2007).[149] In the end, the profile of Schiele (2007) is continuously improved. The most recent version of the maturity profile of Schiele (2007) is retrieved and used as a baseline for this research.[150] The next paragraph outlines maturity models which are used in practice, because only scarce literature exists of the service related purchasing maturity models.

Table 3 Results maturity models after 2007

Article	*Main dimensions*	*Number of stages*	*Specific point of attention*	*Empirical research*
Meng, Sun & Jones, 2011	• Procurement • Objectives • Trust • Collaboration • Communication • Problem solving • Risk allocation • Continuous improvement	• Level 1 Price competition • Level 2 Quality competition • Level 3 Project Partnering • Level 4 Strategic partnering/alliance	Model for construction industry/ supply chain	Evaluated by use of interviews, tested in one organisation in construction industry
Foerstl, Hartmann, Wynstra & Moser, 2012	• Cross-functional integration • Functional coordination • Talent management Performance management	• Basic practice (1) • (2) Medium practice (3) • (4) Advanced practice (5)	General purchasing maturity model, but focus is more to make constructs out of maturity models to identify links	148 samples from different industries by use of interviews, survey and secondary data
Bemelmans, Voordijk & Vos, 2013	• Operational purchasing • Tactical purchasing • Strategic purchasing • Decentralisation • Coordination • Centralisation • Internal collaboration • External collaboration • Multidisciplinary • Segmentation • Supplier base optimisation • Reactive actions • Proactive actions • Formalisation • Integrated IS/IT • Performance indicators • Developed purchasing workforce • Purchasing plans • Integrated strategy • Gain and risk sharing	• Transactional orientation • Commercial orientation • Purchasing coordination • Internal integration • External integration • Value chain integration	Dimensions are mentioned as characteristics in their research and are linked to the stages, assessment specific for construction industry	Tested at one organisation in construction industry
Versendaal, van den Akker, Xing & de Bevere, 2013	• Goals and strategy • Control • Process • Organisation • Information • E-Technology	• Transactional orientation • Commercial orientation • Purchasing coordination • Internal integration • External integration	Model for construction industry including IT alignment	Tested at one organisation in construction industry
Úbeda, Alsua & Carrasco, 2015	• Strategy • People • Organisation process/ activities • Suppliers • Communication	• Level 1 • Level 2 • Level 3 • Level 4 • Level 5	General purchasing maturity model, based on Schiele (2007)	Tested in 278 Chilean organisations from different industries by use of a survey

[148] See Úbeda/Alsua/Carrasco (2015), p.183.
[149] See Schiele (2007), p.283 as well as Úbeda/Alsua/Carrasco (2015), p.179.
[150] See Schiele (2007) as well as Schumacher/Schiele/Contzen/Zachau (2008).

4.3 The adjustments for a maturity model for a service organisation: possibilities from literature and practice

From the previous paragraph can be concluded that there is hardly any empirical research of maturity profiles, especially not in a service organisation environment. Schiele argues that service organisations "may require a different set of maturity criteria" as product organisations require.[151] Service purchasing requires a different approach as product purchasing where service purchasing is about purchasing intangibles, production and consumption at the same time and once they are purchased they cannot be stored.[152] The current maturity profiles need to be adapted so that they are suitable for a service organisation because of that difference. Purchase union NEVI and consultancy group NIC also provide information regarding maturity of purchasing. The possible adjustments that derive from those practical sources are mentioned in this paragraph. Besides, scientific literature is also taken into account to find characteristics of purchasing services.

Organisations outsource more non-critical activities nowadays.[153] Many internal services which are not the specialty of the organisation are outsourced to organisations specialised in those services.[154] The arrangement of purchasing a service is captured in a contract to guarantee a certain service level. These contracts are mostly for a long-term period. According to Chou and Chou (2009), "an outsourcing contract defines the provision of services and charges that need to be completed in a contracting period between two contracting parties."[155] The need for proper contract management is crucial because a complete contract minimises "ambiguity, confusion and unidentified and immeasurable conditions/terms."[156] The activities that are necessary to compose a successful contract include (1) the identification of the outsourcing need, (2) planning and strategic setting, (3), vendor selection process, (4) negotiation/contracting process, (5) transitioning process, (6) project execution and (7) project assessment.[157] Another important aspect in contract management is to identify possible risks since outsourcing a service ensures a certain dependency, like loss of control of the supplier.[158] Mature risk management processes can contribute in making outsourcing projects successful.[159]

The NIC Group composed the "Nederlands Intergraal Contractmanagement Volwassenheidsmodel (NICV model)". [160] This is a maturity model focused on the contract

[151] Schiele (2007), p.283.
[152] See vanderValk/Rozemeijer (2009), p.4.
[153] See Gadde/Snehota (2000), p.306 as well as Ellram/Tate/Billington (2004), p.19.
[154] See Ellram/Tate/Billingrton (2004), p.19.
[155] Chou/Chou (2009), p.1037.
[156] Chou/Chou (2009), p.1037.
[157] See Chou/Chou (2009), p.1038-1039.
[158] See Chou/Chou (2009), p.1039-1040.
[159] See Chou/Chou (2009), p.1038.
[160] See NIC as referred by Bos (2014), p.15-16.

management part of an organisation.[161] The NICV model contains five constructs and five possible levels of maturity. The constructs used are (1) policy, (2) processes, (3) systems, (4) human resources and (5) suppliers.[162] The five possible levels of maturity vary from having basic processes to cross-functional integration with suppliers.[163] NEVI used this model as well. They composed a few practical questions regarding contract management.[164] In these specific contract management questions they addressed four categories; governance, service delivery, relation management and contract administration.[165] These questions of NEVI are used to create four new questions regarding contract management in the existing model of Schiele (2007). So, these categories are used as four different questions for the sub dimension "contract management" in the adjusted maturity model. The questions of each category as proposed by NEVI are used to create the different maturity stages.[166] For the new contract management part of the maturity model see Figure 2 Questions for new sub dimension contract management. To summarise, contract management is an important factor within a purchasing department and therefore necessary to be blend more in the maturity model of Schiele (2007).

	Management Function	Questions for Analysis	% ob-serv-ed	points (1-20)	Evidence for assess-ment	Stage 1 (1-5 points, <=25%)	Stage 2 (6-10 points<=50%)	Stage 3 (11-15<=75%)	Stage 4 (16-20<=100%)
PO8	Contract Management								
	Governance	Is the role of contract manager clearly described in terms of responsibilities/tasks? Is there enough support and mandate within the organisation to perform their tasks?				Contract management is an additional task of a purchaser.	Contract management is dedicated to specific contract managers.	Tasks and responsibilities for contract managers are clearly defined and known.	Contract managers have much influence in important contract related decisions.
	Service delivery	Is the performance of a contract measured?				Contracts are managed in a more administrative way.	Contracts are actively managed. KPI's are identified and known.	Contracts are actively managed. KPI's are identified and assessed.	Contracts are actively managed. KPI's are identified and assessed. Contract managers play a role in the development of a supplier.
	Relation management	Is there an intensive effort to manage relations with suppliers?				Suppliers are awarded for performance. Communication between buyer and supplier is regularly .	Same + intern all stakeholders have access to contracts	Same + structured and formalised communication.	Same + clear escalation procedures.
	Contract administration	Is there an actively managed contract administration?				Contracts are centrally stored and easily accessible.	Systematical process of contract storage and managing the basics (e.g. termination procedures).	Software is used to manage and store contracts.	Same + insights in changes from the business that affect contracts and procedures for adapting contracts.

Figure 2 Questions for new sub dimension contract management

[161] See NIC as referred by Bos (2014), p.15-16.
[162] See NIC as referred by Bos (2014), p.15-16.
[163] See NIC as referred by Bos (2014), p.15-16,
[164] See NEVI (n.d.), p.12-14.
[165] See NEVI (n.d.), p.12-14.
[166] See NEVI (n.d.), p.12-14.

5. The proposed research models and corresponding hypotheses

5.1 Hypotheses and quantitative research model

This chapter outlines the three different parts of the research and corresponding hypotheses. The first part is quantitative in which the factors are identified which have an impact on maturity perception of suppliers. Subsequently, the current maturity of a service company is measured in the second part of the research. This second part is qualitative and contains the interviews to fill out the maturity model. In the final part of the research, the results of the factors which have an impact on maturity perception are compared with the results of the maturity model. In the end, this comparison must show if suppliers perceive factors which have an impact on maturity differently than the maturity according to the purchasing department. To identify these possible differences, a qualitative approach is applied. This qualitative approach is applied because of different sizes in the sample groups and different methods to analyse the results of the first two parts. The methodology of these three parts is outlined in the next chapter; the current chapter is proposing the hypotheses. This paragraph drafts hypotheses for the quantitative part where in paragraph 5.2 the qualitative results are hypothesised.

The quantitative research must come up with factors that have an impact on maturity perception of suppliers. As mentioned before, being perceived as mature by suppliers can gain competitive advantages like obtaining preferred customer status. [167] Maturity perception is not clearly defined in scientific literature. In the research of Hüttinger et al. (2014) and subsequently in the research of Vos et al. (2016), the construct operative excellence has been introduced which shows similarities to maturity perception. Hüttinger et al. (2014) described operative excellence as "the supplier's perception that the buying firm's operations is handled in a sorrow and efficient way, which facilitates the way of doing business for the supplier".[168] In maturity model literature, maturity of purchasing is defined as the professionalism and sophistication of the purchasing function.[169] Because maturity and operative excellence show similarities, the construct operative excellence of Hüttinger et al. (2014) is used as basis for the construct maturity perception in this research. The construct is elaborated with topics regarding communication and information facilities of the organisation like the research to mature supplier relationships of Bemelmans et al. (2015) also contained.[170] Therefore the construct maturity perception can be defined in this research as 'the supplier's perception of the sophistication and professionalism of the purchasing function of

[167] See Bemelmans/Voordijk/Vos/Dewulf (2015), p.194.
[168] Hüttinger/Schiele/Schroër (2014), p.703.
[169] See Rozemeijer/vanWeele/Weggeman (2003), p.5; Schiele (2007), p.274 as well as Úbeda/Alsua/ Carrasco (2015), p.178.
[170] See Bemelmans/Voordijk/Vos/Dewulf, (2015), p.186.

an organisation, which facilitates the way of doing business and maintaining relationships with suppliers'.

As mentioned before, scarce literature is available about which factors influence the maturity perception of suppliers. Therefore purchasing literature about supplier satisfaction, collaborative relationships and customer attractiveness is consulted to deduct some factors which can be of importance for the perceiving of maturity. In total six factors can be of importance in how suppliers perceive maturity and these factors are further elaborated in this paragraph. The factors which are used as starting point for identifying important factors for maturity perception are from the research of Hüttinger et al. (2014) and Vos et al. (2016).[171] These factors can be split up into two groups; relational factors and economic factors. This distinction is also made in previous research where satisfaction and collaborative performance are measured.[172] Satisfaction and collaborative performance reflect the opinion of the supplier about collaboration/behaviour of the buyer. Therefore, this division is also applied in this research in which maturity perception also reflects an opinion about the buyer. Hence, the first category of factors which is considered to be important for maturity perception contains the relational factors (1) contact accessibility (2) relational behaviour, (3) innovation potential, (4) reliability, (5) support and (6) involvement. These relational factors reflect the behaviour and processes of an organisation which can be linked to maturity of the purchasing function. The second category contains the economic factors like growth opportunity and profitability. The economic factors are not taken into account in this research because these factors have to do with the growth potential, profit and margin a supplier can generate in the relation with its buyer. These factors have no logic connection with maturity because maturity is about the professionalism and sophistication of the purchasing functions. Therefore, maturity reflects more processes than potential economic benefits for suppliers. However, the professionalism and sophistication of the purchasing function can contribute to savings for the own organisation.[173] The second category with economic factors has no clear connection to maturity and is therefore excluded. Only the category with relational factors is investigated in this research.

At first, (1) Contact accessibility is discussed to have a possible positive impact on maturity perception. Contact accessibility is the frequency and easiness of contact between a buyer and supplier.[174] It has already been found to have an impact on operative excellence.[175] Since maturity perception is deducted from operative excellence, this research assumes that contact accessibility has an impact on the maturity perception of suppliers. Bemelmans et al. (2015)

[171] See Hüttinger/Schiele/Schroër (2014), p.703 as well as Vos/Schiele/Hüttinger (2016), p.4620.
[172] See Nyaga/Whipple/Lynch (2010), p.103 as well as Vos/Schiele/Hüttinger (2016), p.4614.
[173] See Schiele (2007), p.281.
[174] See Hüttinger/Schiele/Schroër (2014), p.703.
[175] See Vos/Schiele/Hüttinger (2016), p.4620.

support this hypothesis because they take into account a communication factor in their research of managing relationships mature.[176] So, the hypothesis can be proposed that contact accessibility has a positive impact on maturity perception (H1a).

Loyalty, fairness and shared values are of value in maintaining the relation with suppliers.[177] The factor (2) Relational behaviour is therefore also important to take into account in this research. Relational behaviour can be described best as the fair, solidarity and well-mannered behaviour of parties in a relationship.[178] In this research the factor relational behaviour is seen from the perspective of the supplier about how well and fair the buyer behaves in the relationship. Úbeda et al. (2015), state that purchasing maturity is among others a measure how suppliers are managed.[179] From a mature buyer can be expected that he behaves well, fair and solidarity. Therefore relational behaviour can be proposed to have a positive impact on the maturity perception of suppliers (H1b).

The third factor for discussion is (3) Innovation potential. According to Hüttinger et al., "Innovation potential is understood as the supplier's opportunity to generate innovations in the exchange relationship due to the buying firm's innovative capabilities and its contribution in joint innovation processes".[180] The level of innovation could be of great importance in reflecting the professionalism as Schiele (2007) suggest for further research.[181] Also Bemelmans et al. (2015) took innovation into account in their maturity assessment.[182] As soon as the buyer is able to innovate and collaborate in these innovations, the maturity score in a maturity model rises. Therefore it could be that the maturity perception of a supplier increases as soon as the buyer innovates a lot or has many new product development processes in collaboration with the supplier. So, innovation potential has a positive impact on maturity perception (H1c).

(4) Reliability is another relational factor which can have an impact on maturity perception. "Reliability is the actor's perception that the other actor's promises are fulfilled or that commitments are reliable and that the dyadic associate acts in a consistent or predictable manner".[183] In this research the actor of this research is considered to be the buyer. As Hald, Cordón and Vollmann (2009) state that reliability implies consistency in different functions and levels within an organisation.[184] More professional procedures and standards are available and applied as soon as purchasing is mature. Consequently a high maturity should go along with

[176] See Bemelmans/Voordijk/Vos/Dewulf, (2015), p.186.
[177] See Hald/Cordón/Vollmann (2009), p. 964.
[178] See Hüttinger/Schiele/Schröer (2014), p.703.
[179] See Úbeda/Alsua/Carrasco (2015), p.178.
[180] Hüttinger/Schiele/Schroër (2014), p.703.
[181] See Schiele (2007), p.283.
[182] See Bemelmans/Voordijk/Vos/Dewulf, (2015), p.186.
[183] Hald/Cordón/Vollmann (2009), p.965.
[184] See Hald/Cordón/Vollmann (2009), p.965.

consistency and hence also reliability. Thus, another factor that possibly has a positive impact on maturity perception is reliability (H1d).

The research of Hüttinger et al. (2014) states the importance of (5) Support of the buyer to the supplier because it has influence on the supplier satisfaction.[185] They use the article of Krause and Ellram (1997) in defining support.[186] Support can be defined as "any effort of a buying firm with a supplier to increase its performance and/or capabilities and meet the buying firm its short and/or long-term supply needs".[187] However, this definition is meant for development. Support and development have many similarities. Accordingly, Hald et al. (2009) state that support can be defined as "the actor's perception that the other actor company will help and assist it out of its own free will, without any apparent or immediate benefit to itself".[188] Difference in these definitions is the presence of a direct effect/benefit for the buyer. Main essence of both definitions is that a buyer puts effort in increasing the performance and capabilities of its supplier leaving aside the immediate benefit for the buyer. Support is expected to have a high impact on maturity perception, because supplier development is part of the maturity model. Extensive supplier development contributes to a higher maturity level.[189] As a result, support possibly has a positive impact on maturity perception (H1e).

The last relational factor that is hypothesised to have a positive impact on maturity perception is (6) involvement. In this involvement the supplier is participating in the new product development processes (hereinafter called as NPD processes) of the buyer. Involvement can be described best as the participation degree of a supplier in the NPD processes and NPD team of a buyer to develop new innovative ideas.[190] Walter (2003) implies involvement "depends strongly on motives, strategies, and capabilities of the customer".[191] Besides, the degree of (early) NPD processes with suppliers is of main importance for maturity.[192] So, involvement can have a strong impact on maturity perception (H1f). To conclude, the first hypothesis can be proposed on which factors have a possible impact on maturity perception:

> **Hypothesis 1:** Contact accessibility (H1a), relational behaviour (H1b), innovation potential (H1c), reliability (H1d), support (H1e) and involvement (H1f) have a positive impact on maturity perception.

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[185] See Hüttinger/Schiele/Schroër (2014), p.704.
[186] See Hüttinger/Schiele/Schroër (2014), p.703.
[187] Krause/Ellram (1997), p.39.
[188] Hald/Cordón/Vollmann (2009), p.964.
[189] See Schiele (2007), p.282.
[190] See Handfield/Ragatz/Petersen/Monczka (1999), p.80; Walter (2003), p.723; Ellis/Henke/Kull (2012), p.1261 as well as Hüttinger/Schiele/Schroër (2014), p.703.
[191] Walter (2003), p.729.
[192] See Schiele (2007), p.277 as well as Bemelmans/Voordijk/Vos/Dewulf (2015), p.182.

All factors which are now reasoned to have a positive impact on maturity perception derived from literature of important antecedents for supplier satisfaction. Therefore maturity perception and supplier satisfaction can also have a relation. As already mentioned before, supplier satisfaction can be described as the positive opinion of the supplier about meeting or exceeding the expectations in a positive evaluation of the relationship between buyer and supplier. The factor maturity perception is deducted from the operative excellence factor from the research of Hüttinger et al. (2014) and Vos et al. (2016). The study of Vos et al. (2016), proved a positive impact of operative excellence on supplier satisfaction.[193] Therefore it is conceivable that maturity perception has an impact on supplier satisfaction. As soon as this positive relation exists, it would be worthier to work on the factors impacting maturity perception because high supplier satisfaction also has benefits. Supplier satisfaction, similar like being perceived as mature, can contribute in gaining preferred customer status and subsequently preferential treatment sooner. [194] This possible relation is tested in the following hypothesis:

Hypothesis 2: Maturity perception has a positive impact on supplier satisfaction.

In Figure 3 Proposed research model quantitative part, the proposed research model is shown for the quantitative part of this research. The hypotheses discussed above are visualised in this model as well. The next paragraph outlines the proposed research model for the qualitative part of the research.

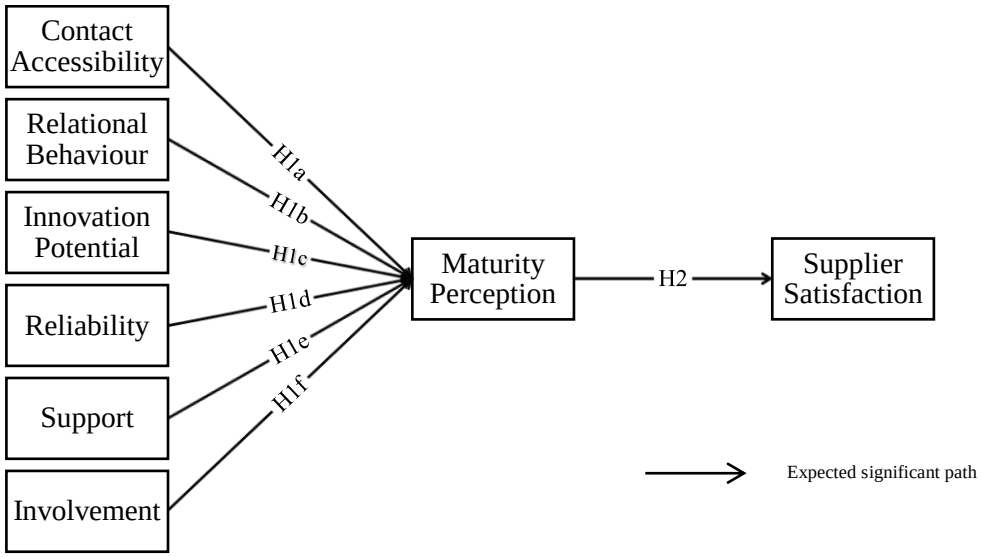

Figure 3 Proposed research model quantitative part

[193] See Vos/Schiele/Hüttinger (2016), p.4620.
[194] See Schiele (2012), p.44; Bemelmans/Voordijk/Vos/Dewulf (2015), p.194 as well as Vos/Schiele/ Hüttinger (2016), p.4613.

5.2 Qualitative prediction and research model

The second part and third part of this research contain a qualitative character. For the second part of this research interviews are conducted to identify the maturity level of the case company. Subsequently, the results of the maturity model and the factors that are important in perceiving maturity by suppliers are combined in the third part of this research. The ultimate purpose of this qualitative part is to measure an eventual difference in actual maturity and maturity perception. This paragraph describes what is proposed to be the outcome.

In the second part of the research, the maturity model is adjusted to make it suitable for service organisations. The search for adjustments is done in chapter 3. As stated in chapter 3, maturity is the level of professionalism and sophistication of purchasing. [195] To summarise; because of three reasons the current maturity models need to be adapted for a service organisation. At first, a difference exists between purchasing in product organisations and purchasing in service organisations. In service organisations the purchasing volume is mainly NPR where in a product organisation this is for about 30% NPR and the remaining 70% is dedicated to primary processes.[196] The second reason is the suggestions for further research into maturity models for service organisations. Maturity models for service organisation may require a different set of criteria.[197] Additionally, literature also questions if the maturity level needs to be same for every organisation.[198] The last reason is the importance of contract management in service organisations. Service organisations outsource many services.[199] In outsourcing, contract management is crucial to avoid any misunderstandings.[200] So, in the end a maturity model which is suitable for service organisations is composed and tested.

The third and last part of the research is the identification of any differences in actual maturity and maturity perception from suppliers. The identification of these gaps has an exploratory character as it is difficult to measure two perspectives. The purchasing department has more knowledge about their own functioning where the supplier only has occasional contact. Suppliers are not part of a purchasing organisation and can therefore have no real picture of the business within purchasing. Therefore, actors important in perceiving maturity must be compared with the actual maturity level. Nyaga, Whipple and Lynch (2010) conducted research to the differences in perception in buyer-supplier relationships and concluded these perceptions differ.[201] In addition, the study of Bemelmans et al. (2015) showed that suppliers perceive a different level of maturity

[195] See Rozemeijer/vanWeele/Weggeman (2003), p.5; Schiele (2007), p.274 as well as Úbeda/Alsua/Carrasco (2015), p.178.
[196] See deBoer/Holmen/Pop-Sitar (2003), p.911.
[197] See Schiele (2007), p.283.
[198] See Schiele (2007), p.283 as well as Úbeda/Alsua/Carrasco (2015), p.179.
[199] See Sheth/Sharma (1997), p.99.
[200] See Chou/Chou (2009), p.1037.
[201] See Nyaga/Whipple/Lynch (2010), p.110.

instead of the actual maturity level.[202] Buyers not necessarily show their actual maturity in maintaining the relationship with the supplier.[203] Contradictory, the research of Bemelmans et al. (2015) showed that a buyer's actions and behaviour, the perceived maturity by suppliers, decide whether or not a supplier awards preferred customer status to that buyer.[204] Therefore buyers must "focus on being perceived as mature in supplier relationship management, as much as on actually being mature".[205] This shows that the first quantitative part is useful, because factors that influence perception must be identified. Additionally, both Nyaga et al. (2010) and Bemelmans et al. (2015) state a difference in perception between buyer and supplier.[206]

So, differences in maturity and maturity perception are identified to see if the supplier perceives the actual maturity level or not. As soon as this is not the case, it might not be necessary to improve the different aspects in the purchasing department as suppliers do not perceive it that bad. The factors which influence maturity perception, found in the first quantitative part of the research, might be necessary for buyers to focus on. This results in the final proposition of this research:

> *"Maturity perception of suppliers differs from the actual maturity of the purchasing function."*

In Figure 4 Proposed research model qualitative part, this proposition is visualised. In this figure is assumed that the supplier perceives the maturity of the buyer different than the actual maturity level of the buyer. The next chapter outlines the methodology which is used to confirm these hypotheses or not.

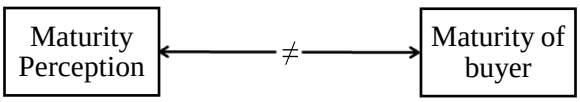

Figure 4 Proposed research model qualitative part

[202] See Bemelmans/Voordijk/Vos/Dewulf (2015), p.193.
[203] See Bemelmans/Voordijk/Vos/Dewulf (2015), p.193.
[204] See Bemelmans/Voordijk/Vos/Dewulf (2015), p.193.
[205] Bemelmans/Voordijk/Vos/Dewulf (2015), p.193.
[206] See Nyaga/Whipple/Lynch (2010), p.110 as well as Bemelmans/Voordijk/Vos/Dewulf (2015), p.193.

6. The methodology

6.1 Financial service organisation as case company

This research contains three parts and is of explorative character. In the first part, the hypotheses are tested by use of a quantitative method. The second part and third part are of qualitative character, respectively the completing of the maturity model and the analysis for the identification of gaps. The explorative character of the research is chosen to get a first impression of factors important for maturity perception and the possible differences in views. Subsequently recommendations and directions for further research can be proposed. This sub paragraph introduces the case company at first. After that, paragraph 6.2 discusses the first quantitative part. Subsequently, paragraph 6.3 and 6.4 discuss the qualitative part of the research.

The case company that was deliberately chosen for the proposed research is a financial services organisation. In a financial services organisation the core is to provide services. As already concluded in chapter 2, service organisations differ from product organisations. Purchasing in a service organisation comprises all purchasing activities regarding (mostly) NPR purchases where in a product organisation about 30% of the purchasing activities comprise NPR purchases.[207] The remaining part of the purchasing activities in a product organisation comprises purchasing activities regarding the primary operations.[208]

The case company that is chosen for this research is a financial service organisation providing financial services. Three years ago, purchasing is centralised within the case company. This central purchasing department consists of a Corporate Procurement Officer (CPO), two buyers, senior manager contract management and five contract managers. This purchasing department takes care of all contracts above €10.000 or with a high risk and maintain a close relationship with their suppliers. The other contracts and contact with suppliers is managed by decentralised contract managers who do this task as a (small) part of their job.

6.2 Part one: The survey methodology to identify how suppliers perceive maturity

A survey is used in the first quantitative part of this research. This tool is chosen because many respondents are needed to find significant factors impacting maturity perception. Previous research with the same kind of topics regarding to supplier satisfaction, preferred customer status and

[207] See deBoer/Holmen/Pop-Sitar (2003), p.911.
[208] See deBoer/Holmen/Pop-Sitar (2003), p.911.

collaborative relationships, used also a survey to identify links between different factors.[209] Therefore, a survey is used to identify factors which impact maturity perception of suppliers. The composing of measurement instrument, sampling, data collection, data analysis and quality assessment of data structure and model reliability and validity for the survey is described in this paragraph.

The measurement instrument

As already mentioned, a survey is used to identify factors impacting maturity perception. The measures which are used in this survey are almost similar to those of the questionnaire used for the research of Vos et al. (2016).[210] The hypotheses in chapter 5.1 showed that six factors might have an impact on maturity perception and indirectly on supplier satisfaction. These six factors are; (1) contact accessibility, (2) relational behaviour, (3) innovation potential (4) reliability (5) support and (6) involvement. The similar questions of Vos et al. (2016) are used, because these six factors are also covered in that questionnaire. These questions have been critically reviewed and adapted in order to make it applicable for this research. Questions also contain the word service instead of only the word product. Besides, only questions remain for NPR purchases, so for example raw material questions are eliminated. Also the questions for the factor supplier satisfaction are used from the questionnaire of Vos et al. (2016). Existing questions are chosen because they were already tested in previous research. They were proved to be reliable and significant in that model.[211]

For the last factor maturity perception, new questions need to be composed. For this new construct maturity perception, the existing construct operative excellence of Hüttinger et al. (2014) and Vos et al. (2016) is used as baseline because this already includes some aspects of maturity, e.g. planning. Questions are added regarding communication and information facilities like the research of Bemelmans et al. (2015) also contained.[212] Subsequently, the maturity model of Schiele and the NICV-model are kept in mind by creating additional questions to this operative excellence construct to change it in maturity perception.[213] This resulted in a new construct of 12 items, which are afterwards analysed to see if they all hold. All questions are proposed to suppliers in a 5-point Likert scale. The lowest point is “No, totally disagree” and the highest point is “Yes, totally agree”.

[209] See Carr/Pearson (1999), p.503; Paulraj/Chen/Flynn (2006), p.111; Ulaga/Eggert (2006), p.128; Nyaga/ Whipple/Lynch (2010), p.106; Ellis/Henke/Kull (2012), p.1262; Hüttinger/Schiele/Schroër (2014), p.706; Pulles/Veldman/Schiele (2014), p.412; Pulles/Schiele/Veldman/Hüttinger (2016), p.133 as well as Vos/ Schiele/Hüttinger (2016) p.4616.
[210] See Vos/Schiele/Hüttinger (2016).
[211] See Vos/Schiele/Hüttinger (2016), p.4617/4620.
[212] See Bemelmans/Voordijk/Vos/Dewulf, (2015), p.186.
[213] See Schiele (2007), p.283-291 as well as NIC as referred by Bos (2014), p.15-16.

All questions for the constructs that are used in the final model (see chapter 7.2) are presented in Appendix A Questions used in final quantitative model.

Sampling

As mentioned in the introduction of the case company, a central purchasing function and a decentralised purchasing function exists. In this research, the scope is limited to the central purchasing function because this specific department and its employees are fulltime occupied with purchasing related tasks and topics. The decentralised purchasing function, which is executed by decentralised contract managers, is dedicated to the business which is not fulltime busy with purchasing. These decentralised contract managers are widely spread across the organisation and take care of contracts below €10.000. The threshold of €10.000 makes those relations with suppliers below this threshold probably not that intensive and these suppliers are therefore not relevant for this research. The most important contracts and the corresponding suppliers are managed by the centralised purchasing department. Therefore only the suppliers of the centralised purchasing department belong to the research population.

Moreover, the other part of the research is to investigate the maturity of the centralised purchasing department by conducting interviews. The decentralised contract managers are not included in this. In order to make a correct link in the end of the research, the scope is the centralised purchasing department and the suppliers that have contact with the centralised purchasing department. So, the decentralised contract managers and the small suppliers (below €10.000) are not included in this research.

From the supplier database of the case company, an export is made with all suppliers, 552 in total. Based on two selection steps, suppliers are selected and thereby the population of this research. At first, only those suppliers are selected who have a current relationship with the case company. Taking into account this criteria, already 215 suppliers are excluded because they have no (active managed) contract at the moment. The remaining supplier group of 337 active suppliers is limited subsequently by use of more specific criteria. Suppliers who are known by the purchasing department are selected, because these selected suppliers can say something about the functioning of the centralised purchasing department. This is important because the maturity model used in this research only encompasses respondents of the centralised purchasing department. Otherwise the two outcomes from the survey and the maturity model cannot be correctly linked to each other. Next, only those suppliers are selected which have a contract value of above €10.000 or have more impact on the organisation than usual. A few suppliers are not taken into account on a strategic point of view. At the moment of sending the survey, this action could disturb the relationship. In the end, the applied selection method resulted in 118 suppliers. These 118 suppliers are suppliers who have a current relationship/contract with the case company, are known by the centralised purchasing department, have a contract value above €10.000 and/or have a high impact on the case

company. This group of suppliers is approached for the survey and is also the population of this research.

Data collection

The survey is composed in an online tool "Limesurvey" which is a facility that the University of Twente hosts. This online tool makes it possible to collect all responses in a safe and anonymous environment where the answers cannot be traced back to individual suppliers. The only evidence that could be traced back is if a supplier completed the questionnaire. The answers he/she returned are saved in a separate file where no link exists between the supplier and its answers. The reason for conducting the survey in this way is that suppliers do not receive unnecessary reminder emails.

The suppliers are invited by email to participate in the survey. The email was directly sent to the contact person of the supplier and the contact person of the case company was mentioned in the CC to show suppliers from whom the researcher had received their contact details. The suppliers have had two weeks to complete the survey. This first approach resulted in 32 completed questionnaires. This is not enough and therefore the suppliers were approached again by an email notification that the survey still could be filled in. The closing date of the survey was postponed with three and a half week. Main reason for such a long period was because the Christmas Holidays were part of this second period. In the last week before the new closing date, 59 suppliers filled out the survey but this is still not enough. Therefore in the final week, all suppliers who did not filled out the survey were called and if not reachable, mailed, to notice for the final time that they could participate in the supplier satisfaction survey. This final action resulted in 20 extra completed questionnaires which makes the total to 79 completed questionnaires. An overview of responses is shown in Table 4 Respondent rate survey. A response rate of 66.9% was reached which is very high. Barouch and Holtom (2008) analysed 1607 studies across different industries in a time period of 5 years. They found an average response rate for financial services industry of 57%.[214] So, the response rate of this study exceeds that average.

Table 4 Respondent rate survey

Approach	*Number of completed respondents*	*Response rate*	*Cumulative response rate*
Invitation by email	32	27.11%	27.11%
Reminder by email	27	22.88%	50.00%
Final reminder by phone (by email if not reachable)	20	16.95%	66.94%
Total respondents	79	66.94%	66.94%
Total suppliers approached	118		

[214] See Barouch/Holtom (2008), p.1153.

In Table 5 Characteristics of respondents, the general information of the respondents is shown. Remarkable is that more than half of the suppliers are located in the Randstad. Also noticeable is that suppliers classify themselves only as being in the tertiary sector and quaternary sector, which shows that all suppliers are operating in service oriented industries.

Table 5 Characteristics of respondents

1. Region of supplier

Randstad (Noord-Holland, Utrecht, Flevoland, Zuid-Holland)	63,29%
South of the Netherlands (Noord-Brabant, Limburg, Zeeland)	21,52%
North of the Netherlands (Groningen, Flevoland, Drenthe)	2,53%
East of the Netherlands (Gelderland, Overijssel)	2,53%
Other country	10,13%

2. Number of employees

< 10	10,13%
11 - 50	24,05%
51 -250	30,38%
251 - 1000	8,86%
> 1000	24,05%
Not specified	2,53%

3. Length of relationship

< 5 years	35,44%
5 - 10 years	46,84%
11 - 20 years	10,13%
> 20 years	7,59%

4. Sector of respondent

Primary sector (Basic industry, e.g. mining & farming)	0,00%
Secondary sector (Industrial sector, e.g. industry, energy-/water utilities, construction)	0,00%
Tertiary sector (Service sector, e.g. logistics, retail, cleaning, repair, insurance)	21,52%
Quaternary sector (Information sector, e.g. economic/tax consultant, IT, engineers, lawyers)	78,48%

Data analysis

An often used method to assess the buyer-supplier relationship is to conduct a survey and subsequently analyse results by use of quantitative analysis techniques like (Multivariate) Analysis of Variance ((M)ANOVA) [215] or Structural Equation Modelling (SEM)[216]. Two different types of SEM exist; Partial Least Square (PLS) and Co-Variance Based (CB). PLS is often applied for prediction and theory testing where CB is often used for confirming of theory.[217] PLS has four

[215] See Carr/Pearson (1999), p.506 as well as Paulraj/Chen/Flynn (2006), p.114.
[216] See Ulaga/Eggert (2006), p.129; Nyaga/Whipple/Lynch (2010), p.107; Ellis/Henke/Kull (2012), p.1264; Hüttinger/Schiele/Schroër (2014), p.706; Pulles/Veldman/Schiele (2014), p.413; Pulles/Schiele/Veldman/ Hüttinger (2016), p.136 as well asVos/Schiele/Hüttinger (2016), p.4616.
[217] See Reinartz/Haenlein/Henseler (2009), p.333.

major advantages as several studies suggest.[218] At first, Henseler and Sarstedt (2013) refer to Fornell and Bookstein (1982) and point out that "PLS estimation involves no assumptions about the population or scale of measurement, there are no distributional requirements".[219] Secondly, when having a small sample size, PLS modelling also offers opportunities to estimate relationships between variables.[220] Tenenhaus, Esposito Vinzi, Chatelin and Lauro (2005) state this as well; "there can be more variables than observations and there may be a small amount of data that are missing completely at random".[221] Thirdly, it has becoming more attractive to work with PLS software as their graphical appeal is improving.[222] Finally, PLS modelling is more suitable than CB modelling for more complex models as soon as the number of latent variables is high comparing to the number of observations and the number of items per latent variable is low.[223] Several studies with the same kind of purpose as this research use Partial Least Square Structural Equation Modelling (PLS-SEM).[224] Besides this research has a small sample group and is also oriented towards prediction of theory. Because of that, PLS is a proper analysis method for this research.

This research uses the SmartPLS 3.0 program from Ringle, Wende and Becker for the first step of the analysis.[225] Similar studies like this study use this SmartPLS program as well. [226] Next to PLS software, many studies use an initial, exploratory or confirmatory factor analysis to either explore the results first before analysis in PLS software or to check results from PLS software. [227] Therefore this research is conducting an analysis in PLS software in the first place and subsequently control these results by use of a factor analysis in SPSS. Also the descriptives of the research are calculated by SPSS.[228]

As a side step of this research, also a replication of the model of Vos et al. (2016) is executed to see if that model holds for this case company. In Appendix B Replication of the model of Vos et al. (2016), this replication, quality criteria and industry comparison are visible.

Additionally, two extra factors are tested on maturity perception. As mentioned in the hypotheses chapter, only relational factors are tested to see if they have any effect on maturity perception and indirectly on supplier satisfaction. Economic factors are not likely to have an impact

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[218] See Henseler/Ringle/Sinkovics (2009), p.288-289 as well as Henseler/Sarstedt (2013), p.566.
[219] Fornell/Bookstein (1982), p.443.
[220] See Chin/Newsted (1999), p.314.
[221] Tenenhaus/Esposito Vinzi/Chatelin/Lauro (2005), p.202.
[222] See Henseler/Sarstedt (2013), p.566.
[223] See Henseler/Sarstedt (2013), p.566
[224] See Hüttinger/Schiele/Schroër (2014), p.706; Pulles/Veldman/Schiele (2014), p.413; Pulles/Schiele/ Veldman/Hüttinger (2016), p.136 as well as Vos/Schiele/Hüttinger (2016), p.4616.
[225] See Ringle/Wende/Becker (2015).
[226] See Hüttinger/Schiele/Schroër (2014), p.706; Pulles/Veldman/Schiele (2014), p.413; Pulles/Schiele/ Veldman/Hüttinger (2016), p.136 as well as Vos/Schiele/Hüttinger (2016), p.4616.
[227] See Carr/Pearson (1999), p.506; Paulraj/Chen/Flynn (2006), p.112; Ulaga/Eggert (2006), p.129; Nyaga/Whipple/Lynch (2010), p.106; Ellis/Henke/Kull (2012), p.1264; Hüttinger/Schiele/Schroër (2014), p.706 as well as Pulles/Veldman/Schiele (2014), p.413;
[228] IBM Corp. (2015)

on maturity perception as they seem to have only benefit to buyers and not suppliers. Maturity perception is the perception of suppliers about the sophistication and professionalism of the behaviour and processes of the purchasing function of the buyer. Therefore economic factors seem not to have a direct link with maturity perception. According to Hald et al. (2009), suppliers prefer buyers who grow because this leads to growth in sales of the supplier and strengthen the position of the buyer and consequently the supplier.[229] Growth opportunity can be defined as the possibility for a supplier to grow together with the buyer and create business opportunities for himself.[230] Also Profitability is important for suppliers because they need it to survive.[231] Profitability can be defined as the degree of profit and margin a buyer contributes to the supplier.[232] Savings are related to maturity as literature states.[233] These savings are for the buyer organisation and not directly mentioned for the supplier. One can assume that as soon as a buyer is mature, he is able to grow more because of more sophisticated processes. Therefore the supplier also has more chance to grow. Another reason can be that more mature purchasing functions are better in negotiations because a part of a maturity model is how well negotiation preparation and training is arranged. Subsequently suppliers can obtain lower margins and profits and therefore profitability can be negatively related to maturity perception. However, a clear link with maturity cannot be found in literature with both growth opportunity as profitability so it is likely they have no relation with maturity perception. Growth opportunity and profitability both have an impact on supplier satisfaction as previous research showed.[234] Baseline for identification of factors was to look at literature about supplier satisfaction, collaborative relationships and customer attractiveness since literature about factors of perceiving maturity is scarce. Therefore these two factors are tested as control variables to be sure that they have an impact on maturity perception. In Appendix C Testing economic factors as control variables, the results of this check are visible. Both growth opportunity and profitability have no relation with maturity perception as already expected. The remaining part of the research does not take into account these economic factors and tests the proposed model as in Figure 3 Proposed research model quantitative part.

Quality assessment of data structure and model reliability and validity

The supplier satisfaction survey resulted in 79 respondents. First step of the analysis is to identify and assess outliers and if necessary delete them. An outlier is a set of answers of a respondent

[229] See Hald/Cordón/Vollmann (2009), p.964.
[230] See Walter/Ritter/Gemünden (2001), p.372 as well as Hüttinger/Schiele/Schroër (2014), p.703.
[231] See Walter/Ritter/Gemünden (2001), p.367.
[232] See Walter/Ritter/Gemünden (2001), p.377 as well as Vos/Schiele/Hüttinger (2016), p.4615.
[233] See Schiele (2007), p.281 as well as Úbeda/Alsua/Carrasco (2015), p.183.
[234] See Vos/Schiele/Hüttinger (2016), p.4620.

"with a unique combination of characteristics identifiable as distinctly different from the other observations".[235] However deletion of outliers is questioned:

> "When beneficial, outliers – although different from the majority of the sample- may be indicative of characteristics of the population that would not be discovered in the normal course of analysis. In contrast, problematic outliers are not representative of the population, are counter to the objectives of the analysis, and can seriously distort statistical tests."[236]

A way to identify outliers is to apply the Outlier labelling rule as described by Hoaglin, Iglewicz and Tukey (1986).[237] Both a k-value of 1.5 and 2.2 can be used in this rule.[238] As this is a small sample ($n < 100$), the value of 2.2 is used. On the constructs that are used in the Smart PLS 3.0 analysis, this outlier labelling rule is applied. One construct seems to have many outliers (> 10). This because the 25% and 75% quartile are very close to each other and the range is not very big. As soon as these outliers are deleted, hardly any respondents remain; therefore the choice is made to keep all respondents.

Also, a way to delete outliers or strange data is to delete a respondent as soon as it has more than 15% missing answers.[239] All Likert-scale and multiple-question questions, which are used in this analysis, are obligatory and therefore all answers of respondents are complete. One general information question was not obligatory because it was an open answer question; 'What is the number of employees working at your firm?'. As can be seen in Table 5 Characteristics of respondents, 2.53% of the respondents left this field empty. So, only at one question a missing answer rate of 2,53% exists. Therefore, the 15% threshold of missing answers is not reached. Based on missing values, no individual respondents need to be deleted. In the end, no data is deleted because it is a small sample group, every sample is valuable and there is no missing data in the factors. The supplier is also asked in the end of the questionnaire, how familiar he is with the buyer to answer all questions proper enough. This resulted in an average of 3.81 on a 5 point scale, where 5 is strong familiar and 1 is not familiar at all. So, suppliers indicated they are very familiar with the buyer to answer all the questions.

All factors are tested in Smart PLS 3.0 in the way they are linked in Figure 3 Proposed research model quantitative part. At first, all questions are connected to their corresponding factor to subsequently perform a PLS Algorithm. One by one the questions which have a loading of below 0.7 are removed. The lowest loading is removed first, subsequently the model is tested again

[235] Hair/Black/Babin/Anderson (2014), p.62.
[236] Hair/Black/Babin/Anderson (2014), p.63.
[237] See Hoaglin/Iglewicz/Tukey (1986), p. 991.
[238] See Hoaglin/Iglewicz (1987), p. 1148.
[239] See Hair/Black/Babin/Anderson (2014), p.46.

and so items with a loading below 0.7 are removed one by one. This threshold of 0.7 loading is applied by several authors. [240] As these loadings are correlations, this shows that more than 50% of the variance in the indicator can be explained by the latent variable.[241] After eliminating all questions with a loading below 0.7 one by one, all item-to-construct loadings were significant (<0.001) and were well above the cut-off value of 0.7 indicating a substantive contribution. Now, the assessment of quality criteria can be conducted. In Table 6 Quality criteria of first model and Table 7 HTMT-ratios and correlations first model, the quality results are shown. Cross loadings from this first model are visible in the Appendix D Cross loadings first model.

At first the convergent validity is tested by assessing the Cronbach's Alpha, composite reliability (hereinafter called as CR) and Average Variance Extracted (hereinafter called as AVE). Convergent validity "assesses the degree to which two measures of the same concept are correlated".[242] The Cronbach's Alpha is a measure of reliability and should be above 0.7; however 0.6 is also acceptable in exploratory research.[243] All factors have reliability above 0.7. Besides Cronbach's Alpha, CR is also a way to control for internal consistency and should not be lower than 0.6 as well.[244] For all factors this criterion is met as they have even a CR above 0.864. AVE shows the "convergence among a set of items representing a latent construct. It is the average percentage of variation explained (variance extracted) among the items of a construct".[245] The AVE should exceed 0.5 to be acceptable.[246] Also, all AVE's are high enough to meet the criteria.

Table 6 Quality criteria of first model

	AVE	*√AVE*	*CR*	*Cronbach's alpha*	R^2	*Inner VIF*
Contact accessibility	0,778	0,882	0,913	0,858		1,088
Relational behaviour	0,644	0,802	0,900	0,862		2,032
Innovation potential	0,680	0,825	0,864	0,766		1,612
Reliability	0,734	0,857	0,917	0,878		1,721
Support	0,820	0,906	0,901	0,783		1,341
Involvement	0,715	0,846	0,883	0,803		1,610
Maturity perception	0,625	0,791	0,930	0,914	0,652	1,000
Supplier satisfaction	0,690	0,831	0,898	0,851	0,462	

Note: AVE = Average variance extracted, CR = Composite reliability, √AVE = value for assessing the Fornell and Larcker (1981) statistic of discriminant validity (Criterion is √AVE > r,), VIF = Variance inflation factor

[240] See Hulland (1999), p.198; Henseler/Ringle/Sinkovics (2009), p.299; Hair/Ringle/Sarstedt (2013), p.6 as well as Hair/Black/Babin/Anderson (2014), p.605.
[241] See Hulland (1999), p.198 as well as Henseler/Ringle/Sinkovics (2009), p.299.
[242] Hair/Black/Babin/Anderson (2014), p.124.
[243] See Bagozzi/Yi (1988), p.82; Hair/Ringle/Sarstedt (2011), p.145; Hair/Black/Babin/Anderson (2014), p.125 as well as Henseler/Hubona/Ash Ray (2016), p.12.
[244] See Bagozzi/Yi (1988), p.82 as well as Henseler/Ringle/Sinkovics (2009), p.300.
[245] Hair/Black/Babin/Anderson (2014), p.601.
[246] See Bagozzi/Yi (1988), p.82; Hair/Ringle/Sarstedt (2011), p.145; Hair/Ringle/Sarstedt (2013), p.7 as well as Hair/Black/Babin/Anderson (2014), p.605.

Next, the support for the discriminant validity which contains three measures is discussed; Variance Inflation Factor (hereinafter called as VIF), Fornell and Larcker procedure and hetrotrait-monotrait (hereinafter called as HTMT) analysis. Discriminant validity "is the degree to which two conceptually similar concepts are distinct".[247] First the VIF, which shows "the effect that the other independent variables have on the standard error of a regression coefficient".[248] All VIF's are below the threshold of 5 which is recommended to maintain, so this criteria is met.[249] The Fornell and Larcker criterion states that the square root of the AVE should be higher than the inter-construct correlations.[250] Table 6 Quality criteria of first model shows the square root of AVE and Table 7 HTMT-ratios and correlations first model, shows the correlations. No correlation is higher than the square root AVE so this criterion is met. Final point of assessment is the HTMT analysis. The HTMT-ratios should be below 0.85 according to Henseler, Ringle and Sarstedt (2015).[251] In Table 7 HTMT-ratios and correlations first model, the HTMT-ratios are shown in the left corner and none of the ratios exceeds the 0.85 threshold.

Table 7 HTMT-ratios and correlations first model

	Contact accessibility	*Relational Behaviour*	*Innovation potential*	*Reliability*	*Support*	*Involvement*	*Maturity Perception*	*Supplier Satisfaction*
Contact accessibility		0,260	0,181	0,133	0,120	0,094	0,396	0,365
Relational Behaviour	0,288		0,342	0,641	0,333	0,286	0,614	0,725
Innovation potential	0,218	0,421		0,216	0,387	0,569	0,506	0,430
Reliability	0,184	0,727	0,253		0,145	0,147	0,632	0,587
Support	0,172	0,392	0,498	0,170		0,430	0,284	0,374
Involvement	0,177	0,339	0,720	0,173	0,539		0,443	0,408
Maturity Perception	0,422	0,676	0,594	0,695	0,330	0,507		0,680
Supplier Satisfaction	0,387	0,831	0,506	0,665	0,448	0,483	0,739	

6.3 Part two: The interview methodology to assess maturity

This paragraph outlines the qualitative part of the research in which a maturity model is conducted by use of interviews. At first the composition of the measurement instrument is explained. After that the sampling method, data collection and data analysis are described.

[247] Hair/Black/Babin/Anderson (2014), p.601.
[248] Hair/Black/Babin/Anderson (2014), p.157.
[249] See Hair/Ringle/Sarstedt (2011), p.147.
[250] See Fornell/Larcker (1981), p.48.
[251] See Henseler/Ringle/Sarstedt (2015), p.128.

The measurement instrument

As mentioned in paragraph 3.2, the most recent version of the maturity profile of Schiele, retrieved from the Professor himself, is used as a baseline in this research.[252] Schiele (2007) assessed the maturity model on 14 organisations within the metal parts production industry.[253] In total, five constructs with several questions and four different maturity stages result in 444 answer possibilities.[254] The five constructs which are included in the maturity model are (1) Procurement planning, (2) Organisational Structure of purchasing, (3) Process Organisation, (4) Human resources and leadership and (5) Purchasing controlling.[255]

In a service organisation were mainly NPR purchasing takes place, the focus of the most recent version of the maturity model of Schiele needs to be changed towards a more indirect procurement view. Therefore several adjustments are made. As soon as only products are mentioned in the question, service is added as well. Besides, five questions of the existing model are eliminated because they were only applicable on product-related purchasing (e.g. direct material). As this is not applicable for a service organisation, these questions are removed. To make it more suitable for a service organisation the NICV-model is taken into account for making additional contract management questions.[256] In total, six extra questions are composed. The added questions in the maturity model of Schiele (2007) are presented in Figure 5 Added questions in maturity profile of Schiele (2007). Two new questions relate to the organisational structure, as this is different compared to a product organisation. Mainly NPR purchasing occurs in service organisations where for 30% NPR purchasing takes place in product organisations. [257] The other four questions are related to contract management which is critical in purchasing services.[258] The composition of these four contract management questions are also discussed in paragraph 4.3 and are based on NEVI (n.d.).[259]

[252] See Schiele (2007) as well as Schumacher/Schiele/Contzen/Zachau (2008).
[253] See Schiele (2007), p.278.
[254] See Schiele (2007), p.278.
[255] See Schiele (2007), p.277-278.
[256] See NIC as referred by Bos (2014), p.15-16.
[257] See deBoer/Holmen/Pop-Sitar (2003), p.911.
[258] See Sheth/Sharma (1997), p.99 as well as Chou/Chou (2009), p.1037.
[259] See NEVI (n.d.), p. 12-14.

	Management Function	Questions for Analysis	% ob-serv-ed	points (1-20)	Evidence for assess-ment	Stage 1 (1-5 points, <=25%)	Stage 2 (6-10 points<=50%)	Stage 3 (11-15<=75%)	Stage 4 (16-20<=100%)
OS3	Process Involvement With Other Functions								
	Involvement audit/ compliance	Are audit and compliance included in the supplier selection process?				Audit and compliance parts are hardly involved within the supplier selection process.	Audit and compliance criteria are known for the supplier selection process.	Audit and compliance criteria are known and fully integrated within the supplier selection process.	Audit and compliance criteria are known and fully integrated within the supplier selection process. An audit and compliance department are controlling the decisions and actions of the purchasing department.
	Involvement end user in organization	How involved is the end user in the organisation(business) in the purchasing process?				Business is hardly involved in purchasing process.	Business needs and requirements are known within the purchasing process.	Business is participating in the purchasing process. Business needs and requirements are known within the purchasing process.	Business is actively participating in the purchasing process. Business needs and requirements are known within the purchasing process.
PO8	Contract Management								
	Governance	Is the role of contract manager clearly described in terms of responsibilities/tasks? Is there enough support and mandate within the organisation to perform their tasks?				Contract management is an additional task of a purchaser.	Contract management is dedicated to specific contract managers.	Tasks and responsibilities for contract managers are clearly defined and known.	Contract managers have much influence in important contract related decisions.
	Service delivery	Is the performance of a contract measured?				Contracts are managed in a more administrative way.	Contracts are actively managed. KPI's are identified and known.	Contracts are actively managed. KPI's are identified and assessed.	Contracts are actively managed. KPI's are identified and assessed. Contract managers play a role in the development of a supplier.
	Relation management	Is there an intensive effort to manage relations with suppliers?				Suppliers are awarded for performance. Communication between buyer and supplier is regularly .	Same + intern all stakeholders have access to contracts	Same + structured and formalised communication.	Same + clear escalation procedures.
	Contract administration	Is there an actively managed contract administration?				Contracts are centrally stored and easily accessible.	Systematical process of contract storage and managing the basics (e.g. termination procedures).	Software is used to manage and store contracts.	Same + insights in changes from the business that affect contracts and procedures for adapting contracts.

Figure 5 Added questions in maturity profile of Schiele (2007)

Sampling

The sampling for this research is deducted from the sampling method Schiele (2007) used in his research. In the research of Schiele (2007), interviews were conducted with the Corporate Procurement Officer (CPO), two purchasing employees and heads of other relevant departments.[260] Subsequently, the researcher filled in the maturity profile and discussed the results with the

[260] See Schiele (2007), p.278.

purchasing department.[261] The study of Bemelmans et al. (2015) also conducted interviews to fill out their maturity model for buyer/supplier relationship management.[262]

In the current research, five interviews were conducted. The number of interviews is discussed with the Professor from the University and the case company. Just like in the research of Schiele (2007), several positions within the purchasing department are interviewed. The interviewees are employees working at the centralised purchasing department from all kind of positions and levels. At first the senior manager contract management is interviewed to represent the contract management part of the department from a well-experienced level. Subsequently, one contract manager was interviewed who was relatively new in the function of contract manager (< 1 year) for a "fresh" view. Additionally, both buyers were interviewed because they are operating in different commodity types; mainly IT and mainly HRM/Marketing. Because of these two complete different commodity types, a different perspective will probably exist on the maturity level of the purchasing department. At last, the CPO is interviewed who could tell more specific about the purchasing vision and HRM/target related topics. For this research, it is chosen to interview contract managers instead of heads of other relevant departments as Schiele (2007) did in his research.[263] The focus is on employees of the centralised purchasing department as the survey is also conducted among suppliers who have a relationship with the centralised purchasing department. Because the interrogation of different functions within the purchasing department, at least one of the interviewees could give an answer on each question and also both operating and strategic points of view are covered.

Data collection

In total five interviews are conducted; one with the CPO, one with the senior manager contract management, one with a contract manager and two with a buyer. These interviews lasted between one hour with a buyer and three hours with the CPO and senior manager contract management. These interviews were recorded and afterwards the maturity profile for each of the interviewees was filled out by the researcher. The interviewees were told they could quit at any time during the interview or could skip the question as soon as they did not know an answer. In Table 8 Overview interviewees, the characteristics of the interviewees are shown. The conduction of interviews was simultaneous with the collection of the questionnaires from the first quantitative part.

[261] See Schiele (2007), p.278.
[262] See Bemelmans/Voordijk/Vos/Dewulf (2015), p.186.
[263] See Schiele (2007), p.278.

Table 8 Overview interviewees

Function of interviewee	*Number of employees interviewed*	*Duration interview*
CPO	1	2,5 hour
Senior manager contract manager	1	2,5 hour
Buyer	2	1 and 1,5 hour
Contract manager	1	1,5 hour

Data analysis

The five interviews are recorded. All recordings are listened back and elaborated. Every interview is processed in a separate maturity profile. In the end, all scores of the five interviews are summed up and divided by 5. Sometimes not all questions were answered detailed enough or not at all because employees with several function types were interviewed. As soon as a question was not answered, this particular question was not scored and taken into account in the overall score. Because there are five interviews, answers can be compared and verified to come up with the most proper score in the end. All answers of the interviewees were taken into account in the final maturity model. A short justification for each question and its corresponding level is outlined in the final model.

6.4 Part three: How to mix the qualitative and quantitative results

This research has a quantitative and qualitative character which is already mentioned before. This paragraph outlines the method which is used to process the results of the quantitative and qualitative part together. The maturity model is a qualitative assessment based on interviews with five different employees of purchasing. The supplier satisfaction survey has 79 respondents and is a quantitative assessment. Therefore it is difficult to draw statistical conclusions out of these two different measurements together. Because of respondents issues it is difficult to link maturity and supplier satisfaction/maturity perception in a quantitative way therefore it is measured in a qualitative way.

The questions from the survey and maturity model are put in an Excel-file in which also the question code is mentioned. Subsequently in a new file, the questions were matched based on topic or purpose. Because two different existing set of questions with some adjustments are used, the questions do not have the same covering/meaning and are not easy to compare. The existing questionnaires had already been found useful in previous research. Therefore hardly any adjustments were made to make the questions more equally. This research has an exploratory character and therefore at first a look is taken on what can be matched in these two different kinds of questionnaires. This choice is made to see if there is any possible noticeable remark before complete new questionnaires are composed. The approach of making this comparison tool is shown in Table 9 Characteristics qualitative part vs. quantitative part.

Table 9 Characteristics qualitative part vs. quantitative part

	Qualitative research (maturity model)	*Quantitative research (supplier satisfaction survey)*
Number of respondents out of approached	5 out of 5	79 out of 118
Number of constructs	5: • Planning • Organisational Structure • Process Organisation • Human Resources and Leading • Controlling	6: •Maturity Perception •Supplier Satisfaction •Reliability •Innovation Potential •Contact Accessibility •Involvement
Total questions for constructs	63	25
Number of questions used for comparison	12 and final score	25 questions and overall satisfaction score

From the quantitative part, several constructs are found to have a significant relationship/impact on maturity perception and indirectly on supplier satisfaction. So only these questions of the constructs that are found to be significant in the quantitative Smart PLS 3.0 analysis are connected to questions of the maturity model which have about the same aim or content. This resulted in seven "topics"; are (1) Innovation, (2) Operative excellence, (3) Relation management, (4) Negotiation, (5) Early supplier involvement, (6) General maturity/satisfaction and (7) Final score. The questions of the quantitative analysis are mixed up and are not in the same construct as they were in the quantitative analysis anymore. Specifically is looked to content, meaning and special topic of the question. In Appendix E Comparison matrix supplier satisfaction survey and maturity model, the comparison matrix of the questions from the supplier satisfaction survey and the maturity model in their new "topic" are visible.

Next step is to fill out the combination matrix with the average scores of the questions. The difference between the score of the supplier satisfaction survey and the score of the maturity model is taken to see how much these deviate from each other. This comparison is an extra check to see if the perception of the suppliers is more or less the same as the purchasing department indicates in the maturity model. From this, a conclusion can be drawn how much deviation there is from the actual maturity level. Additionally, a conclusion can be made on whether the factors impacting maturity perception need to have that much attention because there can be a large difference in perception and actual maturity.

7. Part one: Analysis and results of the quantitative survey part in which four factors are important in maturity perception

7.1 The proposed research model tested to identify the factors that are important for maturity perception

This chapter tests the proposed model of the quantitative part of the research as shown in Figure 3 Proposed research model quantitative part. The factors are tested in SmartPLS 3.0.[264] Six factors are pointed towards maturity perception and maturity perception is pointed to supplier satisfaction. The model is tested by use of bootstrapping with 5000 subsamples and a significance level of 0.05 with a one-tailed test type. 5000 subsamples for bootstrapping are considered to be enough as this number is "sufficiently close to infinity for usual situations".[265] A one-tailed test type is suggested to use as soon as the coefficient is expected to be either positive or negative.[266] The model including the results are presented in Figure 6 Results of first quantitative research model in Smart PLS 3.0 and in Table 10 Bootstrap and effect statistics of the first quantitative model (bootstrap samples = 5000).

In analysis of the results, the R^2 and the significance of the path coefficients are of importance.[267] The R^2, also called coefficient of determination, is the variance in the dependent variable that is explained by the independent variables.[268] As a rule of thumb in analysing this R^2, values of 0.75, 0.50 or 0.25 can respectively be interpreted as substantial, moderate or weak.[269] The R^2's of the tested model can be perceived as moderate. The R^2 of maturity perception is 0.652 and the R^2 of supplier satisfaction is 0.462. Especially, the R^2 of maturity perception can be regarded as good because this is close to the 0.75 which states the R^2 is substantial.

Subsequently the path coefficients are evaluated. As soon as a path is found to be non-significant or the sign of the coefficient is contradictory to the hypothesis direction, the hypothesis is rejected.[270] When a path is significant the hypothesis is empirically supported.[271] Besides, the hypothesis can be generalised from the sample to a population as soon as the path is significant.[272] A path is significant as soon as the t-value is above 1.96 corresponding to a 0.05 significance level

[264] See Ringle/Wende/Becker (2015).
[265] Henseler/Hubona/Ash Ray (2016), p.11.
[266] See Knock (2015), p.1.
[267] See Henseler/Hubona/Ash Ray (2016), p.11.
[268] See Hair/Black/Babin/Anderson (2014), p.152.
[269] See Hair/Ringle/Sarstedt (2011), p.147.
[270] See Hair/Ringle/Sarstedt (2011), p.147.
[271] See Hair/Ringle/Sarstedt (2011), p.147.
[272] See Henseler/Hubona/Ash Ray (2016), p.11.

or a t-value of above 2.58 is corresponding with a 0.01 significance level.[273] Besides the t-value, the f^2 is also important to assess the effect size for the population. The effect size is the estimation that the significant relationship also exists in the population.[274] Effect sizes of 0.02, 0.13 or 0.26 can be respectively seen as estimates for small, medium or large effect sizes for the population.[275]

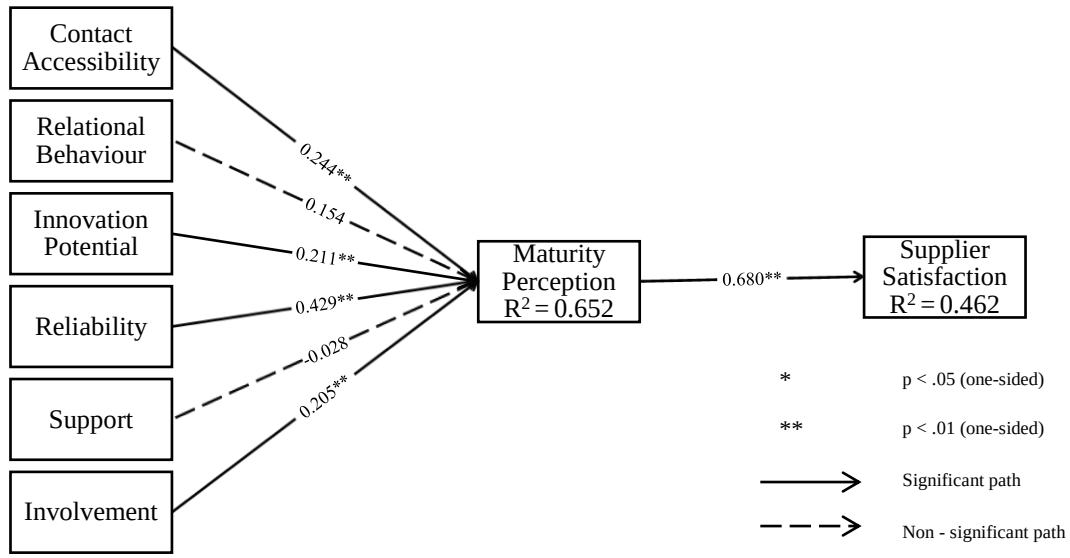

Figure 6 Results of first quantitative research model in Smart PLS 3.0

In hypothesis 1, six factors are related to maturity perception to see if there exists a relationship. Four of these sub hypotheses have been found significant and two have been found non-significant. At first, contact accessibility (H1a: t = 2.947, β = 0.244. f^2 = 0.157) has been found significant at a 0.01 significance level. Second sub hypothesis, relational behaviour (H1b: t = 1.388, β = 0.154, f^2 = 0.034), have not been supported since the significant level is higher than 0.05. The third sub hypothesis innovation potential (H1c: t = 2.586, β = 0.211, f^2 = 0.079) and fourth sub hypothesis reliability (H1d: t = 4.164, β = 0.429, f^2 = 0.308), have both been found significant at a 0.01 significant level and thus have an impact on maturity perception. Subsequently, support (H1e: t = 0.387, β = -0.028, f^2 = 0.002) has also no relationship with maturity perception as this t-statistic is far from the desired 1.96. Involvement (H1f: t = 2.985, β = 0.205, f^2 = 0.075) is the last relational factor which has an impact on maturity perception.

The second hypothesis is about the influence of maturity perception on supplier satisfaction. This hypothesis is supported at a significance level of 0.01 (H2: t = 13.872, β = 0.680, f^2 = 0.859). The relation between maturity perception and supplier satisfaction is the strongest

[273] See Hair/Black/Babin/Anderson (2014), p.71.
[274] See Hair/Black/Babin/Anderson (2014), p.2.
[275] See Cohen/Cohen/West/Aiken (2013), p.93.

relation found in the model as the t-statistic is even 13.872. The next paragraph controls the four factors impacting on maturity satisfaction in a revised model.

Table 10 Bootstrap and effect statistics of the first quantitative model (bootstrap samples = 5000)

Paths	*β*	*SE*	*t*	f^2
CA → MP	0,244**	0,083	2,947	0,157
RB → MP	0,154	0,111	1,388	0,034
IP → MP	0,211**	0,081	2,586	0,079
R → MP	0,429**	0,103	4.164	0,308
S → MP	-0,028	0,073	0,387	0,002
I → MP	0,205**	0,069	2.985	0,075
MP → SS	0,680**	0,049	13,872	0,859

Note: β =standardised coefficient, SE = standard error of β, t= t-statistic, SE standard error of beta, f^2= effect size of variance explained by predictor, * = p < .05 (one-sided), ** = p < .01 (one-sided), CA = Contact accessibility, IP = Innovation potential, R = Reliability, S = Support, I = Involvement, RB = Relational behaviour, MP = Maturity perception, SS = Supplier satisfaction

7.2 Reliability, Involvement, Contact Accessibility and Innovation Potential: Important factors in maturity perception

Next step is to compose a revised model in which all constructs which have an influence on maturity perception are presented. Retesting must show if these factors still have an impact. As soon as these constructs improve, the maturity perception of the supplier of the buyer increases and indirectly the supplier satisfaction will increase. In Table 11 Quality criteria revised model and Table 12 HTMT-ratio and correlations revised model, the quality criteria of the revised model are shown. The cross loadings of this model are presented in Appendix F Cross loadings revised model.

All quality criteria are met. The Cronbach's alpha is for all factors above 0.766 and thus above the 0.7 threshold. [276] Also CR is very high as these values are all above 0.864 and far above the threshold of 0.6. [277] Subsequently the AVE is exceeding the threshold of 0.5 in all cases. [278] The discriminant validity of the revised model is also good enough. All VIF are below the threshold of 5. [279] Also no correlation is higher than the square root AVE, so the Fornell and Larcker criterion (1981) is also met. [280] Lastly, the HTMT-ratios are still good as they do not exceed the threshold of 0.85. [281]

[276] See Bagozzi/Yi (1988), p.82; Hair/Ringle/Sarstedt (2011), p.145; Hair/Black/Babin/Anderson (2014), p.125 as well as Henseler/Hubona/Ash Ray (2016), p.12.
[277] See Bagozzi/Yi (1988), p.82 as well as Henseler/Ringle/Sinkovics (2009), p.300.
[278] See Bagozzi/Yi (1988), p.82; Hair/Ringle/Sarstedt (2011), p.145; Hair/Ringle/Sarstedt (2013), p.7 as well as Hair-Black-Babin-Anderson (2014), p.605.
[279] See Hair/Ringle/Sarstedt (2011), p.147.
[280] See Fornell/Larcker (1981), p.48.
[281] See Henseler/Ringle/Sarstedt (2015), p.128.

Table 11 Quality criteria revised model

	AVE	*√AVE*	*CR*	*Cronbach's alpha*	R^2	*Inner VIF*
Contact accessibility	0,778	0,882	0,913	0,858		1,044
Innovation potential	0,680	0,825	0,864	0,766		1,548
Reliability	0,734	0,857	0,917	0,878		1,060
Involvement	0,715	0,846	0,883	0,803		1,479
Maturity perception	0,625	0,791	0,930	0,914	0,641	1,000
Supplier satisfaction	0,690	0,831	0,898	0,851	0,461	-

Note: AVE = Average variance extracted, CR = Composite reliability, √AVE = value for assessing the Fornell and Larcker (1981) statistic of discriminant validity (Criterion is √AVE > r,), VIF = Variance inflation factor

Table 12 HTMT-ratio and correlations revised model

	Contact accessibility	*Innovation potential*	*Reliability*	*Involvement*	*Maturity perception*	*Supplier satisfaction*
Contact accessibility		0,181	0,133	0,094	0,396	0,365
Innovation potential	0,218		0,216	0,568	0,506	0,430
Reliability	0,184	0,253		0,147	0,632	0,587
Involvement	0,177	0,720	0,173		0,443	0,408
Maturity perception	0,442	0,594	0,695	0,507		0,679
Supplier satisfaction	0,387	0,506	0,665	0,483	0,739	

Note: Left corner HTMT ratio, right corner correlations

Still, the quality criteria are met, so the revised model is tested in SmartPLS 3.0 by use of 5000 bootstrapping sub samples. In Figure 7 Results of revised model of quantitative analysis in Smart PLS 3.0 and Table 13 Bootstrap and effect statistics of revised model (bootstrap samples = 5000), the results of the revised model are shown. The factors which have been found significant in the first model are still significant in this revised model. Contact accessibility (H1a: t = 3.387, β = 0.266. f^2 = 0.189), innovation potential (H1c: t = 2.870, β = 0.224, f^2 = 0.090), reliability (H1d: t = 7.056, β = 0.517, f^2 = 0.701) and involvement (H1f: t = 3.291, β = 0.215, f^2 = 0.087) have been supported to have an impact on maturity perception at a 0.01 significance level. Especially, the reliability factor has an enormous impact because of a standardised regression coefficient of 0.517 and a t-statistic of 7.056. Besides these four factors, maturity perception also still has a substantial effect on supplier satisfaction (H2: t = 13.726, β = 0.679, f^2 = 0.856).

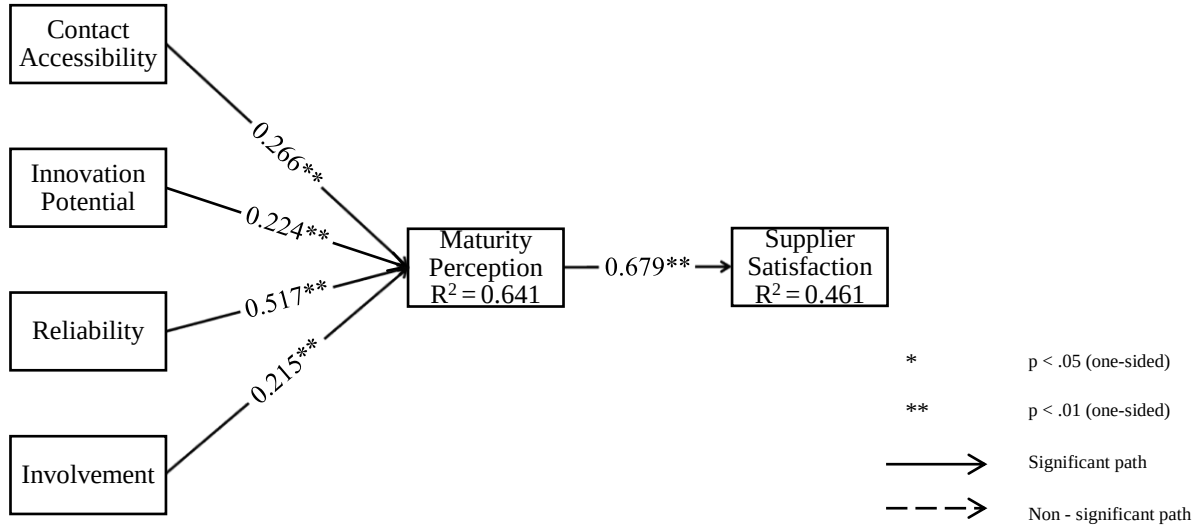

Figure 7 Results of revised model of quantitative analysis in Smart PLS 3.0

Table 13 Bootstrap and effect statistics of revised model (bootstrap samples = 5000)

Paths	*β*	*SE*	*t*	f^2
CA → MP	0,266**	0,079	3,387	0,189
IP → MP	0,224**	0,078	2,870	0,090
R → MP	0,517**	0,073	7,056	0,701
I → MP	0,215**	0,065	3,291	0,087
MP → SS	0,679**	0,049	13,726	0,856

Note: β =standardised coefficient, SE = standard error of β, t= t-statistic, SE standard error of beta, f^2= effect size of variance explained by predictor, * = p < .05 (one-sided), ** = p < .01 (one-sided), CA = Contact accessibility, IP = Innovation potential, R = Reliability, I = Involvement, MP = Maturity perception, SS = Supplier satisfaction

In the end, an additional confirmatory factor analysis (hereinafter called as CFA) in SPSS in conducted to see if the items that remain with each factor are indeed part of a single factor. See Appendix G Factor analysis for an overview of this CFA. The CFA is conducted to extract six factors with both varimax rotation and oblimin rotation and shows that the items remain more or less at their factor. The Kaiser-meyer-olkin measure of sampling adequacy test confirms that separate factors exist because the statistic is 0.833 and consequently above the threshold of 0.5.[282] Also, the Bartlett's Test of Sphericity is significant which is also necessary to have separate factors.[283] To conclude, the CFA confirms there are six factors in the tested model that are corresponding with the factors of the SmartPLS 3.0 results.

[282] See Hair/Black/Babin/Anderson (2014), p.103.
[283] See Hair/Black/Babin/Anderson (2014), p.103.

8. Part two: Results from the maturity model where process organisation scores low and organisational structure scores high

8.1 A general overview of the maturity of a financial services organisation

This chapter presents the results from the maturity model. In this research a current maturity model is adapted for service organisations. Previous literature suggested to look at maturity models for service organisations because they may require a different set of criteria. [284] It is also questioned whether the level of maturity for service organisations needs to be the same for every organisation.[285] This paragraph discusses the results in general, compared to previous research and also remarkable points deriving from the five conducted interviews with employees of the centralised purchasing department.

Figure 8 Overview All Dimensions shows the level per dimension. The average maturity level is 10.22 points on a 20 point scale which is 51%. So, the case company just enters the third maturity stage. The maturity model of Schiele (2007) was tested in 14 metal-part industry firms and resulted in a maturity level varying from 36% to 55%.[286] None of his case companies reached the highest level in one of the dimensions.[287] The case company of this research, a financial services organisation, is a complete different type of organisation, but also scored a maturity level in the range of the case companies of Schiele (2007). Also in the financial services organisation, none of the dimensions reached the highest level.

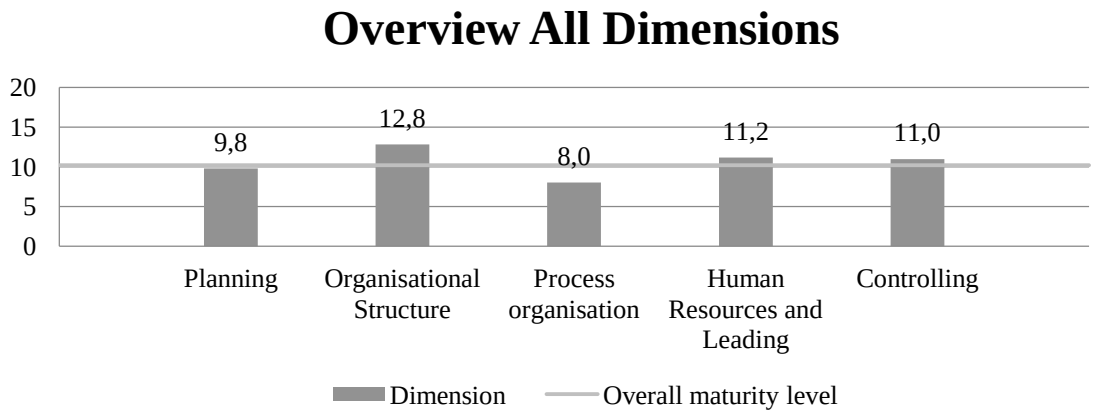

Figure 8 Overview All Dimensions

First remarkable point deriving from the interviews was the supporting function of purchasing. The purchasing department has no budget and therefore has no hard mandates. Purchasing gives

[284] See Schiele (2007), p.283.
[285] See Schiele (2007), p.283 as well as Úbeda/Alsua/Carrasco (2015), p.179.
[286] See Schiele (2007), p.280.
[287] See Schiele (2007), p.280.

mandatory advice to the business lines that have the budget and decides what is purchased. However, the business lines must mandatory consult purchasing for purchases above €10.000 or with a high risk. As mentioned before, service organisations do mostly NPR purchases and this is also applicable for the case company. This has much influence in the arrangement of processes and the maximum level of maturity they can reach.

Subsequently, completing the maturity model also showed some difficulties. The stages of some questions are difficult to assign because they included some global/multinational aspects. For example an organisational structure question: 'Is purchasing integrated in the purchasing network of the group' has as final stage 'Purchasing is integrative part of the worldwide procurement network of the group'. For the case company this stage was not applicable. So even after adapting the maturity model of Schiele (2007), some questions or parts of stages are still not applicable for the case company.

A final general remark about the interviews is the awareness of the employees about what they need to change. The department exists for three years now and step by step they are taking steps in professionalising. This year they start with the next step; implementing supplier governance. With this supplier governance they want to invest more in partnership/collaboration with suppliers. Another point that almost all interviewees mentioned is that always needed to be questioned what level of maturity is desired for a certain aspect. The next paragraph outlines the different dimensions of the maturity model more specific.

8.2 An overview of the most important results per dimension; organisational structure is the most mature, process organisation is least mature

Purchasing has no budget and consequently does not decide what is purchased or not. They have the role of "trusted advisor" and have to be consulted mandatory before something is purchased. This also has consequences for the maturity level in the parts of each dimension. Purchasing cannot only decide what is purchased or not. Consequently purchasing has no fully mandate in for example the demand planning as they are dependent on the business lines. This paragraph decomposes each dimension into different parts and gives a short explanation for extreme low or high levels.

At first planning, the scores of each part within planning are visible in Figure 9 Dimension Planning. The demand of the organisation is driven from the business lines. Purchasing its task is to keep in touch with the business lines and by use of meetings and year plans to identify and discuss the demand. However, as the purchasing department is relatively new within the organisation (for about three years), still some ad hoc demand occurs. Innovation planning is scoring the lowest, this because they do not anticipate beforehand on technological trends. A technological roadmap of the

own company exists but is not known enough by everybody in the organisation. Technological roadmaps are only available from strategic suppliers.

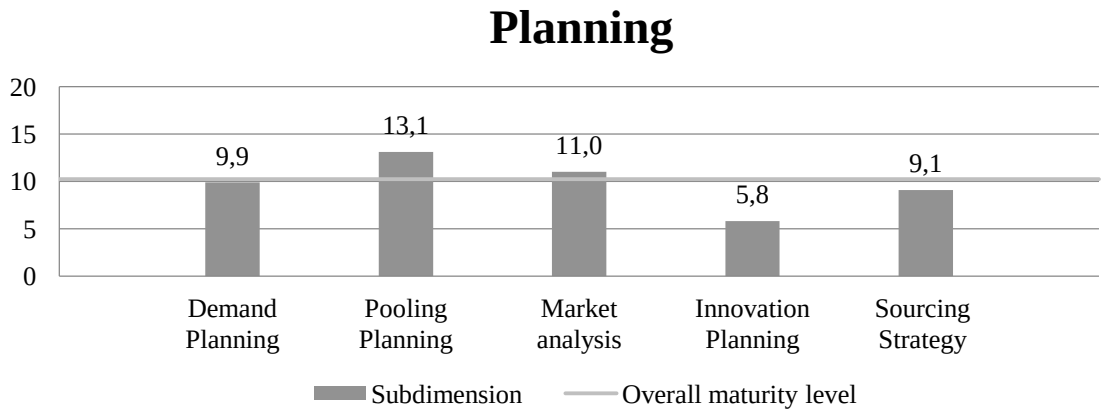

Figure 9 Dimension Planning

The second dimension is organisational structure; the decomposition of scores is visible in Figure 10 Dimension Organisational Structure. The integration of purchasing within the organisation has already entered the third maturity stage because of a score between 10 and 15 points. Purchasing is responsible for what is purchased but does not decide what is purchased so they keep company with the business lines to guide the purchasing processes. The integration between purchasing and for example audit and compliance is also good. Clear tasks and responsibilities are defined in the process of for example the Business Partner Due Diligence check.

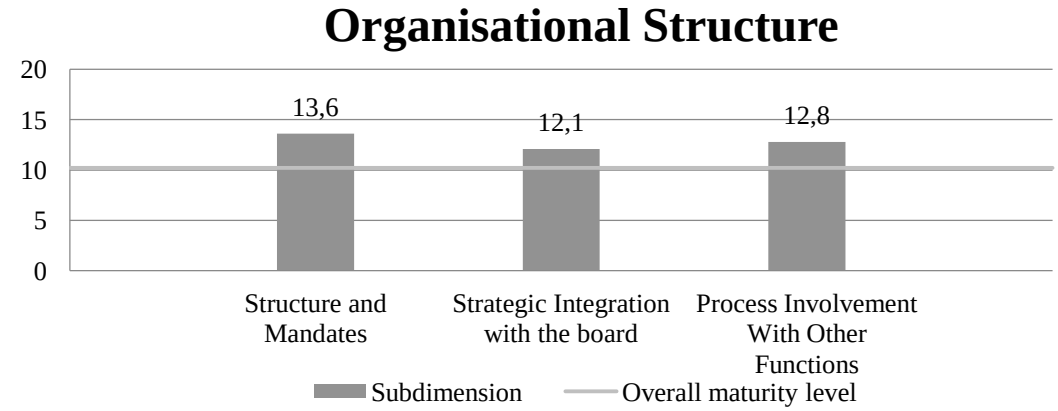

Figure 10 Dimension Organisational Structure

The dimension process organisation is scoring the lowest of all dimensions. In Figure 11 Dimension Process Organisation, it is visible that two of the eight parts of this dimension are scoring in the first maturity level (score 0-5 points). These parts, supplier evaluation and supplier satisfaction, are incidentally applied and do not know a structured (documentation) process. Only in case of contract breach or contract renewal the supplier is evaluated, but not in a systematic

structural way. Supplier satisfaction is also not consequently measured and therefore scores in the first maturity stage. Supplier satisfaction was measured for the first time in the case company as side product of this paper. Contrary to the low scoring supplier satisfaction and supplier evaluation, the new added dimension contract management is scoring high. Within the case company contract management is considered of high importance. Special contract managers are assigned to manage the contracts. They maintain a relationship with the supplier and make sure the contract administration is properly arranged. They also receive much support from the business lines and have clear defined tasks and responsibilities. Therefore purchasing scores high in contract management

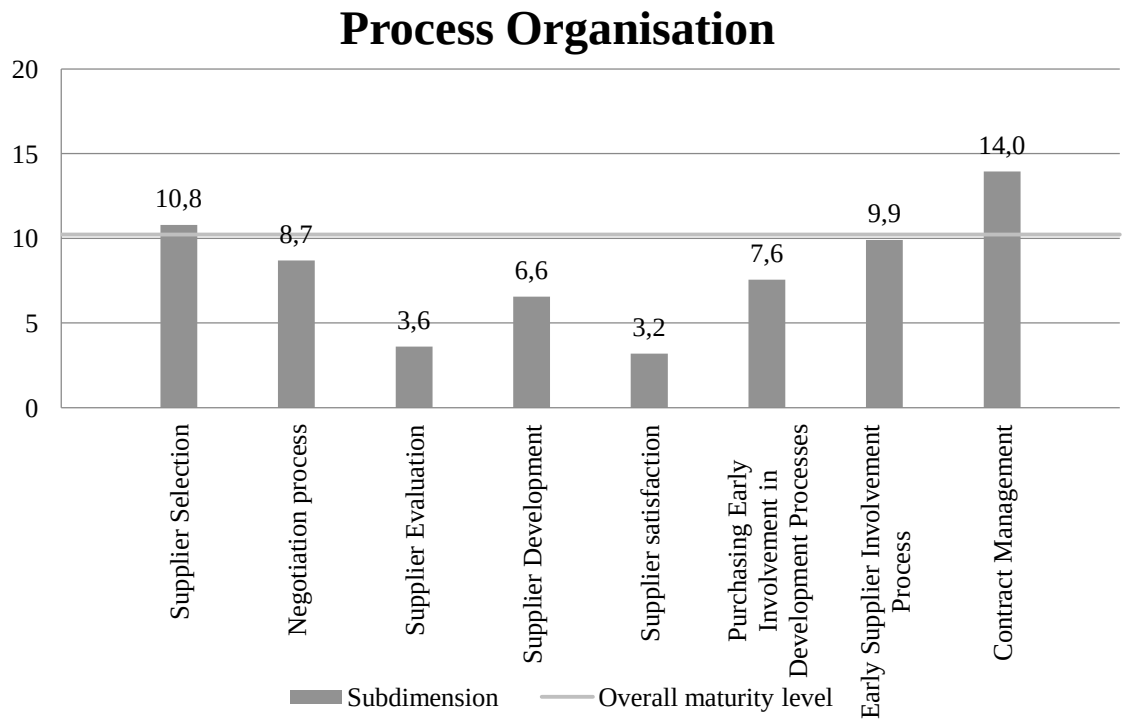

Figure 11 Dimension Process Organisation

The fourth dimension is shown in Figure 12 Dimension Human Resources and Leading. Selection of personnel occurs via standardised processes of the human resources department. The purchasing department is relatively small so therefore there is no frequent demand for new personnel. Training and development programs are not standard available but are tailor made per employee because the department is small. Performance of employees is measured in the annual review cycle but also in (two) weekly manager/employee meetings.

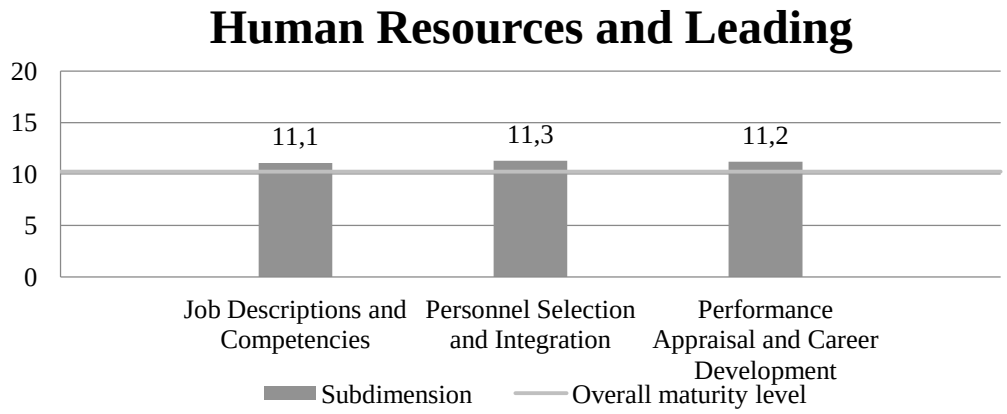

Figure 12 Dimension Human Resources and Leading

The last dimension is presented in Figure 13 Dimension Controlling. Employees do have targets at individual level but also at department level. Qualitative targets like the satisfaction of the business lines are more important as quantitative targets like savings. This is because savings are difficult to measure; as soon as a contract is negotiated the difference in start price - final price could be used to calculate a saving. Additionally, eliminating a whole supplier could be a saving as well. Also, it would be strange to calculate savings at both purchasing and the actual department who has the budget while purchasing has no budget. Still, savings are measured but as soon as they are deviating from the targets this has no hard consequences for purchasing employees. Audit, compliance and risk control purchasing in their processes. The case company also has many supportive IT tools; among others systems for contract management, tender process, mark information and financials.

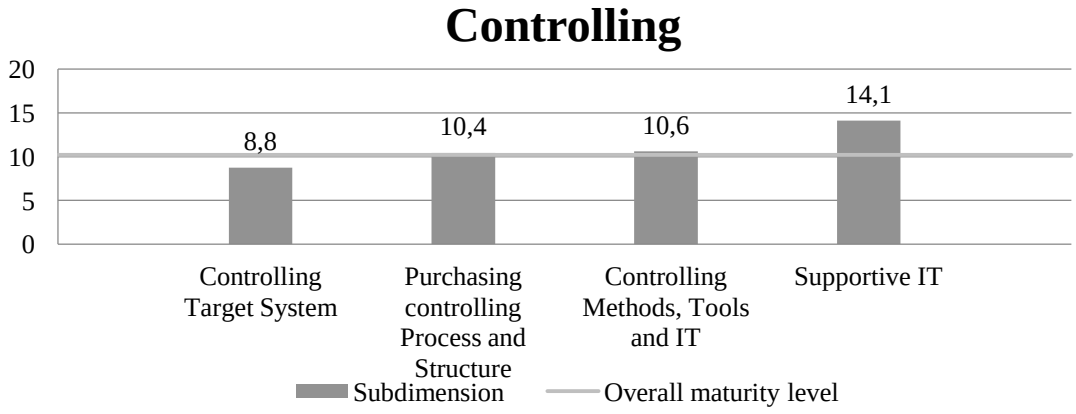

Figure 13 Dimension Controlling

9. Part three: Combination of survey and interview results to identify differences where suppliers perceive maturity more positive as the actual maturity level

This last results chapter presents the outcomes of the third part of this research. In this third part, the previous found quantitative results and qualitative results are related to each other. The combination matrix' shown in Appendix E Comparison matrix supplier satisfaction survey and maturity model, is used to make this comparison. The main purpose of this comparison is to identify possible gaps between the maturity perception of suppliers and the actual maturity level of purchasing of the buyer.

Contact accessibility, innovation potential, reliability and involvement are the factors which have an impact on maturity perception since they are proved significant in the first quantitative part of this research. The questions of the survey which are applicable to these questions were divided into new 'topics'. Consequently these questions are put against questions of the maturity model which have about the same coverage. The topics which derive from this comparison are (1) innovation, (2) operative excellence, (3) relation management, (4) negotiation, (5) early supplier involvement and (6) general maturity/satisfaction. To conclude the final grade of the survey and the overall maturity level are compared in (7) final grade. The averages of each separate question are filled in the comparison matrix' and in the end an average score per topic of each the supplier and buyer arises. In Figure 14 Gaps between supplier and buyer and Figure 15 Deviation in scores between supplier and buyer, the results of the comparison are presented.

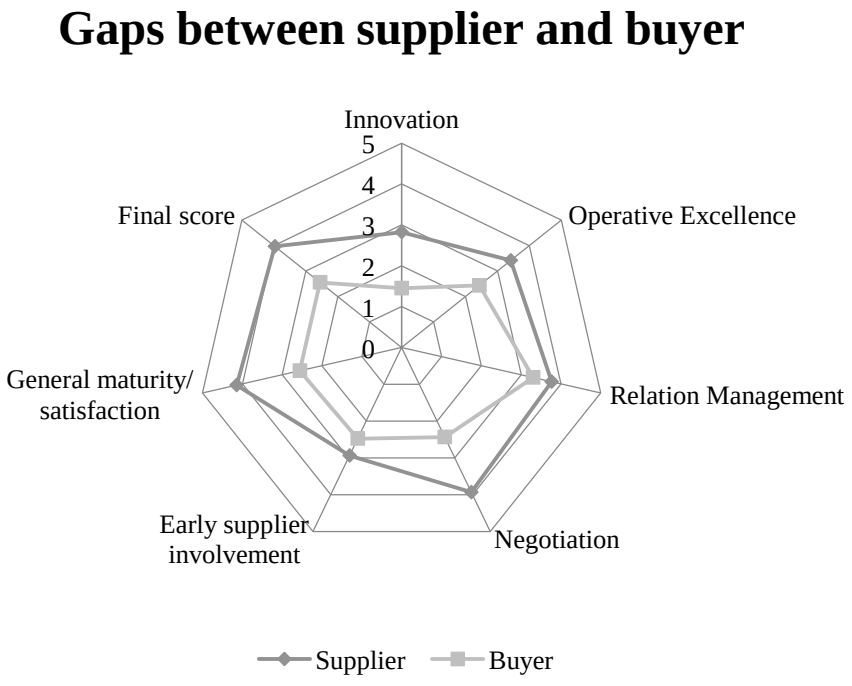

Figure 14 Gaps between supplier and buyer

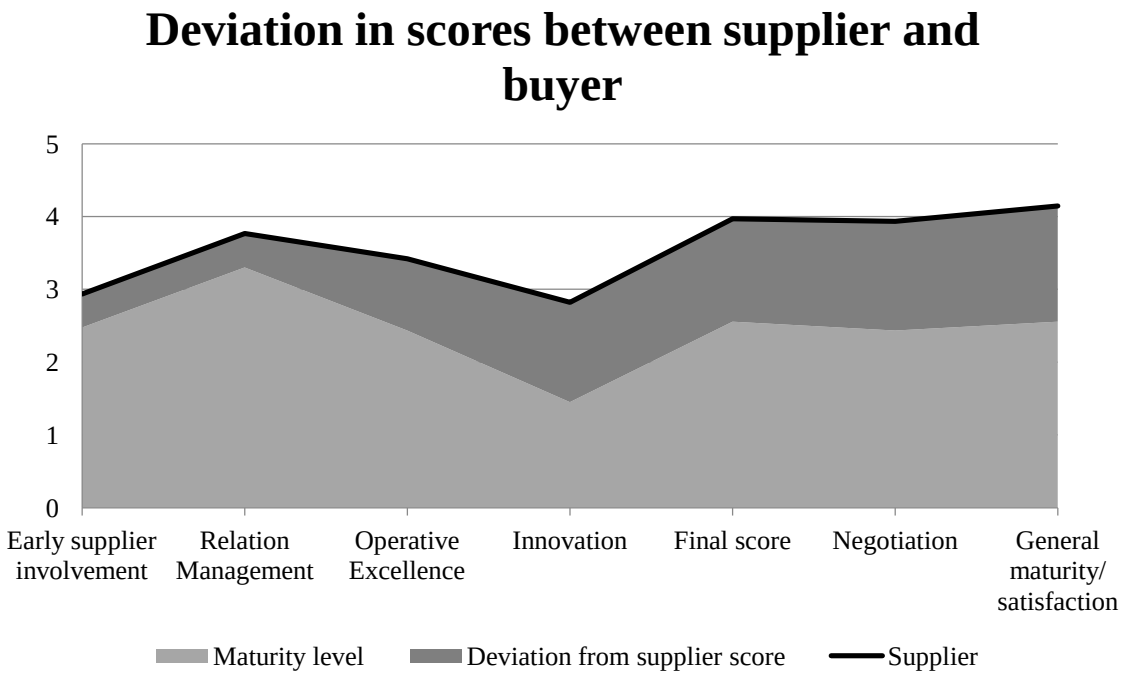

Figure 15 Deviation in scores between supplier and buyer

What is remarkable about these results is that suppliers perceive the buyer's purchasing function more mature than the buyer itself. All topics score higher means at the supplier side, than at the buyer side. The topic (5) early supplier involvement has least deviation in scores between buyer and supplier; the opinions are more or less the same. (7) Final score, (4) negotiation and (6) general maturity/satisfaction show all three most deviation in scores.

Additional remark to this analysis is that questions are not literally asked in the same way to the supplier and buyer. Existing questionnaires are used for the first two parts of this research. However they are adapted a bit, the questions are still too less aligned to each other. Reason why the existing questionnaires are not adapted too much is because they are used in previous research.

To conclude, the questions of supplier and buyer may be not enough the same. Still, the opinion of the supplier seems a lot more positive than of the buyer. So, differences in opinion between maturity perception of the supplier and the actual maturity level of the buyer's purchasing function can be assumed, but this requires further research.

10. Four factors important for maturity perception: Discussion and implications

10.1 Discussion

This paper investigates to what extend suppliers perceive the maturity of purchasing. The factors influencing maturity perception and the difference between perceived and actual maturity level are investigated at one financial service organisation to do a first attempt. All results are presented in the previous chapters and consequently the results are discussed in this chapter. First the research question and sub questions of this study are addressed again:

RQ *"What do suppliers perceive as maturity of purchasing?"*

SQ1 *"Which factors influence the supplier its perception of the buyer its maturity?"*

SQ2 *"What adjustments need to be made in the current maturity models to make it suitable for a service organisation?"*

On the one hand, the quantitative part of the research identified four factors influencing maturity perception of suppliers; contact accessibility, innovation potential, reliability and involvement. On the other hand, a difference is visible between the maturity perception of suppliers and actual maturity level; the suppliers perceive the maturity level more mature.

First, the four factors are discussed. Contact accessibility indicates how easy and often the buyer is contacted.[288] So, having a central contact person is crucial in the maturity perception of suppliers. The effect size of contact accessibility on maturity perception of $f^2 = 0.189$ is medium which means that improving contact accessibility has a medium effect on maturity perception of suppliers. In innovation potential, suppliers need to get involved in the buying organisation its innovative capabilities to create more innovative ideas together.[289] Consequently, to improve the innovation potential factor, buyers should involve and give suppliers access to their innovative capabilities. Consistency and fulfilling commitments are important precursors in the factor reliability. [290] If a buyer wants to improve the factor reliability, he needs to work on consistent procedures and information sharing within his organisation to ensure every employee has the same overcome to the supplier. Also, making and fulfilling fair agreements increases reliability. This

[288] See Hüttinger/Schiele/Schroër (2014), p.703.
[289] See Hüttinger/Schiele/Schroër (2014), p.703.
[290] See Hald/Cordón/Vollmann (2009), p.965.

factor has a f^2 of 0.701 which is large as a large effect size already exists above 0.26.[291] So, buyers need to be reliable in their relationship with suppliers because this contributes positively in the maturity perception of suppliers. The last factor impacting maturity perception is involvement. Involvement in NPD processes implies a buyer has clear motives, strategies and developed capabilities. [292] To involve suppliers more in NPD processes, a buyer needs to work on its facilities to make this possible.

For buyers it is beneficial to be perceived as mature by suppliers. As soon as suppliers perceive maturity at their buyer, they are more likely to get awarded preferred customer status.[293] Also supplier satisfaction can contribute in gaining preferred customer status and indirectly preferential treatment sooner.[294] The factors contact accessibility, innovation potential, reliability and involvement contribute positively to maturity perception. The R^2 of these factors on maturity perception is high as this has a value of 0.641. So, these factors explain much of the maturity perception factor. Additionally, maturity perception is also positively related to supplier satisfaction. This also has a relative high R^2 of 0.461 which means that maturity perception explains almost half of supplier satisfaction. The effect size of maturity perception on supplier satisfaction is also substantial high as the $f^2 = 0.856$. So, a large effect size of the significant relationship of maturity perception on supplier satisfaction is possible in the population.[295] In the end, supplier satisfaction indirectly increases if buyers pay attention and improve to the four factors.

On the other hand, the results of these important factors are compared with the actual maturity level to see how much they deviate. So, the second part of the research comprised the completion of the maturity model for service organisations to measure the actual maturity level in the case company. The maturity model of Schiele (2007) is adjusted to make it suitable for a service organisation. Although the maturity model was adjusted, it could be questioned if it was adjusted enough. Testing the adjusted maturity model in the case company showed some difficulties as the purchasing budget of the case company is from the business lines and not from purchasing. The function of purchasing is a mandatory advisory role towards the business lines. So, some difficulties occur with completing this maturity model because of their advisory role. For example, the demand is business driven instead of purchasing driven because of this division. Therefore, it could be questioned either if this case company has a decent maturity level because of

[291] See Cohen/Cohen/West/Aiken (2013), p.93.
[292] See Walter (2003), p.729.
[293] See Bemelmans/Voordijk/Vos/Dewulf (2015), p.194.
[294] See Schiele (2012), p.44; Bemelmans/Voordijk/Vos/Dewulf (2015), p.194 as well as Vos/Schiele/Hüttinger (2016), p.4613.
[295] See Hair/Black/Babin/Anderson (2014), p.2.

organisational choices or the model needs more adjustments for service organisations with a more advisory role. Both options should be further investigated.

At the moment, the case company has put maximum effort in their maturity of the purchasing functions and is still continuing to improve their processes and policies. The case company should focus on improving their innovation planning and processes at first. These topics scored low in the maturity model. Innovation planning, purchasing its early involvement in NPD processes and early supplier involvement in NPD processes obtained respectively a score of 5.8, 7.6 and 9.9 on a 20 point scale. The case company also indicated that they want to invest more time in innovation processes so a logic first step would be to improve the innovation processes. Additionally, the dimension organisation process scored low compared to other dimensions with an average score of 8 on a 20-point scale. Due to the sub dimensions supplier evaluation (score of 3.6) and supplier satisfaction (score of 3.2) this score is pressed down. These two sub dimensions are still in the first maturity stage (a score from 0 to 5). The case company is not measuring the opinion of the suppliers in a structural manner and suppliers are not evaluated according to a standard system. Case by case, suppliers are evaluated. Actions that could be taken are for example the implementation of a supplier management policy which could contribute in improving the maturity level. Supplier management can be described as "an investment by the buying firm in the supplier that may reduce transaction costs and yield a more cooperative relationship".[296] Actions that can be taken within supplier management are for example the process of "identifying, qualifying, selecting evaluating, developing and certifying suppliers".[297] Because of these activities, a more extensive relationship between buyer and supplier could be established. Additionally in the context of supplier management, a supplier management employee could be appointed to take care of supplier management and investigate further the possibilities how to fulfil this supplier management function in this particular organisation. Next to supplier evaluation and supplier satisfaction, supplier development (score of 6.6) also scored low in the maturity model. The supplier manager could also be point of contact for suppliers to work on supplier development. Part of supplier management is more intensive contact and collaboration with suppliers. Moreover, implementing more extensively supplier management contributes as well to the maturity perception of suppliers as contact accessibility, innovation potential, reliability and involvement positively affects maturity perception. The four factors also contain contact and collaboration between buyer and supplier.

Lastly, the maturity model used in this research to identify the actual maturity level should also be revised to make it suitable for service organisations as they have arranged their purchasing activities in a different manner. As managing risks in the financial services sector is a main topic, this could also be more integrated in future maturity models. Also the agreements within the

[296] Carr/Pearson (1999), p.499.
[297] Carr/Pearson (1999), p.500.

organisations about the responsibilities, mandates and budgets should be better integrated in future maturity models for service organisation. One can question whether a lack of responsibilities and budget is a sign of low maturity of purchasing. The organisational argumentation for certain choices can be of importance on what should be the desired maturity level. Also the organisational foundation for the choice of position of purchasing should be taken into account in determining the maturity level.

The third part of the research contained the comparison between the results of the important maturity perception factors and the actual maturity level. Suppliers perceive the maturity of their buyer more positive than the buyer himself. Three different explanations for this difference could be possible; image of the sector, buyer/supplier characteristics and interests and lastly measurement instruments. At first, the image of the sector could be of major importance in deciding the opinion of the suppliers. Financial service organisations are more and more subject to regulation since the financial crisis in 2007.[298] Therefore, organisations within this sector need to report more and are audited more strictly by governmental organisations in order to keep their licence. The regulations and audits of the governments result in improvements in organisational processes. Therefore suppliers could assume that because of these controls, financial service organisations have everything proper arranged and that could affect their perception of maturity.

Moreover, the different interests of suppliers and buyers should be taken into account. Even though the survey was anonymous, suppliers could have felt pressure or have a marketing intention to fill out the survey more positive than it is. The respondents of the supplier are people from sales. Sales people often exaggerate more because they need to sell their products and services. In contradiction, buyers look more critical to themselves. Buyers are also part of the organisation which is assessed and see/know everything. Suppliers only see a selective part of the assessed organisation. This could also contribute in different perspectives. As mentioned before, several studies already identified that suppliers and buyers perceive their relation[299] and maturity[300] different. The Bemelmans et al. (2015) research argued that buyers need to pay as much attention to improve the way suppliers perceive their maturity as pay attention to improve actual maturity.[301] Assigning group managers can help in increasing the maturity perception of a supplier as they have a single point of contact which ensures a clearer communication.[302]

Lastly, the measurement instruments are not enough aligned to each other to be able to make proper comparisons. Existing measurement methods are adjusted for both the survey and

[298] See vanErp (2011), p.292.
[299] See Nyaga/Whipple/Lynch (2010), p.110.
[300] See Bemelmans/Voordijk/Vos/Dewulf (2015), p.193.
[301] See Bemelmans/Voordijk/Vos/Dewulf (2015), p.193.
[302] See Bemelmans/Voordijk/Vos/Dewulf (2015), p.194.

maturity model. Both measurement instruments have already been proven in previous research[303] so not many adjustments are made to remain validity and reliability. The aim of this study is of explorative character so indicating a possible difference would already be adequate. In further research measurements should be equal to identify a true difference. The difference in this research is an indication that there may be a difference which is also likely because of supplier/buyer interests and characteristics.

To conclude, four factors contribute to maturity perception; contact accessibility, innovation potential, reliability and involvement. In order to increase the maturity perception, buyers need to improve these four factors as they positively influence maturity perception by for example, introducing supplier management. Additionally, the view of maturity of the buyer differs between buyer and supplier. The supplier perceives the maturity of the buyer more positive than the buyer. Explanations for the found difference can be image of the industry, supplier/buyer characteristics and interests and lastly measurement models which are not aligned enough. In the end, a buyer needs to focus on being perceived mature by its supplier as much as the buyer focuses on their actual maturity.

10.2 Theoretical implications

The findings of this research have impact on literature and especially on purchasing and supply literature about maturity of purchasing. The theoretical contributions of this research are four-fold.

On the one hand this study has identified four important factors in maturity perception. Contact accessibility, innovation potential, reliability and involvement positively impact the maturity perception of suppliers. These four factors are also indirectly influencing supplier satisfaction. Scarce literature is available in which factors are researched for maturity perception. This research did a first attempt in testing six relational factors where four have been found to have a relation with maturity perception and indirectly with supplier satisfaction in this case company. The theoretical contribution of this research is that the four factors contact accessibility, innovation potential, reliability and involvement explain a lot about maturity perception as the R^2 is 0.641. Especially the factors contact accessibility and reliability have a substantial effect (of respectively f^2 = 0.189 and f^2 of 0.701). So, this confirms the literature that states that having clear contact can contribute to maturity perception.[304] Additionally, literature about reliability states that reliability implies consistency.[305] Being consistent in procedures and standards is a sign of maturity as confirmed by this research. This research is the first who relates antecedents to maturity perception

[303] See Schiele (2007); Hüttinger/Schiele/Schroër (2014) as well as Vos/Schiele/Hüttinger (2016).
[304] See Bemelmans/Voordijk/Vos/Dewulf (2015), p.194.
[305] See Hald/Cordón/Vollmann (2009), p.965.

as far as known. Further research can identify more possible factors that influence maturity perception and their underlying interaction.

Also the effect of maturity perception on supplier satisfaction is investigated in this research. A good R^2 of 0.461 and a large effect size of $f^2 = 0.856$ show that maturity perception and supplier satisfaction are related to each other. Both constructs are opinions of suppliers. The factors tested on maturity perception are deduced from supplier satisfaction literature. Thus besides that both constructs contain the opinion of suppliers, they are also related to each other as the same kind of factors are tested on them. So, maturity perception can be taken into account in further research when testing additional factors on supplier satisfaction as maturity perception explains also a lot about supplier satisfaction.

On the other hand, this research has contributed to do adjustments in the maturity model of Schiele (2007) to make it applicable for service organisations. A contract management sub dimension is added to the maturity model of Schiele (2007). Additionally, questions in the maturity model are made more services oriented by adding the word service in questions and eliminating questions regarding raw material as this is hardly applicable for service organisations. The adjusted maturity model has also been empirically tested. The contract management related questions are suitable for a maturity model for service organisations as they could be filled out properly. Therefore they could be used and tested as well in other service organisations to see if they are still suitable. However, still not all questions were applicable to the service organisation, mainly because of mandates and the lack of no budget of the purchasing department. Further research could investigate whether such an organisation could reach the maximum maturity level. Previous research questions if service organisations need different maturity models and maturity levels.[306] This research observes that maturity models for service organisations need to differ from maturity models for product organisations.

Lastly, an exploratory indication of difference between maturity perception and actual maturity level is shown in this research. As far as known, this research is the first research which relates the actual maturity level of purchasing with the supplier its perception of maturity and the way they differ. Two existing measurement tools are adjusted a little before data collection. Afterwards results are compared but as the questions are not exactly aligned they do not give an exact difference. However, suppliers score higher on all points as the actual maturity level given by the buyer. Even though this difference needs further research, buyers can take advantage of the information suppliers perceive them as more positive than they perceive themselves.

[306] See Schiele (2007), p.283.

10.3 Managerial implications

Besides theoretical implications, this study is also of practical relevance. Four main contributions can be mentioned.

At first, organisations have to improve contact accessibility, innovation potential, reliability and involvement as soon as they want to be perceived more mature by their supplier. Especially, focusing on reliability improves the maturity perception as this factor has the most positive influence on maturity perception. Main reason for buyers to improve the maturity perception of suppliers is that a high maturity perception results in gaining preferred customer status sooner. This preferred customer status ultimately results in preferential treatment which can be a competitive advantage for buyers. Managers can improve the four factors by implementing more extensive supplier management. In supplier management, attention is paid to more intense contact and collaboration. So the factors innovation potential and involvement which deal with collaboration between buyer and supplier will be improved. Contact accessibility will also improve by use of supplier management as more intensive, clear and regular contact can take place. Appointing one contact person per supplier can contribute to improve clearer communication. Lastly, buyers could appoint a special supplier manager to make supplier management policy and guard the implementation of the supplier management.

The implementation of supplier management can also contribute to improve the maturity level of the organisation. Supplier processes like supplier evaluation, supplier development and supplier satisfaction scored low in the maturity model. Creating better processes around communication, relation and collaboration can contribute to achieve a higher maturity level. Innovation processes of the case company also scored low in the maturity model. A technology roadmap of the own organisation is existing but not enough shared and known within the purchasing department. Organising innovation workshops internal and external can contribute in a higher maturity level. Internal workshops can take place between the business lines and purchasing and external workshops can be organised with purchasing and suppliers (maybe even the business lines as they have the budget). The external workshops strengthen the collaboration between buyer and supplier. Technological roadmaps could be exchanged between buyer and supplier to align innovations better. Therefore also the earlier mentioned factors innovation potential and involvement impacting maturity perception can be positively influenced.

Additionally, buyers need to notice that suppliers perceive their maturity more positive than buyers rank themselves. This implies that improving a little in the eyes of the buyer can have a larger effect on the maturity perception of the suppliers. However, this needs to be further researched before valid conclusions can be drawn.

Finally as a side step of this research, an extra analysis is conducted for the case company. More existing questions are asked to suppliers and also the scores of these factors are analysed. The

questionnaire send to suppliers was more extensive than only the constructs used for this research. The additional topics are among others preferred customer status, preferential treatment and development and are composed with previous tested questions. By special request of the case company the results of all constructs are split into four supplier groups; strategic, bottleneck, leverage and noncritical suppliers (according to the Kraljic division[307]). An analysis is conducted to see if these groups of suppliers have different opinions from each other. In the end 8 of the extra constructs are found to have significant different scores in means between groups (by use of ANOVA analysis). The constructs having a significant difference between groups are preferred customer status, preferential treatment, preferential resource allocation (physic and innovation), development, atmosphere, transfer of knowledge and intention to get more involved in NPD processes. None of the factors which are explicit treated in this research have significant different means. The case company found it very useful to know how the different supplier groups scored as they apply for example a more intensive approach to strategic suppliers who supply mostly core processes. Further research can take into account this division of suppliers as well, as the different kinds of suppliers require a different approach. Additionally, the constructs explicit treated in this research might have different means in other organisations.

[307] See Kraljic (1983), p.112.

11. Limitations and suggestions for further research

11.1 Limitations

This research also knows a few limitations. This paragraph will outline these limitations in order of the research. At first, limitations from the survey are described, followed by the limitations of the interviews and ultimately the limitations of the comparisons are discussed.

The most important limitation of this research was the small respondent group for the survey. Only 79 out of 118 suppliers completed the questionnaire, which is a high response rate but low in absolute cases. The case company is small; therefore not a large group of suppliers could be approached. Moreover, this case study only used one case company which is a limitation as well. Therefore this research should be replicated in different industries and in organisations which have a larger population group to see if the research model still holds. As already mentioned before, financial service organisations are subjected to many regulations from the government. Hence, they are comparable with governmental organisations. So, a first suggestion would be to replicate this study in a governmental organisation as it shows many similarities to financial service organisations.

The limitations of the interviews and completion of the maturity model come in the form of little adjustments in the old maturity model. As the current maturity model of Schiele (2007) is adjusted to make it more suitable for service organisations, these adjustments seem not enough. Purchasing in the case company has a mandatory advisory function and no budget. Therefore, it could be questioned if the maturity model is applicable for such purchasing departments since it might be possible that the maximum level cannot be obtained because of their organisational choice. Due to time limitations, heads of other relevant departments as in the research of Schiele (2007)[308] are not interrogated because contract managers are interviewed. So, further research could take these persons into account as well to get a more balanced view of the maturity of purchasing.

The comparison of the results from the survey and maturity model also knows limitations. The comparison did not include a full match of buyer and supplier questions of maturity. Therefore results of this comparison could not be generalised. In existing measures, small adjustments are made because the existing measures are already proved in previous research. [309] Also, due to time limitations there has been decided not to compose two complete new questionnaires.

[308] See Schiele (2007), p.278.
[309] See Schiele (2007); Hüttinger/Schiele/Schroër (2014) as well as Vos/Schiele/Hüttinger (2016).

11.2 Suggestions for further research

This paper concludes with some suggestions for further research. Relational factors are investigated to their impact on maturity perception. To the best of our knowledge, this research is the first in identifying antecedents in perceiving maturity of a buyer. Therefore a suggestion for further research is to do more research on what factors influence maturity perception and also to factors that negatively influence maturity perception. In this research, data is collected in a service organisation; it could be the case that in product organisation complete different factors are of importance in maturity perception but this needs further research

As this research is conducted in only one case company which was also relatively small, this research should be replicated in different industries and varied sizes of organisation. In that case, it could be seen if the factors influencing maturity perception remain. Furthermore, research could be executed in different industries and different organisational sizes to see if there exists a difference in perception as well.

The difference in perception should also be further investigated. The measurement instruments of this research are not fully aligned to each other so no hard conclusions could be drawn. As it seems that suppliers perceive maturity of purchasing more positive than buyers do, the effects and reasons behind this should be investigated. First step is to make questionnaires which are more aligned to each other. The questions need to be more of the same wording and not only needs the topic to be covered as it was in this research.

Lastly, there are not that much theoretical contributions to the adjusted maturity model in this research except for the addition of a sub dimension contract management. As Schiele (2007) already stated, further research needs to be done to maturity models in service organisations as they may require a different set of criteria.[310] Also the same level of maturity for different organisations is questioned by several authors. [311] Three points in further research to maturity models are proposed. At first, an investigation to the influence of size of the organisation on maturity level could be proposed. Second, another starting point can be the identification of what the desired maturity level of an organisation is and whether it wants to reach the highest stage in each dimension. Lastly, further research could investigate how to influence the maturity perception of the suppliers.

[310] See Schiele (2007), p.283.
[311] See Schiele (2007), p.283 as well as Úbeda/Alsua/Carrasco (2015), p.179.

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A. Appendix A Questions used in final quantitative model

Table 14 Questions used for revised model in Smart PLS 3.0

	Contact accessibility (Source: Vos et al. 2016)
ContactAcc1	There is a contact person within X who coordinates the relevant relationship activities within and outside X.
ContactAcc2	There is a contact person within X who is, for our employees, the one to contact in case of partner-specific questions.
ContactAcc3	There is a contact person within X who informs employees within X about the needs of our firm.
	Innovation potential (Source: Vos et al. 2016)
InnovationPot1*	In collaboration with X, our firm developed a very high number of new products and/or services.
InnovationPot2*	In collaboration with X, our firm was able to release a very high number of new products and/or services.
InnovationPot3	The speed of developing and releasing new products and/or services with X is very high.
InnovationPot4	X is able to respond quickly to (technological) developments in the market.
InnovationPot5	X is able to anticipate to competitors' (technological) developments.
	Reliability (Source: Vos et al. 2016)
Reliability1	In collaboration with our firm, X provided a completely truthful picture during negotiating.
Reliability2	In collaboration with our firm, X always negotiated from a faith bargaining perspective.
Reliability3	In collaboration with our firm, X never breached formal or informal agreements to benefit themselves.
Reliability4	In collaboration with our firm, X never altered facts in order to meet its own goals and objectives.
	Involvement (Source: Vos et al. 2016)
Involvement1	We are early involved in the new product and/or service development process of X.
Involvement2	We are very active in the new product and/or service development process of X.
Involvement3*	We would like to get more involved in the development process of new products and/or services of X. (Added)
Involvement4*	We are open minded to collaborate with X to develop new products and/or services. (Added)
Involvement5	The communication between our firms about quality considerations and design changes of products and/or services is very close.
	Maturity perception
Maturity perception part: Operative excellence (Source: Vos et al. 2016)	
OperativeEx1*	X has always exact and in time forecasts about future demand.
OperativeEx2*	X provides us with forecasts our firm can rely and plan on.
OperativeEx3	X has for our firm simple and transparent internal processes.
OperativeEx4	X supports short-decision-making processes.
OperativeEx5*	X is open minded towards process optimizations.
OperativeEx6	X acts professional. (Added)
OperativeEx7*	X has an optimal payment habit.
Maturity perception part: Maturity (Added)	
Maturity1	X leaves a professional impression
Maturity2	X has all information prepared regarding our relation.
Maturity3	X is clear and consistent in its communication.
Maturity4	X takes care of attending employees during negotiations which have know-how.
Maturity5	X suggests to have everything proper arranged in their organisation.

Continuation Table 14 Questions used for revised model in Smart PLS 3.0

Supplier satisfaction (Source: Vos et al. 2016)	
SupplierSat1	Our firm is very satisfied with the overall relationship with X.
SupplierSat2	Generally, our firm is very pleased to have X as our business partner.
SupplierSat3	If we had to do it all over again, we would still choose X as customer.
SupplierSat4*	Our firm does not regret the decision to do business with X.
SupplierSat5	Our firm is very satisfied with the value we obtain from the relationship with X.

Note: * questions are removed after analysis in Smart PLS 3.0

B. Appendix B Replication of the model of Vos et al. (2016)

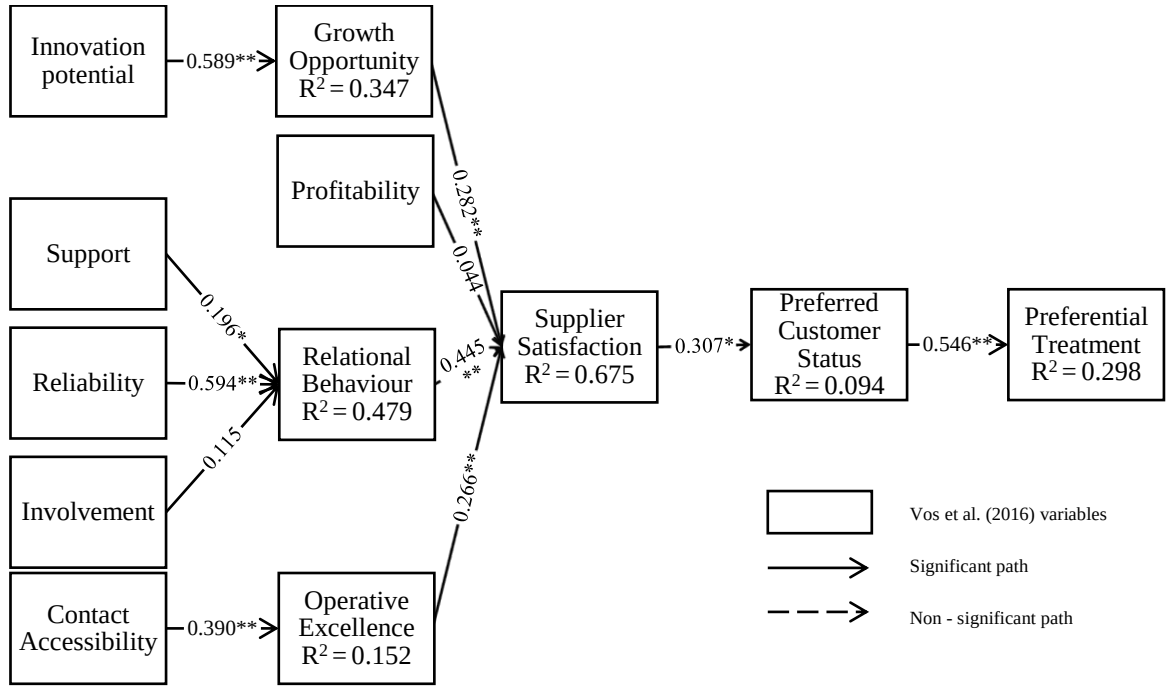

Figure 16 Replication of research model of Vos et al. (2016)

Table 15 Quality criteria replication of research model of Vos et al. (2016)

	AVE	*√AVE*	*CR*	*Cronbach's alpha*	R^2	*Inner VIF*
Contact accessibility	0,780	0,883	0,914	0,858		1,000
Growth opportunity	0,504	0,710	0,753	0,524	0,347	1,536
Innovation potential	0,785	0,886	0,916	0,863		1,000
Reliability	0,735	0,857	0,917	0,878		1,031
Support	0,817	0,904	0,899	0,783		1,242
Involvement	0,718	0,847	0,884	0,803		1,241
Relational behaviour	0,646	0,804	0,901	0,862	0,479	1,843
Profitability	0,663	0,814	0,886	0,826		1,497
Operative excellence	0,658	0,811	0,852	0,738	0,152	1,866
Supplier satisfaction	0,692	0,832	0,900	0,851	0,675	1,000
Preferred customer status	0,635	0,797	0,874	0,809	0,094	1,000
Preferential treatment	0,811	0,901	0,896	0,767	0,298	-

Note: AVE = Average variance extracted, CR = Composite reliability, √AVE = value for assessing the Fornell and Larcker (1981) statistic of discriminant validity (Criterion is √AVE > r,), VIF = Variance inflation factor

Table 16 Overview HTMT-ratio/correlations replication research model of Vos et al. (2016)

	Contact accessibility	*Growth opportunity*	*Innovation potential*	*Involvement*	*Operative excellence*	*Preferential treatment*	*Preferred customer status*	*Profitability*	*Relational behaviour*	*Reliability*	*Supplier satisfaction*	*Support*
Contact accessibility		0,152	0,048	0,060	0,390	-0,151	0,026	0,254	0,253	0,122	0,345	0,116
Growth opportunity	0,270		0,589	0,555	0,405	0,154	0,248	0,526	0,312	0,111	0,551	0,409
Innovation potential	0,115	0,807		0,599	0,349	0,157	0,246	0,394	0,172	-0,070	0,257	0,367
Involvement	0,177	0,793	0,716		0,392	0,137	0,193	0,392	0,287	0,146	0,402	0,433
Operative excellence	0,479	0,647	0,423	0,519		-0,132	0,057	0,286	0,644	0,535	0,679	0,274
Preferential treatment	0,189	0,254	0,189	0,178	0,184		0,546	0,190	0,090	0,142	0,220	0,065
Preferred customer status	0,168	0,356	0,282	0,245	0,229	0,689		0,116	0,149	0,188	0,307	0,256
Profitability	0,296	0,784	0,458	0,479	0,361	0,243	0,242		0,379	0,108	0,437	0,231
Relational behaviour	0,288	0,471	0,250	0,339	0,796	0,110	0,212	0,464		0,640	0,721	0,334
Reliability	0,184	0,172	0,247	0,173	0,664	0,172	0,222	0,145	0,727		0,583	0,149
Supplier satisfaction	0,387	0,812	0,286	0,483	0,835	0,283	0,365	0,518	0,831	0,665		0,377
Support	0,172	0,623	0,449	0,539	0,368	0,075	0,319	0,281	0,392	0,170	0,448	

Note: Left corner HTMT ratio, right corner correlations

Table 17 Bootstrap and effect statistics of replication of the research model of Vos et al. (2016) (bootstrap samples = 5000)

Paths	*β*	*SE*	*t*	f^2
IP → GO	0,589**	0,072	8,156	0,531
GO → SS	0,282**	0,080	3,525	0,159
P → SS	0,044	0,079	0,555	0,004
S → RB	0,196*	0,094	2,080	0,060
R → RB	0,594**	0,076	7,867	0,658
I → RB	0,115	0,089	1,293	0,021
RB → SS	0,445**	0,086	5,198	0,331
CA → OE	0,390**	0,096	4,054	0,180
OE → SS	0,266**	0,087	3,051	0,116
SS → PC	0,307*	0,099	3,103	0,104
PC → PT	0,546**	0,075	7,263	0,425

Note: β =standardised coefficient, SE = standard error of β, t= t-statistic, SE standard error of beta, f^2= effect size of variance explained by predictor, * = p < .05 (one-sided), ** = p < .01 (one-sided), CA = Contact accessibility, GO = Growth potential, IP = Innovation potential, R = Reliability, S = Support, I = Involvement, RB = Relational behaviour, P = Profitability, OE = Operative Excellence, SS = Supplier satisfaction, PC = Preferred customer status, PT = Preferential treatment

Important factors for maturity perception

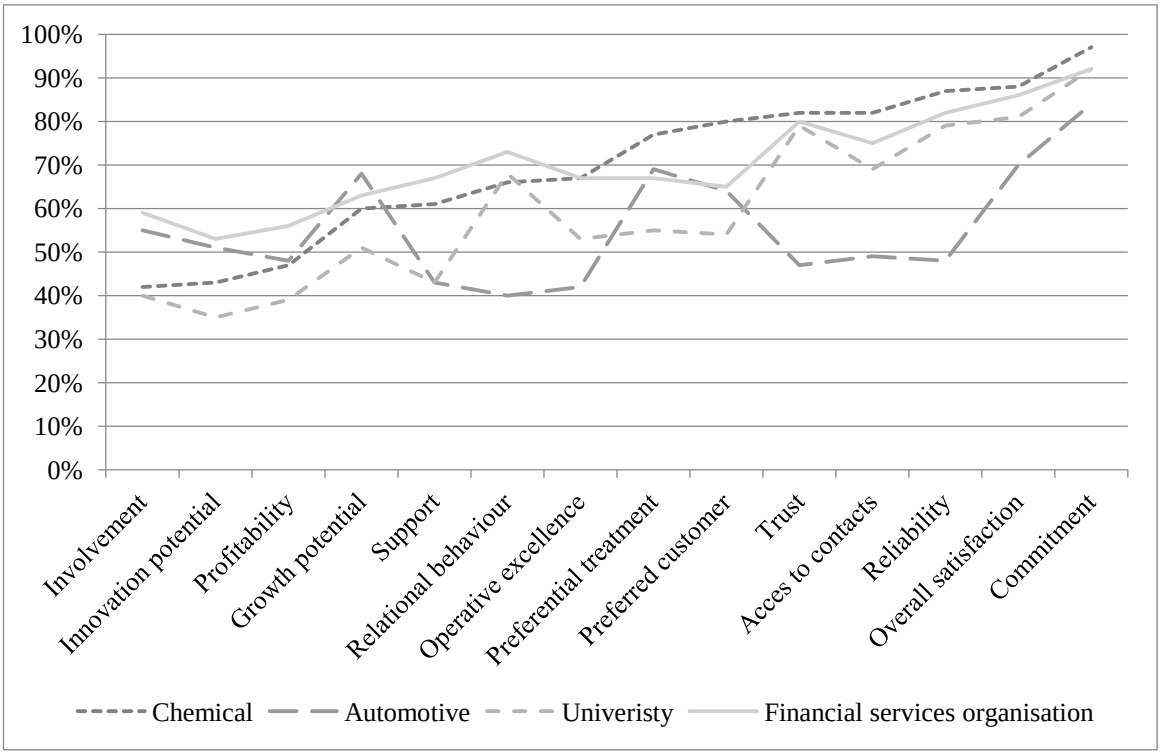

Figure 17 Industry comparison

Note: Data for the chemical, automotive and university industries are retrieved from the research of respectively Vos et al. (2016), Hüttinger et al. (2014) and Praas (2016) and van der Lelij (2016). Scores for financial service organisation are based on data from this research. All original questions of Vos et al. (2016) are used to compute scores of the financial service organisation.

C. Appendix C Testing economic factors as control variables

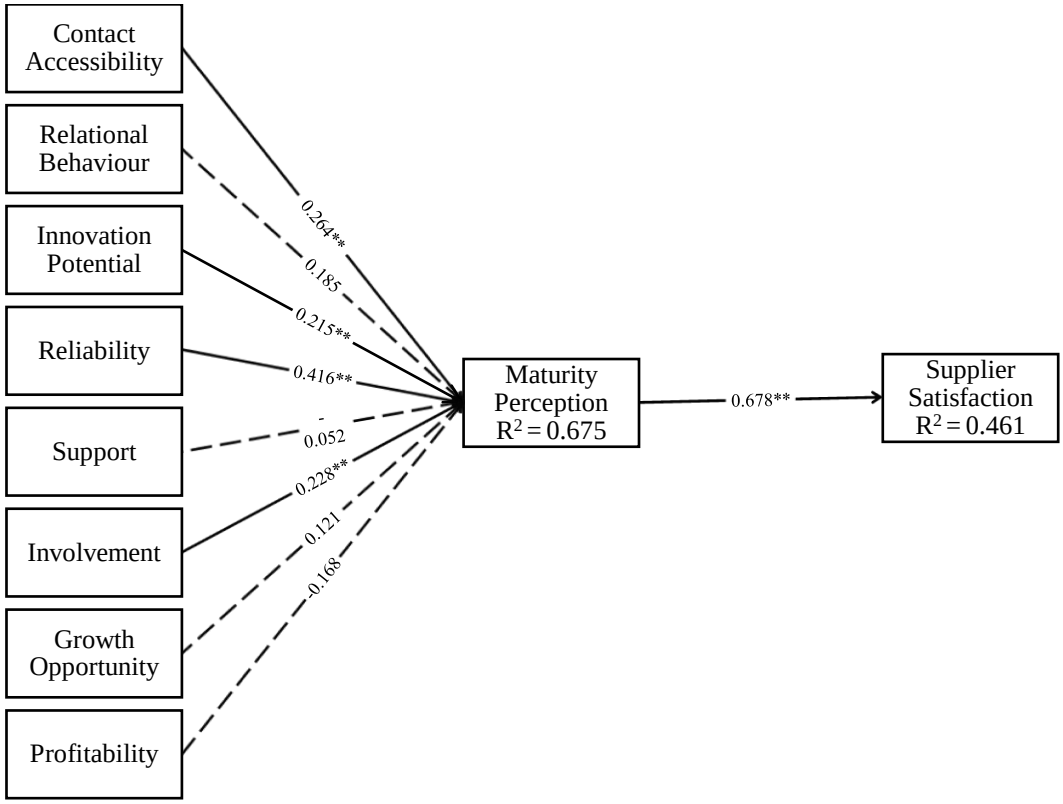

Figure 18 Results of first quantitative research model with control variables in Smart PLS 3.0

Table 18 Quality criteria of first model with control variables

	AVE	*√AVE*	*CR*	*Cronbach's alpha*	R^2	*Inner VIF*
Contact accessibility	0,778	0,882	0,913	0,858		1,115
Relational behaviour	0,644	0,802	0,900	0,862		2,242
Innovation potential	0,680	0,825	0,864	0,766		1,903
Reliability	0,734	0,857	0,917	0,878		1,804
Support	0,820	0,906	0,901	0,783		1,374
Involvement	0,715	0,846	0,883	0,803		1,646
Growth Opportunity	0,695	0,834	0,818	0,583		1,473
Profitability	0,657	0,811	0,884	0,826		1,551
Maturity perception	0,625	0,791	0,930	0,914	0,675	1,000
Supplier satisfaction	0,690	0,831	0,898	0,851	0,461	-

Note: AVE = Average variance extracted, CR = Composite reliability, √AVE = value for assessing the Fornell and Larcker (1981) statistic of discriminant validity (Criterion is √AVE > r,), VIF = Variance inflation factor

Table 19 HTMT-ratios and correlations first model with control variables

	Contact accessibility	*Relational Behaviour*	*Innovation potential*	*Reliability*	*Support*	*Involvement*	*Growth opportunity*	*Profitability*	*Maturity Perception*	*Supplier Satisfaction*
Contact accessibility		0,260	0,181	0,133	0,120	0,094	0,147	0,260	0,396	0,365
Relational Behaviour	0,288		0,342	0,641	0,333	0,285	0,296	0,383	0,613	0,725
Innovation potential	0,218	0,421		0,216	0,387	0,568	0,493	0,469	0,506	0,430
Reliability	0,184	0,727	0,253		0,145	0,147	0,080	0,121	0,631	0,587
Support	0,172	0,392	0,498	0,170		0,430	0,342	0,233	0,285	0,374
Involvement	0,177	0,339	0,720	0,173	0,539		0,344	0,387	0,443	0,408
Growth opportunity	0,232	0,403	0,706	0,133	0,485	0,463		0,416	0,344	0,454
Profitability	0,296	0,464	0,571	0,145	0,281	0,479	0,599		0,249	0,437
Maturity Perception	0,442	0,676	0,594	0,695	0,330	0,507	0,447	0,272		0,679
Supplier Satisfaction	0,387	0,831	0,506	0,665	0,448	0,483	0,644	0,518	0,739	

Note: Left corner HTMT ratio, right corner correlations

Table 20 Bootstrap and effect statistics of the first quantitative model with control variables (bootstrap samples = 5000)

Paths	*β*	*SE*	*t*	f^2
CA → MP	0,264**	0,095	2,785	0,193
GO → MP	0,121	0,079	1,527	0,030
IP → MP	0,215**	0,080	2,673	0,075
R → MP	0,416**	0,109	3.820	0,295
S → MP	-0,052	0,075	0,696	0,006
I → MP	0,228**	0,074	3.068	0,097
RB → MP	0,185	0,119	1,560	0,047
P → MP	-0,168	0,101	1,652	0,056
MP → SS	0,679**	0,050	13,489	0,854

Note: β =standardised coefficient, SE = standard error of β, t= t-statistic, SE standard error of beta, f^2= effect size of variance explained by predictor, * = p < .05 (one-sided), ** = p < .01 (one-sided), CA = Contact accessibility, GO = Growth Opportunity, IP = Innovation potential, R = Reliability, S = Support, I = Involvement, RB = Relational behaviour, P = Profitability, MP = Maturity perception, SS = Supplier satisfaction

D. Appendix D Cross loadings first model

Table 21 Cross loadings first quantitative model

	Contact accessibility	*Innovation potential*	*Involvement*	*Maturity Perception*	*Relational Behaviour*	*Reliability*	*Supplier Satisfaction*	*Support*
SS001_SQ0011	0,915	0,194	0,107	0,382	0,252	0,152	0,346	0,131
SS001_SQ0012	0,879	0,135	0,058	0,276	0,095	0,004	0,177	0,078
SS001_SQ0013	0,851	0,143	0,076	0,370	0,306	0,167	0,404	0,101
SS003_SQ0033	0,158	0,788	0,560	0,425	0,296	0,143	0,398	0,399
SS003_SQ0034	0,159	0,883	0,440	0,476	0,292	0,214	0,363	0,248
SS003_SQ0035	0,127	0,800	0,399	0,328	0,255	0,174	0,290	0,323
SS004_SQ0043	0,280	0,404	0,416	0,735	0,441	0,448	0,540	0,175
SS004_SQ0044	0,292	0,387	0,244	0,792	0,538	0,488	0,556	0,228
SS004_SQ0046	0,285	0,320	0,313	0,724	0,509	0,559	0,553	0,136
SS005_SQ0051	0,233	0,404	0,336	0,804	0,624	0,521	0,655	0,256
SS005_SQ0052	0,212	0,519	0,496	0,814	0,469	0,510	0,508	0,360
SS005_SQ0053	0,435	0,442	0,423	0,866	0,416	0,450	0,498	0,303
SS005_SQ0054	0,363	0,314	0,241	0,767	0,444	0,598	0,526	0,149
SS005_SQ0055	0,418	0,405	0,323	0,812	0,415	0,400	0,431	0,178
SS006_SQ0061	0,266	0,288	0,145	0,585	0,540	0,769	0,461	0,065
SS006_SQ0062	0,153	0,199	0,099	0,571	0,625	0,889	0,550	0,158
SS006_SQ0063	0,012	0,133	0,170	0,517	0,516	0,887	0,538	0,160
SS006_SQ0064	-0,012	0,092	0,081	0,467	0,494	0,875	0,447	0,117
SS007_SQ0071	0,178	0,300	0,363	0,222	0,243	0,091	0,278	0,880
SS007_SQ0072	0,056	0,391	0,411	0,286	0,348	0,164	0,388	0,930
SS009_SQ0091	-0,047	0,445	0,845	0,326	0,287	0,150	0,349	0,394
SS009_SQ0092	-0,013	0,537	0,855	0,350	0,228	0,101	0,294	0,352
SS009_SQ0095	0,250	0,461	0,837	0,430	0,218	0,123	0,383	0,348
SS011_SQ0111	0,134	0,169	0,182	0,466	0,812	0,573	0,487	0,265
SS011_SQ0112	0,290	0,221	0,236	0,504	0,863	0,581	0,645	0,299
SS011_SQ0113	0,214	0,370	0,182	0,380	0,727	0,431	0,549	0,267
SS011_SQ0116	0,212	0,273	0,225	0,471	0,791	0,455	0,578	0,163
SS011_SQ0117	0,196	0,347	0,296	0,601	0,814	0,522	0,634	0,327
SS013_SQ0131	0,365	0,466	0,408	0,661	0,669	0,527	0,862	0,353
SS013_SQ0132	0,276	0,379	0,375	0,623	0,631	0,532	0,904	0,298
SS013_SQ0133	0,096	0,242	0,283	0,346	0,488	0,374	0,716	0,277
SS013_SQ0135	0,405	0,294	0,270	0,553	0,593	0,488	0,829	0,313

Note: items above 0.5 are highlighted; green is highest loading for item

E. Appendix E Comparison matrix supplier satisfaction survey and maturity model

Table 22 Comparison matrix Innovation

Innovation										
Question number	Part	Question	Score according to supplier satisfaction survey (1-5 scale)	Question number	Part	Question	Score according to maturity profile (1-20 scale)	Translated score to 1 - 5 scale	Difference supplier satisfaction -maturity profile	Difference in % ((survey-profile) / profile)
SQ0033	Innovation potential	The speed of developing and releasing new products and/or services with X is very high		PL4	Innovation planning/ Technology identification	How do you keep track of technology trends? Is there a formal process of technology monitoring?				
SQ0034	Innovation potential	X is able to respond quickly to (technological) developments in the market		PL4	Innovation planning/Inno-vation process	How is purchasing's integration into new product or service development processes ensured? How does purchasing support early supplier integration?				
SQ0035	Innovation potential	X is able to anticipate to competitors' (technological) developments		PL4	Innovation planning/ Technology roadmaps	Do purchasers know the technology roadmap of your company and your suppliers? Is there a methodology of correlating your technology roadmaps with those of your suppliers?				
Total				Total						

Table 23 Comparison matrix Operative excellence

Operational excellence										
Question number	Part	Question	Score according to supplier satisfaction survey (1-5 scale)	Question number	Part	Question	Score according to maturity profile (1-20 scale)	Translated score to 1 - 5 scale	Difference supplier satisfaction -maturity profile	Difference in % ((survey-profile)/profile)
SQ0043	Operational excellence	X has for our firm simple and transparent internal processes		PO3	Supplier evaluation/ Responsibility	Do you have a supplier management function in your organisation?				
SQ0052	Maturity	X has all information prepared regarding our relation		PO6	Purchasing early involvement in development process/ Standardisa-tion	Does purchasing pursue consequently measures to reduce complexity of products, services, processes and sourcing procedures?				
				PO8	Contract management/ Contract administration	Is there an actively managed contract administration?				
Total				Total						

Table 24 Comparison matrix Relation management

Relation management										
Question number	Part	Question	Score according to supplier satisfaction survey (1-5 scale)	Question number	Part	Question	Score according to maturity profile (1-20 scale)	Translated score to 1 - 5 scale	Difference supplier satisfaction -maturity profile	Difference in % ((survey-profile)/profile)
SQ0011	Contact accessibility	There is a contact person within X who coordinates the relevant relationship activities within and outside X		PO8	Contract management/ Relation management	Is there an intensive effort to manage relations with suppliers?				
SQ0012	Contact accessibility	There is a contact person within X who is, for our employees, the one to contact in cause of partner-specific questions								
SQ0013	Contact accessibility	There is a contact person within X who informs employees within X about the needs of our firm								
SQ0053	Maturity	X is clear and consistent in its communication								
Total				Total						

Table 25 Comparison matrix Negotiation

Negotiation										
Question number	Part	Question	Score according to supplier satisfaction survey (1-5 scale)	Question number	Part	Question	Score according to maturity profile (1-20 scale)	Translated score to 1-5 scale	Difference supplier satisfaction -maturity profile	Difference in % ((survey-profile)/profile)
SQ0044	Operational excellence	X supports short decision making processes		PO2	Negotiation process/ Negotiation preparation	If preparing a negotiation, do you follow a uniform and systematic approach? Are decision criteria, tactics and targets agreed cross-functionally?				
SQ0054	Maturity	X takes care of attending employees during negotiations which have know-how		PO2	Negotiation process/ Process	How is the negotiation process being planned?				
SQ0061	Reliability	In collaboration with our firm, X provided a completely truthful picture during negotiating		HR1	Job descriptions and competencies	Is there technical competence available in purchasing? Are designated competences available e.g. advanced sourcing engineer?				
SQ0062	Reliability	In collaboration with our firm, X always negotiated from a faith bargaining perspective								
SQ0063	Reliability	In collaboration with our firm, X never breached formal or informal agreements to benefit themselves								
SQ0064	Reliability	In collaboration with our firm, X never altered facts in order to meet its own goals and objectives								
Total				Total						

Table 26 Comparison matrix Early supplier involvement

Early supplier involvement										
Question number	Part	Question	Score according to supplier satisfaction survey (1-5 scale)	Question number	Part	Question	Score according to maturity profile (1-20 scale)	Translated score to 1-5 scale	Difference supplier satisfaction -maturity profile	Difference in % ((survey-profile)/profile)
SQ0091	Involvement	We are early involved in the new product and/or service development process of X		PO7	Early supplier involvement process/Early supplier involvement	To what extend are suppliers incorporated into the phases of product development?				
SQ0092	Involvement	We are very active in the new product and/or service development process of X		PO7	Early supplier involvement process/ technology roadmaps	For which suppliers do you have their technology roadmaps accessible?				
SQ0095	Involvement	The communication between our firms about quality considerations and design changes of products and/or services is very close								
Total				Total						

Table 27 Comparison matrix General maturity/satisfaction

General maturity/satisfaction										
Question number	Part	Question	Score according to supplier satisfaction survey (1-5 scale)	Question number	Part	Question	Score according to maturity profile (1-20 scale)	Translated score to 1-5 scale	Difference supplier satisfaction -maturity profile	Difference in % ((survey-profile)/profile)
SQ0046	Operational excellence	X acts professional		n/a	n/a	FINAL MATURITY SCORE				
SQ0051	Maturity	X leaves a professional impression								
SQ0055	Maturity	X suggests to have everything proper arranged in their organisation								
SQ00131	Supplier Satisfaction	Our firm is very satisfied with the overall relationship with X								
SQ00132	Supplier Satisfaction	Generally, our firm is very pleased to have X as our business partner								
SQ00133	Supplier Satisfaction	If we had to do it all over again, we would still choose X as customer								
SQ00135	Supplier Satisfaction	Our firm is satisfied with the value we obtain from the relationship with X								
Total				Total						

Table 28 Comparison matrix Final score

FINAL grade										
Question number	Part	Question	Score according to supplier satisfaction survey (1-5 scale)	Question number	Part	Question	Score according to maturity profile (1-20 scale)	Translated score to 1-5 scale	Difference supplier satisfaction -maturity profile	Difference in % ((survey-profile)/profile)
SQ04131	Final grade	When I may grade the relationship with X, I would grade a		n/a	n/a	FINAL MATURITY SCORE				

F. Appendix F Cross loadings revised model

Table 29 Cross loadings revised model

Cross loadings

	Contact accessibility	*Innovation potential*	*Involvement*	*Maturity perception*	*Reliability*	*Supplier satisfaction*
SS001_SQ0011	0,915	0,194	0,107	0,382	0,152	0,346
SS001_SQ0012	0,879	0,135	0,058	0,276	0,004	0,177
SS001_SQ0013	0,851	0,143	0,076	0,370	0,167	0,404
SS003_SQ0033	0,158	0,788	0,560	0,425	0,143	0,398
SS003_SQ0034	0,159	0,883	0,440	0,476	0,214	0,363
SS003_SQ0035	0,127	0,800	0,399	0,328	0,174	0,290
SS004_SQ0043	0,280	0,404	0,416	0,735	0,448	0,540
SS004_SQ0044	0,292	0,387	0,245	0,791	0,488	0,556
SS004_SQ0046	0,285	0,320	0,313	0,723	0,559	0,553
SS005_SQ0051	0,233	0,404	0,336	0,802	0,521	0,655
SS005_SQ0052	0,212	0,519	0,497	0,815	0,510	0,509
SS005_SQ0053	0,435	0,442	0,423	0,867	0,450	0,498
SS005_SQ0054	0,363	0,314	0,241	0,768	0,598	0,526
SS005_SQ0055	0,418	0,405	0,323	0,813	0,400	0,431
SS006_SQ0061	0,266	0,288	0,145	0,585	0,769	0,461
SS006_SQ0062	0,153	0,199	0,099	0,571	0,889	0,550
SS006_SQ0063	0,012	0,133	0,170	0,517	0,887	0,538
SS006_SQ0064	-0,012	0,092	0,081	0,467	0,875	0,447
SS009_SQ0091	-0,047	0,445	0,845	0,326	0,150	0,349
SS009_SQ0092	-0,013	0,537	0,854	0,350	0,101	0,294
SS009_SQ0095	0,250	0,461	0,837	0,431	0,123	0,383
SS013_SQ0131	0,365	0,466	0,408	0,661	0,527	0,862
SS013_SQ0132	0,276	0,379	0,375	0,621	0,532	0,904
SS013_SQ0133	0,096	0,242	0,283	0,345	0,374	0,716
SS013_SQ0135	0,405	0,294	0,270	0,552	0,488	0,829

Note: items above 0.5 are highlighted, green is highest loading for item

G. Appendix G Factor analysis

Table 30 KMO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,833
Bartlett's Test of Sphericity	Approx. Chi-Square	1336,461
	df	300
	Sig.	,000

Table 31 Rotated Component Matrix Varimax Rotation

Rotated Component Matrix[a]

	Component					
	1	*2*	*3*	*4*	*5*	*6*
SS001_SQ0011				**,855**		
SS001_SQ0012				**,875**		
SS001_SQ0013				**,813**		
SS003_SQ0033			**,458**			,416
SS003_SQ0034						**,784**
SS003_SQ0035						**,860**
SS004_SQ0043	**,566**					
SS004_SQ0044	**,761**					
SS004_SQ0046	**,636**				,406	
SS005_SQ0051	**,704**				,420	
SS005_SQ0052	**,646**		,414			
SS005_SQ0053	**,712**					
SS005_SQ0054	**,635**					
SS005_SQ0055	**,764**					
SS006_SQ0061	**,496**	,410				
SS006_SQ0062		**,745**				
SS006_SQ0063		**,820**				
SS006_SQ0064		**,916**				
SS009_SQ0091			**,825**			
SS009_SQ0092			**,753**			
SS009_SQ0095			**,741**			
SS013_SQ0131					**,489**	
SS013_SQ0132					**,769**	
SS013_SQ0133					**,788**	
SS013_SQ0135					**,622**	

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 8 iterations.
Note: loadings below 0.4 are suppressed, bold loadings are the highest loading of a construct

Table 32 Pattern Matrix Oblimin Rotation

Pattern Matrix[a]

	Component					
	1	*2*	*3*	*4*	*5*	*6*
SS001_SQ0011			**,875**			
SS001_SQ0012			**,901**			
SS001_SQ0013			**,845**			
SS003_SQ0033						
SS003_SQ0034					**,818**	
SS003_SQ0035					**,934**	
SS004_SQ0043	**,494**					
SS004_SQ0044	**,823**					
SS004_SQ0046	**,657**					
SS005_SQ0051	**,746**					
SS005_SQ0052	**,539**					
SS005_SQ0053	**,609**					
SS005_SQ0054	**,535**					
SS005_SQ0055	**,743**					
SS006_SQ0061						
SS006_SQ0062						**,741**
SS006_SQ0063						**,847**
SS006_SQ0064						**,980**
SS009_SQ0091		**,822**				
SS009_SQ0092		**,696**				
SS009_SQ0095		**,740**				
SS013_SQ0131						
SS013_SQ0132				**,695**		
SS013_SQ0133				**,786**		
SS013_SQ0135				**,549**		

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 11 iterations.
Note: Loadings below 0.4 are suppressed