Lappeenranta University of Technology
School of Business and Management
Business Administration
Double Degree in Supply Management

University of Twente
Behavioral, Management and Social Sciences
Business Administration
Double Degree in Purchasing & Supply Management

Master's Thesis

Towards performance-based contracting in service triads

2018

Riikka Raukola S2021633

1st supervisor: Veli Matti Virolainen

2nd supervisor: Holger Schiele

Abstract

Author:	Riikka Raukola
Title:	Towards performance-based contracting in service triads
Year:	2018
Faculty:	Behavioral, Management and Social Sciences
Major:	Purchasing & Supply Management, Double Degree with Lappeenranta University of Technology
Master's Thesis:	120 pages, 9 figures, 11 tables and 1 appendix
Examiners:	Professor Veli Matti Virolainen (Lappeenranta University of Technology) Doctor Professor Holger Schiele (University of Twente) Associate Professor Joona Keränen (Lappeenranta University of Technology)
Key words:	Performance-based contracting, pay for performance, supplier management, service triads, forest industry

This thesis focuses on identifying actor perceptions, expectations, barriers and goals of performance-based contracting, thus aiming to answer how performance-based contracting can be effectively introduced in service triads. The study contributes to operations and supply management literature by illuminating how transition from product-based contracting to performance-based contracting (PBC) is seen from different actors' perspectives in a service triad. The triad consists of a purchasing department, mills and suppliers, all operating in forest industry.

The study is conducted as qualitative case study that employs an abductive approach. The primary data consists of 25 theme-based individual interviews. The interviews cover all the actors of the triad, namely seven interviews from purchasing department, 11 from eight different mills and seven from three different suppliers.

The findings show that the buyer is not a coherent unit, but has conflicting interests. Though the actors possess a variety of perceptions and expectations towards performance-based contracting, most of them are interested in the transition at the level of thought, but do not know how it could be done in practice. Findings also show that it is easier to identify barriers, change resistance, conflicting interests, difficulties in designing the compensation system and fear of increased workload just to name a few, than goals and especially purchasing department believes in the potential of PBC.

Tiivistelmä

Tekijä:	Riikka Raukola
Tutkielman nimi:	Kohti suoritusperusteisia sopimuksia triadisissa palveluissa
Vuosi:	2018
Tiedekunta:	Kauppakorkeakoulu
Pääaine:	Hankintojen johtaminen, kaksoistutkinto Lappeenrannan teknillisen yliopiston kanssa
Pro gradu -tutkielma:	120 sivua, 9 kuviota, 11 taulukkoa and 1 liite
Tarkastajat:	Professori Veli Matti Virolainen (Lappeenrannan teknillinen yliopisto) Doctor Professor Holger Schiele (Twenten yliopisto) Tutkijaopettaja Joona Keränen (Lappeenrannan teknillinen yliopisto)
Avainsanat:	Suoritusperusteiset sopimukset, toimittajan johtaminen, triadinen palvelu, metsäteollisuus

Tutkimus keskittyy aktoreiden mielikuviin, odotuksiin, esteisiin ja tavoitteisiin suoritusperusteisista sopimuksista, ja pyrkii niiden avulla vastaamaan kysymykseen, miten suoritusperusteisia sopimuksia voitaisiin ottaa käyttöön. Tämän tutkimuksen tavoitteena on edistää hankintojen johtamisen kirjallisuutta tutkimalla, miten siirtyminen tuoteperusteisista sopimuksista kohti suoritusperusteisia sopimuksia nähdään triadisesta näkökulmasta. Tutkimuksen triadi koostuu yrityksen ostosta, tehtaista ja toimittajista, jotka kaikki toimivat metsäteollisuudessa.

Tutkielma on tehty kvalitatiivisena tapaustutkimuksena, jossa on hyödynnetty abduktiivista lähestymistapaa. Tutkimusdata koostuu 25 yksilöhaastattelusta, jotka toteutettiin teemahaastatteluina. Jokaisesta triadin aktorista haastateltiin ihmisiä siten, että ostolta haastateltiin seitsemää henkilöä, kahdeksalta tehtaalta 11 henkilöä ja kolmelta toimittajalta seitsemää henkilöä.

Tulokset osoittavat, että ostaja ei ole yhtenäinen yksikkö vaan voi pitää sisällään hyvinkin eriäviä intressejä. Vaikka haastateltavilla on laaja skaala mielikuvia ja odotuksia suoritusperusteisista sopimuksista, suurin osa on ajatuksen tasolla kiinnostunut siirtymisestä, mutta eivät osaa sanoa, miten asia käytännössä pitäisi tehdä. Tulokset osoittavat, että esteitä on helpompi tunnistaa, esimerkiksi muutosvastarinta, ristiriitaiset kiinnostuksen kohteet, kompensaatiomallin muodostamisen hankaluus sekä lisätyön pelko, kuin tavoitteita, ja erityisesti osto uskoo suoritusperusteisten sopimusten potentiaaliin.

Acknowledgements

I remember the first day of walking into Lappeenranta University of Technology. Little did I knew of the wonderful years that were ahead. Now, when finalizing my thesis I feel that the years have gone so fast and how much fun we had and how grateful I am for everything that has happened. The university has given me much more than just a degree; I have made friends with whom I wish to continue this journey for the rest of my life and most importantly, I have learned much from myself, how to be persistent, independent and how some things just are worth fighting for. Though I feel blue that one chapter has come to an end, I am certain that the next will be at least as good and rewarding as the chapters this far.

I want to thank both Lappeenranta University of Technology and University of Twente for making this double degree possible. I am deeply grateful especially to Joona Keränen who helped me to write the thesis and who had the patience to answer all my questions and worries. Additional thanks goes to the professors and teachers from both universities, as well as to the case companies who agreed to be part of my study. I really enjoyed the research project and hope that you feel the same way when reading this.

Special thanks goes to my family, friends and loved ones, who have supported me and believed in me. I could have not done this without you.

In the words of Albert Einstein: *I have no special talent. I am only passionately curious.*

In Helsinki, the 22nd of November 2018

Riikka Raukola

Table of Contents

List of Appendices

List of Tables

List of Figures

1. Introduction

1.1 The background of the study

Nowadays, (B2B) companies have concentrated more on understanding and implementing strategies based on generating value in a form of service rather than product (Terho et al. 2017), often to differentiate themselves from the competitors (Töytäri et al. 2015). Customers are no longer faithful to the best physical products, but require something more (Ng & Nudurupati 2010). As a result, services where the value is created together in a form of solutions and need fulfilment are preferred over physical products. Shift from product-focused business model to service-focused business model requires the organizations' operations to change, changing the selling and contracting functions among others towards performance-based rather than product-based business model. As a result, pay schemes related to performance have gained popularity, at least in the literature (Greiling 2006).

The performance-based business model can be seen as an umbrella topic which can be further narrowed down to sub-categories such as performance-based contracting and performance-based pricing. The literature lacks a consistent terminology, which means that the idea behind performance-based contracting needs to be well understood (Berkowitz et al. 2003; Hypko et al. 2010A), in order to combine different terms under one term. In this study, the chosen term is performance-based contracting. The literature has also acknowledged potential of contractual techniques, and especially contractual incentives (Guajardo et al. 2012), to affect the business is underestimated (Liinamaa et al. 2016) though only a few businesses use contracts as a part of long-term planning and incentivizing (Datta & Roy 2013). This new type of contracting, performance-based contracting turns the roles and goal of the cooperation upside down; the idea is to "first and foremost, the practice of thinking and working in terms of ends rather than means" (Straub 2009, 206). Theory of performance-based contracting also provides valuable managerial implications especially for companies that aim to implement performance-based contracting (Kim et al. 2007). Hensher and Stanly (2008, 1145) add to this "Although the *outcome* is relevant, so is the *process* leading to the outcome". The key literature of performance-based contracting is presented in Table 1.

Research on performance-based contracting has significantly increased starting from the beginning of the 21st century (Selviaridis & Wynstra 2015), and is believed to increase even more in the future (Glas & Kleemann 2017). From theoretical point of view, studies of performance-based contracting give insight to further benefit the knowledge of service science and it offers an example of service-dominant logic instead of goods or product-dominant logic (Ng et al. 2009). Performance-based contracting is especially used in government and non-profit sector activities (Gates et al. 2004; Randall et al. 2011), but also in private sector (Gruneberg et al. 2007). According to Selviaridis and Wynstra (2015), the sector where the performance-based contracting has been studied the most is clearly healthcare and social welfare services (Lindkvist 1996; Christianson et al. 2008; Brucker & Stewart 2011; Benzer et al. 2014; Selviaridis & Wynstra 2015), but also in industries such as defense (Doerr et al. 2005; Ng et al. 2009; Datta & Roy 2013; Caldwell & Howard 2014; Howard et al. 2016), facilities service/maintenance (Ng et al. 2013, Nullmeier et al. 2016), utilities and energy, construction (Gruneberg et al. 2007; Caldwell et al. 2009), manufacturing (Hypko et al. 2010A; Liinamaa et al. 2016; Visnjic et al. 2017), public administration (Caldwell et al. 2009), public transport (Hensher & Stanley 2008; Hooper 2008), higher education and logistics. As the industries show, performance-based contracting is increasingly popular in capital-intensive industries (Xiang et al. 2017).

Selviaridis and Wynstra (2015) also note that performance-based contracting should be further studied not just to elaborate servitization but to enrich the research on sustainable operations and supply management. According to Glas et al. (2011) and Kleemann et al. (2012) the current literature *lacks empirical evidence about performance-based contracting* and Wynstra et al. (2015) support developing and testing theories that enable better examining and understanding of triads. For example Liinamaa et al. (2016) identified a research gap on the barriers to performance-based selling and pricing and noted that the previous literature does not tell how such offerings could in practice be introduced.

In addition, many of the performance-based studies concentrate on the dyadic relationship between buyer and supplier (Essig et al. 2016), some are conducted from the buyer's perspective (e.g. Ng & Nudurupati 2010; Nullmeier et al. 2016) and some have also applied the supplier's

perspective (e.g. Homburg & Stebel 2009; Kleemann & Essig 2013; Liinamaa et al. 2016). Triadic approach as in this case is less common approach (e.g. Howard et al. 2016) and it expands the area of research to cover network dynamic between the involved parties (Choi & Wu 2009; Nätti et al. 2014). Buyer's perspective seems to be more common in the academic research though not thoroughly studied, and thus it has been chosen for this study. Accroding to Selviaridis and Wynstra (2015), the literature of performance-based contracting so far has not taken a holistic view of methods within performance-based contracting or otherwise presented relevant implications to supply management research. In addition, the literature *lacks studies of the deeper understanding of both buyer-supplier relationship and the triadic relationships in performance-based contracting* (Holmbom et al., 2014; Essig et al. 2016) where the value is co-created and co-produced, which should further enlighten the complexity of the relationships. Since the current studies have mainly concentrated on few major industries, the researchers believe there can be hidden aspects that are still unidentified in other industries (Hypko et al. 2010A).

Literature acknowledges that there are barriers in value- and performance-based business models (Liinamaa et al. 2016), but is unable to offer solutions to overcome those barriers (Meehan et al. 2017). Related to this, performance-based contracting might seem to improve the performance, though the artificial improvement is just a result of developed documentation or improved performance measures (Christianson et al. 2008). Thus, empirical evidence of performance-based contracting is clearly less common, and *the literature misses empirical knowledge of why and how suppliers are willing to take the financial risk of performance-based contracting* (Selviaridis & Norrman 2014) *and how this risk is being managed* (Gruneberg et al. 2007). Consequently, literature seems to lack which factors from buyer's side are actually behind maximum effectiveness of performance-based contracting (Randall et al. 2011). Additionally, triadic relationships have received little empirical research (Tate et al. 2010), though there is a vast amount of triadic business service relationships (van der Valk & van Iwaarden 2011). Straub (2007) also notes that the performance-based contracts are often so complicated and unique that creating a general framework is not possible but rather introducing the main ideas can bring the value.

Triadic approach has received increased popularity among the literature, and the characteristics of triads can vary in shape, what kind of relations there are between the actors, how strong those relations are and how each actor can be seen and act as a single entity (Vedel et al. 2016). Traditionally, triad is seen to consists of a buyer, a supplier and a customer (Wynstra et al. 2015), thus forming the smallest unit of network (Choi & Wu 2009). However, the triad can also be formed in other ways too, and for example Tate et al. (2010) study present triad where two of the actors are within the same company. Though many studies apply triadic approach, some have tendency to take one actor's perspective or study a dyadic relationship between two actors rather than studying each actor as a coherent, equal and independent unit (Vedel et al. 2016). *Current literature does not have or has only little research of performance-based contracting in triads* (van der Valk & van Iwaarden 2011; Essig et al. 2016; Wynstra et al. 2015), and the few studies do not offer clear and coherent explanation of what is a triad, how to study triads and what is actually relevant (Vedel et al. 2016). In this case, the case company's purchasing department, mills and suppliers form the triad, and each of the actors and their relationships are aimed to scrutinize equally.

1.2 Research objectives & questions

The main focus of this thesis is to study how performance-based contracting (PBC) could be introduced, what would it require from the actors in triad, how willing the parties are in engaging in this new type of cooperation and what are the possible drawbacks and barriers that should be overcome before contracting can be done successfully. The study also aims to fill in the research gap in better understanding the dynamic relationship between the buyer and supplier under performance-based contracting, and especially what are the perceptions, expectations, barriers and goals for PBC. In addition, the chosen industry is pulp and paper industry and more precisely, paper machine category is chosen as the context of the study. Choosing paper machine category offers unique glance to an industry in which the topic has not been studied before.

Performance-based contracting is not a new topic, the interest towards it has increased in the last years (Selviaridis & Wynstra 2015). However, the literature is not always coherent and some findings have been contradictory and inconsistencies between the studies can still be found.

Since the literature lacks consistent empirical evidence (Tate et al. 2010; Selviaridis & Norrman 2014), the thesis would offer remarkable contribution to current literature and possibly explain the gaps within. Taking a bigger picture, the study aims to give a guideline where to start the journey towards PBC and what should be taken into account. Hence, the main research question is formed as follows:

How to effectively introduce performance-based contracting in triads?

The above-stated main research question is further divided to four sub-questions that aim to identify the perceptions and expectations of PBC, together with the possible barriers and the goals of PBC. Thus, the sub-questions are formed as follows:

How do the actors perceive performance-based contracting?

What do the actors expect from PBC?

Why is PBC seen challenging?

Why is PBC seen beneficial?

As a result, the thesis aims to give managers an example on how performance-based contracting is reacted to, and how could be introduced, thus enabling them to engage in the process and maybe avoiding certain pitfalls. Though the study has a triadic approach on PBC, it can offer many companies with valuable guidelines and checklists to start with their journey towards performance-based contracting.

1.3 Research methodology

Introducing performance-based contracting is being studied by conducting a qualitative abductive case study. The study is an embedded single case study (Yin 2018), where the focus is on the actors of the triad. Qualitative research focuses on the aspects that are difficult to quantify (Hirsjärvi et al. 2009), and its advantage is understanding and explaining meaning-making processes (Tavory & Timmermans 2014). Hence, qualitative research is characterized by high descriptiveness and rich qualitative data, thus illustrating social construction of reality (Eisenhardt & Graebner 2007). In research questions this is illustrated so that those aim to answer to “why”

and “how” questions (Yin 2018). It is seen beneficial in this case since the study concentrates on how prepared, willing and capable supplier is to this new contracting method and why so.

Typical for qualitative study is to take cases that challenge the prevailing cases into account and use those to fine-tune your own case (Tavory & Timmermans 2014). This again is possible, since case studies do not aim to create generalizable results but rather enable deeper understanding of a situation (Yin 2018). Case study in turn is found the most suitable, since case research is “a strong method in the study of change processes as it allows the study of contextual factors and process elements in the same real-life situation” (Halinen & Törnroos 2005, 1286) and it looks for evidence of reasons behind relationship (Eisenhardt 1989). Additionally, abductive case study was chosen because it enables innovativeness and focuses on finding situational fit between the observed empirical evidence and scientific theory, and furthermore to offer explanation of the situation or relationship (Tavory & Timmermans 2014). It offers a less theory-driven process where speculative theories that aim to construct theory based on surprising research findings and where variations and alternatives need to be constantly analyzed (Järvensivu & Törnroos 2010; Tavory & Timmermans 2014). Moreover, case studies contribute to the current theory with testability, novelty and empirical validity, filling the gaps within the research area (Eisenhardt 1989).

The primary source of the research data is interview data from the actors of the triad. Documentation, observations and archival records are used as secondary data source. 25 interviews were held in total either face-to-face or via Skype, each lasting from 57 minutes to 115 minutes. The set of interviewees quite equally represents all the actors in triad, since seven interviewees represent purchasing department, eleven represent eight mills and seven represent three different suppliers. The buyer, referred as Alpha, is large globally operating company and its suppliers, referred as Beta, Gamma and Delta, supply Alpha’s mills with items within paper machine clothing category. The interview data was further coded, categorized and interpreted in a sense that the transparency is maintained with logical line of evidence.

1.4 Conceptual framework

Conceptual framework of the study evolves around the research questions formed from the current literature about performance-based contracting and service triads. Since the study focuses on the transition process of introducing performance-based contracting, especially how performance-based contracts are initiated and how the preliminary work should be done, are under examination. Naturally, when the idea is thought through, the next steps are to design the contracts, implementation of the contracts and finally managing and monitoring the ongoing contracts. Since the aim of the study is to understand how performance-based contracting can be effectively introduced in service triads, the conceptual framework was structured as the Figure 1 below shows. The actors of the triad, namely purchasing department, suppliers and mills, form a tringle to represent the triadic research settings. Within the triad are the research questions: the sub-questions, namely perceptions, expectations, barriers and goals of the actors are seen to have an impact on the introduction of performance-based contracting and hence, these topics encircle the main topic.

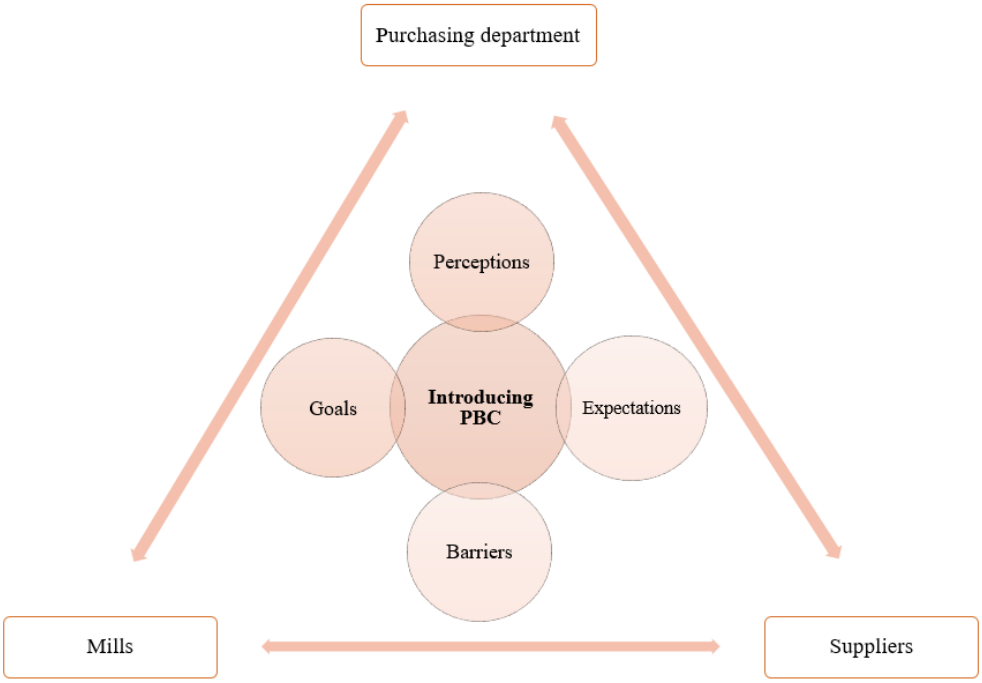

Figure 1. Theoretical framework of PBC in triadic context.

1.5 Key definitions

Performance-based contracting = contracting method aiming to improve performance, applying use rather than own strategy and where at least some of supplier payment is tied to performance.

Service triad = service triad describes the research settings, meaning that there are three actors that are interconnected and interdependent. In this study, the actors of the service triad are purchasing department, suppliers and mills.

Perceptions = perceptions describe the interviewee's mindset, attitude, impression and image of a certain topic. Perceptions are highly personal matters and both what is being said and what is actually meant are trying to be understood and encapsulated.

Expectations = expectations describe the anticipations and believes of performance-based contracting. Expectations form the framework or boundary conditions, and what at the minimum should be taken into consideration when thinking of PBC.

Barriers = barriers are all the internal and external matters or obstacles that could possibly slower, hinder or prevent the PBC process. Barriers should be identified and tackled to ensure smooth transition.

Goals = goals are the expected benefits of PBC which describe what the interviewee would like to or would think that is going to be achieved with the new contracting model.

The remainder of the thesis is organized as follows: to conclude the introductory chapter, the key literature is presented in the Table 1. Then, the next two chapters concentrate on the scientific literature on performance-based contracting and service triads. How performance-based contracting can be measured, the main barriers and benefits, dimensions of performance-based contracting and the contract design are introduced among other relevant topics. Fourth chapter introduces research methodology, explaining what the empirical case is about, why abductive case study was chosen as a research method and how the data was further collected and analyzed. Fifth chapter then presents the empirical findings based on the themes of perceptions,

expectations, barriers and goal. After that, the findings are further discussed in chapter six, giving both the theoretical implications and managerial implications, eventually wrapping up the study with limitations and ideas for future research.

Table 1. Literature review on performance-based contracting

Author	Year	Title	Main findings	Journal
Kim et al.	2007	Performance Contracting in After-Sales Service Supply Chains	Aim: evaluating fixed-priced, cost-plus and performance-based pricing models and set performance requirements and risk sharing in after-sales service supply chains Cost reimbursement ratio will decrease (increase) over time if the supplier is relatively more (less) risk-averse than expected and the opposite to when it comes to performance; the more risk averse the supplier is, the lower the cost compensation is over time As the product matures and time passes on, contracts often move from cost-plus to PBC	Management Science
Caldwell et al.	2009	Procuring complex performance in construction: London Heathrow Terminal 5 and a Private Finance Initiative hospital	Aim: understand the practices that compose PCP in major construction projects that are also product-service system Start-up phase is critical, and cooperation tends to be more successful if the start-up time (communication, supplier selection & relationship management) are invested in, instead of formal specifications	Journal of Purchasing & Supply Management
Ng & Nudurupati	2010	Outcome-based service contracts in the defence industry — Mitigating the challenges	Aim: recognizing the barriers of outcome-based contracting in defence/aerospace firms and how those could be avoided 11 factors were identified to overcome the barriers of implementing outcome-based contracting: align expectations, team work, share information, share materials, access resources, clear roles, complementary skills, empowerment, behaviors & attitudes, customer's control and firm's control	Journal of Service Management
Kleemann & Essig	2013	A providers' perspective on supplier relationships in performance-based contracting	Aim: introduce performance-based contracting in upstream supply chains and especially between the systems integrator providers (suppliers) and their sub-suppliers Both supplier and sub-supplier should be included long-term from the beginning of PBC to enhance the communication, build trust and mutuality and to efficiently manage uncertainty	Journal of Purchasing & Supply Management
Ng et al.	2013	Outcome-based contracts as new business model: The role of partnership and value-driven relational assets	Aim: to study outcome-based contracts in equipment service and investigate what are firms' capabilities to achieve the expected performance Performance-based contracting business model requires total change and questions the traditional boundaries of organizational departments of operations, management, marketing and strategy and forces companies to re-think new ways of organizing knowledge and themselves To achieve outcomes in performance-based contracting, co-production and co-creation are required together with value-driven cooperative approach	Industrial Marketing Management
Selviaridis & Wynstra	2015	Performance-based contracting: a literature review and future research directions	Aim: to review and combine the PBC literature across different disciplines Performance-based contracting should have the ability to effectively specify, measure and evaluate the performance together with appropriate risk level and incentive system that motivates the supplier to perform the best possible way	International Journal of Production Research

Essig et al.	2016	Performance-based contracting in business markets	Aim: advance understanding of PBC in business markets by assessing five (5) advanced PBC articles Identified four (4) research gaps: PBC finalization, grounded on key theories & closing the research gap, effort on firm-level studies and triadic perspective or more	Industrial Marketing Management
Howard et al.	2016	Performance-based contracting in defence industry: exploring triadic dynamics between government, OEMs & supplier	Defence contracts include 3 parties aka a triad: government agencies, OEMs & suppliers (boundary between the roles of private and public sector) Supply base rationalization is needed to ensure PBC and relationships between the parties work effectively The arrangements significantly reduce the interdependence between principal & agent, and the government becomes more dependent on supplier The roles need to be clear in PBC or it will underperform or fail if the roles keep changing PBC needs to take a more nuanced and iterative approach to risk transfer	Industrial Marketing Management
Liinamaa et al.	2016	Performance-based and functional contracting in value-based solution selling	Aim: illustrate complicated pre-contractual integration process in value-based selling and how to transform the value functions into functional contract form Since advanced PBCs are difficult and expensive, it can limit the pricing models or restrict the time horizon to introduce them. Contracting models are often defensively and functional contracting during sales phase can have great managerial value. Running legal sales parallel to "traditional" sales process could facilitate the understandability of the contracts.	Industrial Marketing Management
Nullmeier et al.	2016	Outcome attributability in performance-based contracting: Roles and activities of the buying organization	Aim: identifying uncertainty characteristics that arise from buyer-supplier relationships and how contracting characteristics can enhance the effectiveness of performance-based contracting when the uncertainty is high Linking the contract management with designing the contract to avoid possible shortcomings of the written contract and learning to give the supplier free hands to do the work yet simultaneously ensure that they are available and engaged	Industrial Marketing Management
Sumo et al.	2016	Using performance-based contracts to foster innovation in outsourced service delivery	Aim: to better understand the use of PBCs in relation to supplier-led innovation in a real world setting The buyer should give supplier autonomy to freely optimize their processes, but to stay involved by monitoring cooperation. Contrary to common believes, the contracts can positively affect the supplier innovation	Industrial Marketing Management

2 Performance-based contracting

While performance-based contracting (hereafter referred as PBC) has become increasingly popular in the current academic literature, the concept lacks a consistent definition (Hypko et al. 2010A; Selviaridis & Wynstra 2015), and many terms are used as synonyms for PBC (Essig et al. 2016). For example terms such as outcome-based contracting (Ng et al. 2009 & Ng et al. 2013), performance-based logistics (Kim et al. 2007; Ng et al. 2009; Glas et al. 2011), value-based selling (Terho et al. 2012; Liinamaa et al. 2016), value-based procurement (Meehan et al. 2017), pay for performance (Essig et al. 2016), performance-based service contracts (Buchanan & Klingner 2007) and contracting for complex performance (Caldwell & Howard 2014) are used by the researchers, just to name a few. Table 2 presents the definitions of the main terms, which authors use them and which industries these terms concern.

Though most of the terms share similar characteristics (Selviaridis & Wynstra 2015) (Table 2), some terms can have different nuances: for example Ng et al. (2009) and Kim et al. (2007) state that the term outcome-based contracting would cover more than term PBC, though reader has hard time spotting the differences. Similarly, Holmbom et al. (2014) state that PBC is wider topic than performance-based logistics, which often covers only logistics support. In general, all the terms focus on the same core idea that instead of telling supplier how to do a certain task, the supplier is told what kind of output and performance is expected and leave the supplier to find the suitable way to do so (Martin 2002). For example Ng et al. (2009) and Kim et al. (2007) use a term performance-based logistics to explain these contracts, though in this case, the term PBC is used to make the literature easily comparable and homogenous. Since the supplier is given free hands to work how he sees fit, the responsibility together with the risk of the outcome is shifted to the supplier in the first place and secondary to the buyer (Ng et al. 2013; Nullmeier et al. 2016).

Table 2. Key terms identified from the literature and their definition

Term	Definition	Author	Industry
Performance-based contracting (PBC)	PBC is a promising contractual mode where at least part of supplier payment is tied to the achievement of specific and measurable performance standards and requirements, and which enable business partners to adopt 'use rather than own' strategies	Selviaridis & Wynstra 2015, Essig et al. 2016, Liinamaa et al. 2016, Mouzas 2016	General term, applicable to several industries
Performance-based logistics (PBL)	PBL is addressing the problem of extraordinary support costs for complex product systems and aims to replace traditionally used fixed-price and cost-plus contracts to improve product availability and reduce the cost of ownership by tying a supplier's compensation to the output value of the product generated by the customer	Kim et al. 2007, Ng et al. 2009, Glas et al. 2011	Defence & military
Outcome-based contracting (OBC)	OBC is a contracting mechanism that allows the buyer to pay for the supplier not according to its service activities such as material and repairs, but based on the outcome of such activities in continual use situations i.e., the number of hours of engine in the air	Ng et al. 2009, Ng & Nudurupati 2010, Ng et al. 2013	General term, applicable to several industries
Performance-based service contracts (PBSC) / service acquisition (PBSA)	PBSC and PBSA (primarly government and proprietary) deal with the ways to change the language of statement of work to incorporate measurable performance requirements and how the measurements will be done	Buchanan & Klingner 2007	Governmental projects
Contracting for complex performance (CPC)	CPC contracts are complex by nature as they consist of agreements covering the design, build, finance and operation phases of long-term projects, by using terms of a matrix comparing high and low transactional complexity, versus high and low infrastructural complexity	Caldwell & Howard 2014	Large and complex construction projects
Value-based procurement	Value-based procurement sees a collaborative effort through strategically aligning suppliers' resources, products, and services to broad outcomes-based goals of the organisation and where it explores the full remit of cost/benefit across the range of interdependent activities	Meehan et al. 2017	Health service & governmental projects

Defining PBC

Essig et al. (2016, 6) define PBC as "a contract which provides incentives for business outcomes". According to Nowicki et al. (2018, 13) the idea of PBC is to "create a mutually beneficial relationship between a buyer and a supplier where the supplier is compensated based on their ability to properly support a customer's system (i.e., the supplier's performance). It can also serve as means of buying a solution or a novel purchasing strategy (Essig et al. 2016). Randall et al. (2011, 333) define that a leader who supports PBC has "the ability to create a performance-based focus, align activities, and develop an entrepreneurial (risk accepting) culture". Typical for PBC is that there is a clear distinction between the buyer's performance goal (Benzer et al. 2014) and the supplier's implementation (Kim et al. 2007). Supplier's payment or rewarding is also tied to their performance, at least to some extent (Benzer et al. 2014; Selviaridis & Norrman 2014; Selviaridis & Wynstra 2015). Taken together, PBC in this study is defined as *a contractual mode where performance rather than inputs are purchased from the supplier so that at least part of supplier's reward is tied to its measurable performance*.

PBC offers a unique strategy for demand management, where stimulating innovation aims to increase reliability and efficiency so that the costs related to fro example spare parts, repair and maintenance would be decreased (Randall et al. 2015). This type of strategy is has not been seen in before in retail and manufacturing industries (Randall et al. 2015). The core idea of PBC is to enable the business partners to use the services without necessarily owning them, moving from single transactions to payments based on for example monthly subscription (Ng et al. 2009; Ng & Nudurupati 2010; Essig et al. 2016). These kind of subscription goods are already common in B2C (such as Netflix and Spotify), and PBC provides an opportunity to present this business model to B2B markets (Essig et al. 2016). Hence, PBC focuses on the outcome rather than the process and enables supplier to produce the outcome in the most suitable and convenient way for them (Nullmeier et al. 2016). For example Rolls Royce has been a forerunner of PBC in B2B markets, introducing its "Power-by-the-hour" and "Total care" contracting, where the maintenance is paid based on how many hours of power the buyer is able get from the engine (Ng et al. 2009; Visnjic et al. 2017).

Liinamaa et al. (2016) identify three critical features of PBC: 1) the emphasis on the value the buyer can bring with its contractual performance, 2) divergent pricing model compared to fixed-price pricing model and 3) incentivizing system that targets to a certain level and type of performance. Selviaridis and Wynstra (2015) are in unison with Liinamaa et al. (2016) by presenting three dimensions of PBC, namely performance, risk and incentive. Nowicki et al. (2018) present that in order to co-create value, both buyer and supplier need to use their knowledge, skills and capabilities for common goal. Since the performance-based model differs from traditional procuring (Kleemann et al. 2012), the supplier is also seen as active member to create value in the process (Straub 2007), and thus the price-quality ratio might or even should be preferred over the lowest price when choosing the supplier.

Glas et al. (2011) introduce four perspectives of PBC: lifecycle, cooperation, implementation and pricing. Since the investment costs of a product are often only a minor part of the operating costs of the product's whole lifecycle, lifecycle perspective is important in PBC (Glas et al. 2011). Besides, to reap the benefits of PBC, long-term approach is often needed (Sols et al. 2007). Guajardo et al. (2012) agree to this, stating that PBC is found suitable contracting method because of substantial amount of after-sales costs and complex nature of the services. When it comes to implementation, there is no universal solution how to implement PBC successfully, and hence each PBC needs to be implemented individually (Glas et al. 2011). When it comes to cooperation, the closer the cooperation in PBC the better, though the actors can decide how closely they want to cooperate (Glas & Kleemann 2017).

Measuring PBC: KPIs

First and foremost, contracting based on performance can only work, if the outcomes are measurable (van der Valk & van Iwaarden 2011) and the higher the measurability, the higher the attractiveness of PBC (Selviaridis & Norrman 2014). Performance metrics are essential for the success of PBC, since they set the guideline on evaluating if the required performance is being achieved (Brown & Potoski 2003; Nowicki et al. 2010). Performance is also seen as one of the key dimensions of PBC together with incentive and risk, and thus should measuring, reporting and evaluating performance be vital for designing and managing PBCs (Selviaridis & Wynstra

2015). Sols and Johannesen (2013, 458) crystalize the importance of correct measures by arguing that "Only if the metrics that are selected to measure system performance truly capture what is important to the system user will the initiative succeed". However, choosing right performance metrics in contract design phase is challenging (Berkowitz et al. 2003), since it should have the ability to effectively specify, measure and evaluate the performance together with appropriate risk level and incentive system that motivates the supplier to perform the best possible way (Selviaridis & Wynstra 2015).

Collecting and analyzing performance data takes often place at contract management phase (Selviaridis & Wynstra 2015), and for example Tineo (2007) argues that performance can be evaluated at three levels, including management, long-term and operational. Often the more complex the service, the more challenging it is to measure the outcome and activities required to achieve it (Brown & Potoski 2003). Besides choosing the right performance metrics, defining the metrics and their possible failure/success rates can be complicated (Holmbom et al. 2014), and therefore finding realistic measures that illustrate the organizational reality is vital in order to ensure performance measurement efficiency (Greiling 2006). These key measures to assess the performance are seen as key performance indicators (KPIs), and the amount of them in a contract is depend on the complexity of the service, ranging from a few to several KPIs (Glas & Kleemann 2017). Equally, KPIs should represent measures that are relevant for company's strategic planning and not only accountability tools (Greiling 2006).

Holmbom et al. (2014) point out that KPIs can be used to measure performance on different systems levels and thus take into account diverse set of needs. For suppliers, mutually agreed KPIs can lessen the perceived risk (Selviaridis & Norrman 2014). Furthermore, KPIs of PBC can be seen to complete information between the parties, since those show if the suppliers are actually able to reach the performance level agreed (Kleemann & Essig 2013). Companies also need to keep in mind that evaluating performance happens often continually, and when the improvements start to take place, some performance metrics might need to be modified or even changed (Christianson et al. 2008; Howard et al. 2016).

Generally, key performance indicators can be divided into three groups: physical performance indicators, financial performance indicators and informational monetary indicators (Mouzas 2016). Mouzas (2016) identifies for example property rights and geographical coverage as a part of physical performance indicators, and electronic data exchange as informational indicators. Several studies identify reliability as one of the most important physical performance indicators in PBC (Sols et al. 2008; Caldwell et al. 2009; Nowicki et al. 2010). The industry has also an effect for the metrics chosen and for example, in the study of Nullmeier et al. (2016, 28) on cleaning services, key performance indicators are quality (cleanliness of trains), safety (processes and materials used) and personnel (education provided and employee satisfaction).

Several studies identify product availability as a key physical performance indicator (Kim et al. 2007; Sols et al. 2007; Nowicki et al. 2010; Glas et al. 2011; Sumo et al. 2017). Product availability is somewhat similar to product readiness, meaning that the required product with the required capacity is ready when needed (Ng & Nudurupati 2010). For example, system/product availability and operating hours (flying hours) are important measures of performance especially in aerospace (Ng & Nudurupati 2010). Ng and Nudurupati (2010) note that facilitating availability often demands pro-active maintenance from the supplier's side. Availability expectations towards the supplier can be remarkable, and for example in Sumo et al.'s (2017) study, the supplier was rewarded only when functional availability was 100 percentages. Glas and Kleemann (2017) and Glas et al. (2011) identify mean-time-to-repair and mean-time-between-unscheduled-repair (MTBUR) as relevant KPIs to measure the physical performance, and which should improve over time. Like the other previously mentioned indicators, logistic footprint is one of the physical indicators, whereas response time and delay time are used as informational indicators when measuring performance (Sols et al. 2008; Nowicki et al. 2010).

Mouzas (2016) identifies trade spending and return on assets as financial performance indicators. Also indicators such as cost reduction, cost savings (Sumo et al. 2017), cost per unit usage (Sols et al. 2008), profit (Nowicki et al. 2010) and return on investments rather than return on sales are financial KPIs. In addition to physical, financial and informational indicators, there are two more categories: behavioral indicators such as credibility, fairness and goodwill (Caldwell et al. 2009) and other indicators which measure for example, the market share of the supplier

(Essig et al. 2016). Table 3 lists performance indicator category and gives examples of KPIs from each category.

As mentioned before, target measures depend on industry, and for example Guajardo et al. (2012) identify product reliability as the key performance metric for aerospace industry and Collins-Camargo et al. (2011) identify foster care re-entry as one performance indicator for child welfare. When choosing the right indicators, the targets set depend on who are deciding the targets and what factors are needed to measure the performance to decide whether the set targets were met or not (Eldridge & Palmer 2008). The target performance should be carefully thought to be able to meet the buyer's real needs and simultaneously offering supplier reasonable challenge to improve their performance (Sols et al. 2007; Sols et al. 2008; Holmbom et al. 2014). In addition to target measures, some other performance metrics such as minimum level of performance and timespan need to be decided (Berkowitz et al. 2003; Sols et al. 2008). Therefore, the measures need to be observable and verifiable (Martin 2007), which further can lead to choosing performance measures that are easily quantifiable which are preferred over measures of performance quality (Eldridge & Palmer 2008; Bonnemeier et al. 2010). For example, companies tend to choose amount of cost savings as a performance measure rather than customer satisfaction, since cost savings are easier to measure reliably than satisfaction (Bonnemeier et al. 2010).

When measuring performance, there should be several measures to ensure the effectiveness (Sols et al. 2008). It is important to understand that measures are often interrelated and overlapping (Nowicki et al. 2010), though they might be contradicting by nature (Sols et al. 2008). The performance measures can be either the lower the better (response time) or the higher the better (operational availability) (Sols et al. 2008; Mirzahosseinian & Piplani 2011). Like Nowicki et al. (2010, 686) claim, performance indicators often "include minimizing logistics footprint, maximizing operational availability, maximizing mission capable rates, maximizing reliability, maximizing maintainability (i.e., minimizing time to perform maintenance actions), maximizing supportability (i.e., minimizing wait time)".

Table 3. Performance indicators and KPIs in PBC

Indicator category	KPI's
Physical indicators	Property rights
	Geographical coverage
	Availability
	Reliability
	Mean-time-to-repair
	Mean-time-between-unscheduled-repair
	Quality (cleanliness)
	Safety (processes and materials used)
	Personnel (employee satisfaction and education)
	Logistic footprint
Financial indicators	Trade spending
	Cost per unit usage
	Return on assets
	Cost reduction / cost savings
	Profit
	Return on investment
Informational indicators	Electronic data exchange
	Response time
	Delay time
Behavioral indicators	Goodwill
	Fairness
	Credibility
Other indicators	Market share of supplier

2.1 The benefits of PBC

Performance-based contracting can provide both parties with several benefits, enabling win-win sitation (Kumar & Markeset 2007; Sols et al. 2007; Hypko et al. 2010B; Nowicki et al. 2010), either by introducing improvements in terms of cost or performance (Kleemann et al. 2012). For example, PBC is often used when purchasing complex services that call for persistence and effort during their long lifecycles, and can thus be seen beneficial contracting method (Kleemann & Essig 2013). Benefits can be widely identified as buyer's benefits, supplier's benefits and benefits for both parties (Figure 2). However, the companies sometimes tend to forget how improvements coming from PBC not only benefit the companies involved, but also improve the quality or otherwise bring more value for the (end-)customers (Fearnley et al. 2004). For example, in the healthcare industry the PBC targets, in addition to reduced costs, to improved customer welfare (Faith et al. 2010). In turn, in public transportation PBC and optimizing the schedules improve the traveling quality to customers together with increasing revenue to the transportation company (Fearnley et al. 2004). Therefore, the benefits for other stakeholders/network/value chain should also be taken under examination.

Companies that engage in PBC aim to create new type of value for the customer, and further need to take these ambiguous characteristics of value into account. This value is being created by aligning interests, and works as the key rationale (Kleemann & Essig 2013; Selviaridis & Norrman 2015). Compared to product-based business models where contracts of goods often make a difference between purchasing the product and the after-sales support, performance-based business models have different perspective on the aspects of broader time and cost scope and can extent to cover the whole lifecycle of the service (Kleemann & Essig 2013; Meehan et al. 2017). In PBC, the cost occurring after production are larger than the cost of production, and therefore long-term or lifecycle perspective is often chosen (Nowicki et al. 2018).

Benefits for buyer

For buyer, as a result of PBC, the costs decrease since internal specialists are not needed anymore (Straub 2007; Hypko et al. 2010B), together with *more stable business with less disruptions* (Nowicki et al. 2010; Randall et al. 2015). Decreased failure rates and improved maintenance further lead to systems running more efficiently and thus lower employee requirements

(Nowicki et al. 2010). For example, technical and specialist knowledge is not needed in-house, since the supplier will take care of it (Straub 2007). Guajardo et al. (2012) found out that from buyer's perspective, PBC *increases both product utilization and reliability*. Hence, lower control is needed, because the supplier is given the autonomy to conduct the service, which often leads to reduced costs and risks (Straub 2007; Tineo 2007). All in all, performance-based contracts contribute to the productivity and quality performance of the company, but only if the buyer can match right machinery and superior knowledge with performance criteria (Hypko et al. 2010B). Randall et al. (2015, 214) also explain that PBC "provides the buyers a consistent level of performance at a consistent price" and often positively contribute to the lifecycle costs. PBC works kind of like an insurance policy that creates cash flows for buyer at a certain cost (Guajardo et al. 2012). Buyer receives *competitive advantage* because of advantage in quality and costs and the ability to differentiate itself from competitors (Glas & Kleemann 2017). Though costs are vital part of the cooperation, PBC can also teach buyers to value more the cooperative supplier relationships and their benefits that often go beyond lower price or lower costs (Kleemann et al. 2012).

Buyer should understand and address their superior knowledge to be able to cut down the operational costs (Hypko et al. 2010B). Transferring the responsibility of inventory from buyer to supplier also decreases buyer's administration and inventory costs since instead of inventory management they only need to provide the supplier with relevant information to enable them to optimize their actions (Claassen et al. 2008). Implementing PBC also *cuts out inefficiencies* resulted from suppliers opportunistically sold unfit machinery and equipment (Hypko et al. 2010B) and *reduces the possibility of unsatisfactory quality* (Tineo 2007). With adequate design, performance-based contracting buyers are able to acquire better value from the suppliers, which further contributes to better overall results (Tineo 2007). Supplier can work as a value amplifier by applying their specific resources such as knowledge to improve the design or production (Aarikka-Stenroos & Jaakkola 2012). Moving to PBC also often means that the number of individual contracts is decreased when they are bundled to PBC (Kleemann et al. 2012).

Benefits for supplier

From the supplier's perspective the PBC benefits are connected to better understanding the service expectations, collecting data from performance factors, the interconnections between inputs and outputs and clarifying the unmanageable external factors which affect the performance (Selviaridis & Wynstra 2015). The more the incentive system is related to performance, the *more accurate and precise data* of performance and cost the supplier needs (Martin 2007). Here, information technology can be seen as a great tool to data collection and performance measurement systems (Selviaridis & Norrman 2014). With the help of technology and new role, supplier is also able to work more seamlessly and thus save time (Visnjic et al. 2017).

Supplier and buyer become closer in PBC process due to increased cooperation, and the supplier is often able to gather firsthand experiences in addition data (Hypko et al. 2010B; Nowicki et al. 2010). With better performance, the buyers are also more likely to be loyal, thus *increasing customer retention* (Kumar & Markeset 2007; Hypko et al. 2010B) as well as customer satisfaction (Ng et al. 2009). In addition, supplier can gain *competitive advantage compared to other suppliers* as a result of increased knowledge of its customer (buyer) and their core processes (Hypko et al. 2010B). Competitive advantage is also visible in Howard et al.'s (2016) study, where they found that the supplier in triadic PBC was able to gain a stronger position and thus better access to future deals compared to other suppliers.

Suppliers also have the opportunity to *increase their revenue* (Sumo et al. 2016) by developing product reliability or improving the performance in a way that suits them best (Nowicki et al. 2010; Guajardo et al. 2012; Holmbom et al. 2014). Increased risk also enables increased the ability to make better profit (Nowicki et al. 2010). Besides, suppliers feel that they have *more autonomy and flexibility in their work*, thus encouraging creativity and innovation (Nowicki et al. 2010; Sols & Johannesen 2013). Though the supplier would have the possibility to act opportunistically due to autonomous role, pay-for-performance and low term specifity this does not take place because cooperation and innovations enable supplier to be more profitable (Sumo et al. 2016).

PBC also enables supplier to better manage over the maintenance process together with key indicators (Straub 2007). Supplier needs to rely on his capabilities which exceed the boundaries of traditional manufacturing firm (Hypko et al. 2010B), and with greater role and learning they might be able to offer buyer a better and broader solution than initially expected (Visnjic et al. 2017). The superior organizational capability enables the company to extract further rents from the markets through more similar contracts and could thus motivate the company to invest in aspects also outside the contract, leading to stronger cooperation and eventually turning the performance-based contract into a self-enforcing agreement (Ng et al. 2013). The better the supplier performs, the more likely they will receive more contracts and cooperation in the future (Martin 2007).

Benefits for both buyer and supplier

Since PBC increases the supplier's motivation to act accordingly, the quality of performance and *outcome of the service becomes better* (Kumar & Markeset 2007; Brucker & Stewart 2011) and often simultaneously with less costs (Straub 2007; Hypko et al. 2010B; Nowicki et al. 2010; Randall et al. 2015). As Kleemann et al. (2012, 154) state " The principle objectives of the new approach are to lower cost or at least convert them into variable costs, maintain or increase the system performance (e.g. availability of an aircraft) and to strengthen a joint perspective on purchasing and operating costs". Also, performance-based contracts improve the quality of the projects and enable more effective and efficient management of the projects overall (Straub 2007). Incentives in performance-based contracts can enable the supplier to behave according to the buyers needs and thus reduce the costs in the long run (Ng et al. 2009; Sumo et al. 2016).

Nevertheless, Berkowitz et al. (2003) remind that it is not possible to maximize both cost efficiency and capabilities, but the companies need to decide which one to invest in. Concentrating on performance leads to *financial benefits* such as decreased costs when regarding the whole lifecycle (Ng et al. 2009; Nowicki et al. 2010; Randall et al. 2011), better return on investment (Kumar & Markeset 2007). According to Straub (2009), PBC can result in lower overall costs compared to traditional competitive bidding. The cost savings identified are often approximately 20 percentages, (Straub 2009) and both buyer and supplier can enjoy those since they are incentivized to aim to common goal (Ng & Nudurupati 2010). However, Holmbom et al. (2014, 971)

question the amount of costs savings, since they claim that it is not clear how the cost savings are shared between buyer and supplier and that "It is likely that the supplier will demand a price premium due to the increased financial risks and thus that the customer's cost will remain the same or even increase".

As a result of PBC, *information asymmetry between parties decreases*, since both parties communicate more frequently and thus continually assess the contractual performance (Mouzas 2016). Hence, PBC makes both buyer and supplier more reassured and trustworthy about each other (Kleemann & Essig 2013), and where cooperation is believed in and where the set requirements will be met together with reliable delivery (van Mossel & van der Valk 2008; Nowicki et al. 2010). Trust-based relationships between the parties also contribute to the supplier's willingness to take risk and thereafter connect to better risk allocation and cost savings (Straub 2009; Selviaridis & Norrmann 2014). Furthermore, the *stability* for both parties increases and thus *facilitate the forecasting* of the use of equipment and the conditions under which the performance takes place (Ng & Nudurupati 2010; Mouzas 2016). Since there are less disruptions, time span of maintenance periods can be extended and less changes are needed during the project (Straub 2009; Nowicki et al. 2010).

One benefit of PBC is also *learning* which often takes place as a result of intensive interactions, both formally and informally, through for example, meetings, workshops and trainings (Berkowitz et al. 2003; Bol & Moers 2010; Nätti et al. 2014). In general, human resource development has a positive impact on performance (Nurmi 2007), and As Ng et al. (2009, 383) argue "The quicker and better front line employees are able to adapt the greater will be the gains". Bol and Moers (2010) identify this phenomenon as learning-by-doing. Learning-by-doing and many innovations can also result from failures which are also integral part of learning process (Berkowitz et al. 2003; Visnjic et al. 2017). When learning occurs, people tend to share their ideas and thoughts about the learnt aspect with similar people, often either encouraging or discouraging others to take similar actions, leading to snowball effect (Bol & Moers 2010).

Since PBC allows suppliers to access the knowledge among the parties involved (Straub 2007; Claassen et al. 2008), it thus allows and facilitates *innovativeness* (Gates et al. 2004; Tineo 2007;

Nowicki et al. 2010; Visnjic et al. 2017), and in the long run both parties are motivated to improve the products and processes (Ng et al. 2013). Innovations that take place during or as a result of PBC are often incremental innovations, since the supplier is often aiming to prevent equipment breakdown (Ng & Nudurupati 2010; Caldwell & Howard 2014) by continuously improving the products (Hypko et al. 2010B). Unfortunately, incentive systems rarely motivate to invent more influential or radical innovations (Caldwell & Howard 2014), though those are identified as the source of sustainable competitive advantage (Hypko et al. 2010B). In sum, the main benefits that can be reached via PBC are potentiality of loyal relationships between the parties, competitive advantages and future innovations (Glas & Kleemann 2017).

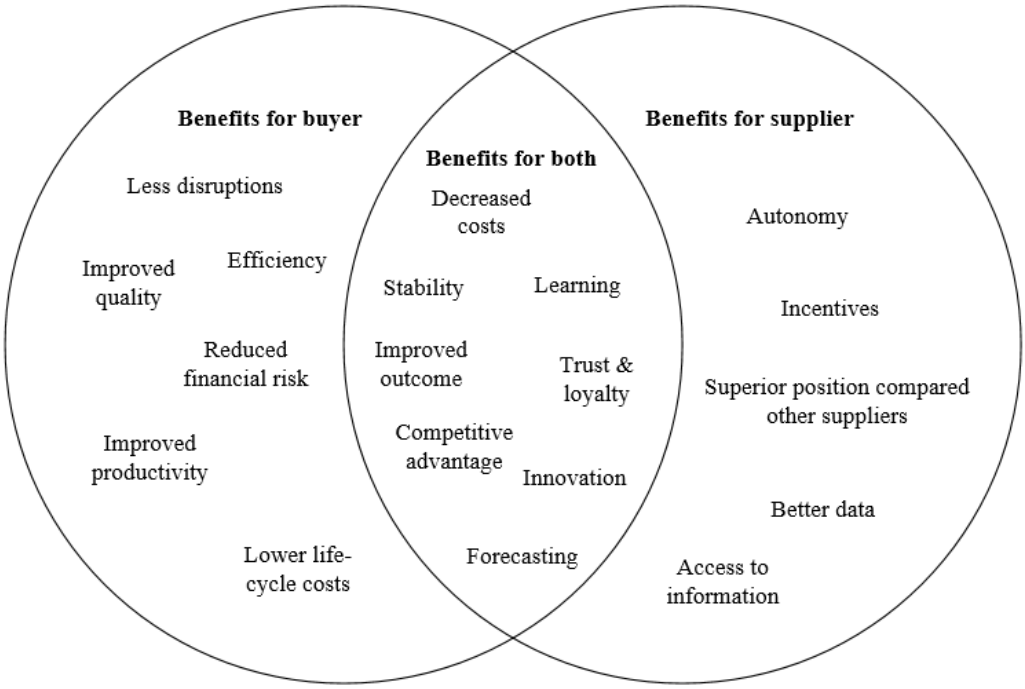

Figure 2. Benefits of PBC for both buyer and supplier

2.2 Potential barriers to PBC

As the extensive amount of benefits of PBC shows, many researches seem to see PBC as an advantage (Eldridge & Palmer 2008), a successful contracting method (Nowicki et al. 2010) or even state boldly that to date, PBC has proven to be successful (Kleemann et al. 2012). Despite these, researchers have also found somewhat contradicting results concerning the benefits of

PBC, and where the outcome uncertainty can counterbalance the acquired benefits (Hypko et al. 2010B). Like Guajardo et al. (2012, 962) note, there are "several complexities that make the quantification of the impact of PBC on metrics such as product reliability a challenging task". For example in Brucker and Stewart's (2011) study, PBC had only minimal or no effects, and in Howard et al.'s (2016) study the PBC was clearly underperforming. Similar to Brucker and Stewart's study, Ssengooba et al. (2012) also found out that in their study that PBC was not able to deliver wanted outcome.

Additionally, the transition from goods-based contracting to PBC does not happen overnight, but requires patience and planning. PBC is rather an evolutionary process where the positive outcomes are not necessarily visible immediately but are often distributed over longer time (Holmbom et al. 2014; Randall et al. 2015). For example in Faith et al.'s (2010) study of publicly funded mental health residential program took six years of profound planning and progressive implementation. Altogether, due to the mixed results, more empirical studies on the topic are needed (Holmbom et al. 2014).

The potential barriers to PBC are often related to defining contracting details in terms of defining responsibilities, what is being measured, who is measuring and how the measurements are translated to incentives (Table 4) (Sols & Johannesen 2013). Transition from goods-based contracting to PBC requires the old and often linear thinking to be replaced with new, multi-dimensional thinking that should include both the supplier and buyer together with their tangible and intangible assets and processes (Ng & Nudurupati 2010). Similar to benefits, some barriers are more faced by buyers and some by suppliers. Addressing the identified barriers, majority of the risks within PBC can be mitigated (Sols et al. 2007), for example with the help of transition contracts where the change from traditional contracting to performance-based contracting is done gradually (Sols & Johannesen 2013). Bol and Moers (2010) also note that companies might want to postpone the application of PBC in their business, but are not necessarily able to avoid it; there can be social pressure to implement PBC, and for legitimacy reasons the company needs to implement it sooner or later (Bol & Moers 2010).

Table 4. Barriers to PBC

Barriers to PBC	Description
Change of roles	Both buyer and supplier are required to re-think their roles and responsibilities, which can lead to perceived loss of control Resistance to change and towards the new roles: supplier is now seen as a consultant and buyer is now part of value co-creation
Change in the organizational structure	Restructuring needed both internally and externally, since the organizational structure to offer services differs from offering products Boundaries between departments become less clear, making it difficult to separate management from operations
(Lack of) Integration and information	Negative perceptions, resistance to change and lack of understanding of PBC cause ineffective integration, information and resource sharing
Opportunism and double moral hazard	Neither buyer nor supplier is able to measure the other party's accomplishments: buyer can pretend that they are not satisfied with the performance and supplier can charge on for additional services
Contract design & management	Challenging to mutually agree on what can and cannot be done under the contract, how to minimize opportunism, who is responsible for what and how to manage the contract afterwards
Relational and resources barriers	Relational barriers: inability to agree on things, perceived unfairness Resource barrier: lack of contract management, resources, competencies and capabilities
Unpredictability	Since PBC is unique to every case, costs, resources and capabilities cannot be precisely predicted beforehand PBC can increase complexity and thus increase the costs (even outweigh the benefits of PBC)

Change of roles

Instead of traditional roles, PBC requires more joint roles in management, strategy as well as in operations (Ng et al. 2013). The supplier takes an increasingly important role and can be seen as a consultant, with specific know-how and skills (Straub 2007; Straub 2009). This change of roles can cause questioning and resistance within buyer's company (Liinamaa et al. 2016), since companies might not be willing to change roles or operations that work, since those together with rules and norms are deeply rooted in the organization's culture and require time in order to change (Kindström & Kowalkowski 2014; Töytäri et al. 2015). Besides, PBC in triads forces actors to change their roles not only in the beginning but throughout the PBC process (Howard

et al. 2016), and if the actors are not able to adapt to these new roles, the triad can break down (Sengupta et al. 2018). As Hartmann et al. (2014) explains, especially suppliers have to move from "what to do" to "how work is done".

Besides, to make it even more complex, the both roles in PBC as well as in triads can change depending on the process phase and thus lead to parties in confusion and eventually underperformance or failure of PBC (Nätti et al. 2014; Howard et al. 2016). The change of roles can make both supplier and buyer to feel loss of perceived control (Ng & Nudurupati 2010), for example when buyer loses some of its know-how when outsourcing the service to supplier (Sols & Johannesen 2013). From the suppliers perspective, the buyer's role becomes more important and might require new ways of thinking, since the buyer is now part of the value co-creation and vice versa (Ng & Nudurupati 2010). Hence, the new roles caused by the transition can stay unclear for the actors and thus lead to underperformance (Howard et al. 2016). In order to prevent that, the transparency of the roles and responsibilities should be fostered throughout the process (Nätti et al. 2014).

Besides, the role of the supplier has an impact: Sumo et al. (2016) identified that establishing PBC with new supplier might be easier than with already existing suppliers, since there is no need to adjust already existing cooperation methods. However, working with new supplier can also pose problems, since product-service systems are hard to predict precisely in advance and can thus lead to value losses (Visnjic et al. 2017). Howard et al. (2016) agree to this by stating that PBC process requires rationalizing the supplier base. These new roles can also challenge the implementation team, since they might receive unnecessary research activities that are just given to them (Ssengooba et al. 2012) but which do not serve the purpose of the implementation team.

Change in the organizational structure

Closely related to the first barrier, is the need to change the organizational structure which is necessary when introducing advanced service offerings like PBC (Fliess & Lexutt 2017). Companies that engage in PBC need to go through re-structuring both internally and externally (Datta & Roy 2013). For example manufacturing firm's structure is traditionally relying on products,

and where the service aspect cannot be added on top of but rather requires changing the whole structure and thinking of what is being offered (Brax 2005). In some cases, the cost of changes in organizational structure can outweigh the benefits of PBC (Gruneberg et al. 2007). Ng et al. (2013) identify that performance-based contracts also challenge the boundaries of each department, making it difficult to tell where the line between management and operations is and where each department begins and ends.

Lack of effective integration, information and alignment

According to Liinamaa et al. (2016) the design of performance-based contract as well as commercializing the joint value creation model are barriers that require unraveling (Liinamaa et al. 2016). More precisely, the lack of effective integration and information between the supplier and buyer organization (Liinamaa et al. 2016) and effective sharing of resources between the parties are often the root causes of barriers in PBC (Ng & Nudurupati 2010). For example, different departments can have negative perceptions among internal customers, which further negatively affects the company's ability to successfully integrate and share resources together with the other party (Liinamaa et al. 2016; Meehan et al. 2017).

Surprisingly many companies also struggle to realize their desired outcomes or true needs, making it more challenging to cooperate (Sols & Johannesen 2013). Buyer and supplier can also struggle to align interests, often because buyers tend to think what end customers want instead of actually asking them, which further leads to contradicting expectations (van der Valk & van Iwaarden 2011). Besides integrating the buyer and supplier, coordinating the supplier's suppliers and what their roles are in the new role system is identified as a challenge (Ng & Nudurupati 2010; Kleemann & Essig 2013), and especially in triadic relationships the subcontractor or other intermediary party can feel role stress when trying to adjust its service to meet the needs of other parties (van der Valk & van Iwaarden 2011). Also, conservative behavior can diminish the likelihood that PBC would succeed (Howard et al. 2016). In general, the parties' unawareness of PBC together with their fear over long-term commitment also affects negative their willing to engage in it (Gruneberg et al. 2007). If the cooperation lacks the contextual understanding of PBC and interest alignment already in the first phase, the cooperation is hardly ever going to succeed (Ssengooba et al. 2012; Kleemann & Essig 2013).

Opportunism and double moral hazard

Both buyer and supplier need to be engaged in cooperation in order to create value effectively and thus one challenge is how to efficiently optimize both parties' systems together instead of optimizing them separately (Ng et al. 2009). Double moral hazard arise from the fact that neither supplier nor buyer's accomplishments are directly measurable and observable (Roels et al. 2010). Thus, engaging both parties equally can be challenging, since both have the possibility to act opportunistically: buyer can pretend that they are not satisfied with the result and the supplier can charge for additional services (Homburg & Stebel 2009) or misuse the information about buyer's equipment (Hypko et al. 2010B). Buyer puts a lot effort on the cooperation only when the supplier's effort is high and vice versa (Roels et al. 2010). For example Brax (2005) found in her study that the supplier had acted opportunistically towards the buyer, due to challenges in communication. Both buyer and supplier also need to keep in mind that disruptive and opportunistic actions do not only end the relationship but can also negatively affect the reputation of the company, especially if the markets are transparent, which to some extent can decrease the opportunism (Homburg & Stebel 2009).

Contract design and management

In general, contract management is often complex and costly, since taking together buyer and supplier in design, implementation and monitoring contracts requires variety of resources (Brown & Potoski 2003). However, it is crucial function linking contract design to avoid possible shortcomings of the written contract (Nullmeier et al. 2016) and to minimize the attributability-related challenges (Selviaridis & Norrman 2015). Sumo et al. (2016) agree to this, stating that there is a difference between the supplier autonomy agreed on the contract and granted autonomy, which is the actual autonomy achieved during the contract execution. Since the contract management can be seen as a legal problem too (Kleemann et al. 2012; Glas & Kleemann 2017), including people who are already familiar with contract management or who have specific knowledge of the product or service can reduce the imperfections of the written contract, and thus ensure the accuracy of the contract far better than a lawyer would (Argyres & Mayer 2007; Nullmeier et al. 2016).

In contract management, one of the challenges is how to set suitable boundaries for what can and cannot be done under the contract and how to minimize opportunism (Ng & Nudurupati 2010). Consequently, contract management needs to be emphasized and the roles and responsibilities of both parties need to be clearly stated (Sols et al. 2008), together with incentives, KPIs, service co-production and monitoring systems and other relevant factors (Selviaridis & Norrman 2015). Berkowitz et al. (2003) also remind that responsibilities that are considered everyone's responsibilities are often no one's responsibilities. Though contract management and legal aspects seem to worry the parties, the problem seems to be more of a lack of practical experience rather than strict legal regulations (Kleemann et al. 2012).

Relational and resource barriers

In addition to organizational change, both buyer and supplier need to reorganize and reassess the resources and internal processes of organizations (Selviaridis & Norrman 2015). The same applies for triads: though the interest are presumed to be aligned between the buyer and end user, there are variety of reasons why the interests differ (Howard et al. 2016). Meehan et al. (2017) identify myths, mistrust and perceptions of procurement as relational barriers and capacity issues and capability issues as resource barriers. Basically, relational barriers keep the relevant parties who could create value together and engage in value-based approach apart from each other (Meehan et al. 2017). Relational barriers can be the inability of buyer and supplier to agree on suitable reward level (Christianson et al. 2008) or perceived fairness of incentives and attributability (Selviaridis & Norrman 2015). For example in Ssengooba et al. (2012) found out in their study that if companies perceive unfairness, they are more likely to lessen the cooperation which further leads to worse performance. For example contract management, or actually the lack of it, is seen as resource barrier, which often can be alleviated with close cooperation (Meehan et al. 2017). After all, partnership is accordance with PBC (Straub 2007).

By the definition of Randall et al. (2011, 333), PBC is seen "as the ability to create a performance-based focus, align activities, and develop an entrepreneurial (risk accepting) culture". Fliess and Lexutt (2017) contribute to this, stating that complex service businesses, such as PBC, call for specific resources, competencies and capabilities. Employees can also lack these skills, which means that the expected performance target cannot be met (Kumar & Markeset 2007).

People are the most important asset of any organization, and if both parties are not able to fully commit to PBC, PBC initiative is doomed to fail (Sols & Johannesen 2013).

Unpredictability of costs, resources and capabilities

Though the PBC leads to improved quality, the equipment that previously have broken down regularly break down now irregularly so that costs related to the breakdowns are impossible to forecast (Ng & Nudurupati 2010). In other words, as a result of improved performance, breakdowns of equipment decrease causing the unpredictability of costs to increase (Ng et al. 2009; Ng & Nudurupati 2010). Kumar and Markeset (2007) also identify competences and skills also cost drivers for PBC; if skills required are highly specific, they can increase the salary costs that further can become the activity's cost driver. Furthermore, Bol and Moers (2010) note that the benefits received from refining the PBC can lead to increased complexity which further increases the costs and where the benefits might not be able to outweigh the costs.

Similarly, the unpredictability increases since the ability of the buying firm's management to monitor the variety has increased (Ng et al. 2009). To again increase the predictability, the company needs to either cut down the variety or to delegate part of the variety down to lower levels of organization which means giving them more autonomy (Ng et al. 2009). Selviaridis and Norrman (2014) also found out that some buyers are not interested in applying PBC, because offering financial incentives make service more expensive thus increasing the costs. They also state that increased costs that result from better performance are not in line with the cost savings targets companies often have. In addition to costs, the unpredictability of capacity required can lead to underestimation of capacities required to implement PBC and thus PBC should not be attempted prematurely but rather with careful and thorough consideration (Ssengooba et al. 2012).

3 The elements of performance-based contracting

Though there are quite some studies about PBC, most of them do not precisely explain how this new type of contracting should be introduced in practice (Kim et al. 2007; Datta & Roy 2011). Ng and Nudurupati (2010) agree to this, and point out that the complexity of implementation results from the fact that in order to successfully implement PBC, both buyer and supplier need to change their way of thinking; since value of PBC is being created jointly, new roles and responsibilities needs to be adopted. In other words, delivering performance requires different approach than delivering a product (Ng & Nudurupati 2010; Kleemann et al. 2012).

Sols et al. (2007) identify choosing the suitable measures to assess the performance effectiveness and sound incentive system that links payment to performance as the main barriers of the implementation of PBC. Selviaridis and Wynstra (2015) illustrate performance, risk and incentives as interrelated dimensions, which concern especially the design and management of PBCs. Datta and Roy (2011) offer slightly different perspective on PBC, and identify contract definition, supplier's operations strategy, buyer operations strategy and service delivery as aspects that affect the implementation of PBC. According to them, contract definition includes agreeing on incentive systems and performance measures, supplier's operation strategy describes the supplier's organizational readiness, buyer operation strategy describes the co-production of value and service delivery describes the chosen performance measures. Henceforth, this chapter delves into key elements of PBC identified in the literature of what could and should be taken into consideration when introducing PBC in service triads.

3.1 Incentivizing systems

One of the key dimensions of PBC are the incentive systems (Selviaridis & Wynstra 2015). Typical for performance-based contracts is to align incentivizing system so that all the actors benefit if the wanted outcome is achieved (Guajardo et al. 2012; Ng et al. 2013). Receiving a reward from better performance is intuitively appealing and to a certain point, people are willing to do better if they are going to be compensated (Christianson et al. 2008). Mirzahosseinian and Piplani (2011) and Sumo et al. (2016) take a slightly different point of view stating that suppliers

should be incentivized to act according to buyer's needs, which in turn can lead to maximizing returns because of improved sources of performance. Sols et al. (2008) agree to this, stating that the buyer has the main role when it comes to choosing performance targets, measurement metrics and the amount and type of rewards for incentive systems.

Though the incentives play a great role in PBC, the companies should also have an eye for cooperation, especially when it comes to enforcing activities in the beginning of the cooperation (Nullmeier et al. 2016). Sols et al. (2008) also note that the level of incentives should be set so that supplier is encouraged to perform within certain performance frames simultaneously disincentivize to overperform and underperform (Sols et al. 2008). As Selviaridis and Wynstra (2015, 3509) put it "the incentive structure impacts on supplier behavior either positively or negatively during contract management". On the whole, incentive systems should be chosen keeping in mind the contracting goal and should be changed in case it fails to manifest the goal (Kleemann et al. 2012). Similar to performance metrics, the possibility to adjust and change the incentive systems if needed is paramount, since often the impact of incentives on supplier's behavior is only seen at the contract management phase (Selviaridis & Wynstra 2015).

Well-established incentivizing systems are seen critical success factors for PBC (Datta & Roy 2011) and expected to lessen the need for direct monitoring, since it enables better information coordination (Bol & Moers 2010). Hypko et al. (2010B) remind that the possibility to reduce monitoring costs depends on how willing the supplier actually is to act in the buyer's interests. Straub (2007) state that in PBC there is often fixed-price and the incentive, though it might not be feasible in real life; they reveal that at least in construction maintenance, the fixed-price on performance-based contacts is short of flexibility due to the lump sum. For instance in public transportation, the lump sum paid for the transportation company often covers the costs, but it cannot be fully covered with ticket revenue and thus the different subsidies need to be added (Fearnley et al. 2004). Instead of full inspections of performance, PBC also allows buyer to check occasionally the performance, thus alleviating the pressure set to supplier (Straub 2007). "Cooperating is linked to enforcing, as the enforcement of performance targets can lead to subsequent adjustments in the information exchange. Goal alignment is facilitated by engaging in enforcing activities" (Nullmeier et al. 2016, 33). Surprisingly, Benzer et al.'s (2014) study found

out that when the performance has reached its high level incentive systems can be reduced or even removed without having severe impact on the future performance level.

What is the performance then compared to? Christianson et al. (2008) state that incentives can be based on predetermined benchmarks, however these pose some problems to the buyer. Other possibilities would be to compare the performance to a particular year or the previous year, however these also have some downsides (Fearnley et al. 2004). According to Sols et al. (2007), historical data from previous years should work well as a basis for measuring future performance. Historical data is used to set the normal level of performance and of which is to be adjusted regularly when new data becomes available (Sols et al. 2007). For example in Fearnley et al.'s (2004) study on public transportation, three types of subsidies are suggested based on which the performance can be assessed: 1) passenger-related subsidies, 2) kilometer-related subsidies and 3) seat-related subsidies. All the three subsidies are interrelated when it comes to the number of passengers and hence, there can be more than one possible combination of optimal service level. In public transportation all the combinations that could work in theory, to achieve the optimal service level, do not work in practice (Fearnley et al. 2004), which needs to be kept in mind when optimizing the service level. Fearnley et al. (2004) for example remind that the ticket prices cannot be raised remarkably because of the regulation thought they technically could contribute to optimal service level (Fearnley et al. 2004).

Pricing

Complex services often require more advanced pricing methods compared to traditional fixed-price methods, where the supplier is given incentive to reduce the costs or improve the performance in order to be rewarded (Glas et al. 2011). Generally, in performance-based contracting the payment for the supplier can be based on fixed-price, cost-plus or purely performance-based pricing (Kim et al. 2007; Collins-Camargo et al. 2011). Datta and Roy (2013) also add cost-reimbursement contracts between cost-plus and pure PBC. In fixed-price the idea of incentive system is to mutually agree on a lump sum for supplier for a level of performance (Kim et al. 2007; Kindström & Kowalkowski 2014), and if the supplier is able to reach it with lower costs that expected, the saved costs become profit for supplier (Randall et al. 2011). Fixed-price pricing can be measured based on output or effort (Roels et al. 2010). Fixed-price is seen to be

highly motivating for suppliers (Kindström & Kowalkowski 2014), since if the costs are higher than expected, the profit marginal of supplier decreases (Randall et al. 2011).

Cost-plus pricing on the other hand is in between the fixed-price and pure performance-based pricing. In cost plus, the buyer pays supplier certain fixed-price and a premium, depending on the performance level achieved (Kim et al. 2007). According to Selviaridis and Wynstra's (2015) study, most of the studies of PBC pricing are related to cost-plus pricing. In turn, in pure performance-based contracting the suppliers' compensation is fully tied their performance (Kim et al. 2007). Hence, if the supplier is only paid when a certain performance level is reached, the motivation is at its highest, since the supplier aims to maximize its profit rates (Kleemann et al. 2012; Xiang et al. 2017). Tying the pricing together with performance motivates the supplier to discover new ideas and to innovate to avoid costs in the future (Kleemann et al. 2012).

According to Bonnemeier et al. (2010) traditional pricing methods, fixed-price and cost-plus models, have only one parameter that is measurable: supplier's effort. Contrary to these traditional pricing methods, PBC is seen as an innovative pricing model (Bonnemeier et al. 2010). Caldwell et al. (2009) agree to this by reminding that compared to traditional contracting, performance-based contracting does not have market prices on performance as there are for example catalogs for products. In some cases, combining fixed-based pricing to performance-based component works better than purely using only one pricing method (Kim et al. 2007). Furthermore, PBC enables the use and further focuses on value-based pricing (Liinamaa et al. 2016). Contrary to traditional fixed-price models, advanced performance-based contracts are non-standard and challenges the expectations of the roles in the markets and traditional value allocation patterns (Liinamaa et al. 2016). Bonnemeier et al. (2010) also state that if suppliers are able to make their services transparent enough, PBC should motivate buyers to purchase more.

3.2 Managing risk and uncertainty

Gruneberg et al. (2007, 692) define risk as "a combination of the three factors of probability, magnitude and frequency" and when understanding these factors companies can better adjust their actions towards the risks. Though it might seem that PBC only benefits the buyer and the

supplier only receives risks, this is not the case (Eldridge & Palmer 2008; Hypko et al. 2010B; Guajardo et al. 2012). Both parties need to invest in beyond financial terms and agree on PBC design, performance metrics, rewards among other essential specifications (Datta & Roy 2011; Holmbom et al. 2014). Supplier's increased financial risk can also be seen as a benefit, since it increases supplier's responsiveness and freedom (Roels et al. 2010).

Even though supplier bears significant financial risk (Martin 2007) and its reward is dependent on the performance level achieved (Holmbom et al. 2014), the risk concerning the performance is also shifted from the supplier to buyer to some extent (Ng et al. 2013; Howard et al. 2016). However, some costs can be shared (Ng et al. 2013), incentive systems designed and performance monitored targeting to minimize opportunism (Greiling 2006). According to Kleemann and Essig (2013), the supplier can decide if it wants to bear the whole risk itself, share it with its own suppliers or refuse to engage in PBC because of the risk. Furthermore, the supplier's willingness to take risk also affects the amount of risk it is able to transfer to its own suppliers (Selviaridis & Norrman 2014). According to Datta and Roy (2013), it is not clear how much of the supplier's risk is being transferred to sub-suppliers or along the supply chain, but Selviaridis and Norrman (2014) found out that sub-suppliers are rarely willing to bear such risk, because they are not able to acquire the incentives either. Due to the shift of risk and shared costs (under these circumstances), under long-term, the firms are encouraged to improve the design of the products and make the maintenance and repair processes more efficient to improve the profitability (Ng et al. 2013).

PBC is more common when the cost uncertainty is low (Kim et al. 2007) and when the output is correspondingly dependent on both parties' efforts (Roels et al. 2010). Datta and Roy (2011) further elaborate this by stating that supplier should be prepared for additional investments and improvements to guarantee performance. According to Martin (2007) suppliers' financial risk grows also when the supplier is rewarded is based on only performance. To align the interests of supplier and buyer, the incentivizing systems are needed, and they often take place when the performance needed is complex (Caldwell & Howard 2014). Hence, it can be said that the financial risk for supplier often goes hand in hand with remuneration.

PBC relies on the idea that "the greater the risk, uncertainty and complexity the greater the level of incentive required to ensure successful completion of tasks" (Berkowitz et al. 2003, 47). In addition to rewarding incentive systems, companies can also use negative incentivizing systems to penalize if certain service level is not reached (Berkowitz et al. 2003; Eldridge & Palmer 2008), since low performance can automatically affect the satisfaction of the end-customer (van Mossel & van der Valk 2008). For example, train operators in some countries are penalized if they perform poorly on punctuality (Fearnley et al. 2004). Of course penalizing should not increase the perceived risk for the supplier, and thus the incentivizing systems cannot be negative (Fearnley et al. 2004). Incentives that were not seen or thought beforehand might also arise when implementing PBC (Shen 2003). Anyhow, performance needs to be defined, measured and monitored so that rewards and penalties are justified (Collins-Camargo et al. 2011), if the supplier's performance exceeds or fails to meet the target performance level (Sols et al. 2007).

In complex services offerings, shifting the risk and responsibility to supplier often leads to the increase of outcome uncertainty (Datta & Roy 2013; Nullmeier et al. 2016). To balance this uncertainty, which often is a result of insufficient information and inability to affect external conditions (Hypko et al. 2010B), the buyer needs to be involved and committed in the contract management (Nullmeier et al. 2016). Besides, agreeing on incentive systems and further introducing and communicating them can be demanding (Sols et al. 2007; Christianson et al. 2008; Selviaridis & Norrman 2015), since maintaining these systems is costly and setting incentive threshold on a suitable level to motivate the supplier is challenging (Sols et al. 2007; Caldwell & Howard 2014; Selviaridis & Norrman 2015). Due to the complexity and dynamism of PBC, the performance requirements also need to be flexible and therefore maintainability and supportability should be included (Sols et al. 2007). In other words, suppliers optimize their processes and products guaranteeing the performance level and thus ensuring that buyer receives a product that fulfills or even exceeds the expectations.

Furthermore, Ulaga and Kohli (2018) identify need uncertainty, process uncertainty and outcome uncertainty as factors that often arise related to performance-based solutions. To minimize the uncertainty and optimize the performance outcome of the solution, the flow of essential

information needs to be ensured and to support the buyer to adapt and engage in the new cooperation model (Ulaga & Kohli 2018). Here, the sales personnel play a great role, since they work in the interface of the buyer, supplier and end-customer and should identify and take actions if the buyer and supplier are not able to meet the end-customer's needs (Ulaga & Kohli 2018). On the other hand, although the new performance-based model brings benefits and boost the business, adopting to new cooperation model can negatively affect the short-term performance metrics (Ulaga & Kohli 2018), since the benefits of PBC can be obtained throughout the contract period (Holmbom et al. 2014). Generally speaking, when the incentivizing system is highly motivating and the expected costs related to risk are low, the companies find it easier to adopt the PBC at an early stage (Bol & Moers 2010).

3.3 Design of performance-based contracts

Eldridge and Palmer (2008, 161) illustrate the core idea of PBC by stating that "The dilemma for the principal is how best to design a contract that will motivate the agent to behave in the way that they desire, even when they cannot fully monitor what the agent is doing". In turn, Mouzas (2016) states that performance-based contracting aims to align the performance targets for both parties, because both parties aim to balance their need for certainty and ability to forecast future performance simultaneously being able to innovate and otherwise be flexible. Nevertheless, the contracting parties can have very diverse interpretation of the contracts, and thus a lot of negotiating in required (Caldwell et al. 2009).

When it comes to designing the performance-based contract, the features of the service in question and the features of the relationship between the contracting parties affect the contract type chosen (Homburg & Stebel 2009). Of course, optimizing the design of the contract aims to ensuring that the contract mechanism is financially viable for both parties (Ng et al. 2009), and simultaneously minimize opportunism (Nullmeier et al. 2016). Tate et al. (2010) also note that in triads, one of the actors can indeed act opportunistically if the contract is not designed carefully. However, Kleemann et al. (2012) remind that though performance-based contracts are most likely more complex than traditional contracts of individual transactions, the number of individual contracts is reduced remarkably. In other words, combining previously individual

transactions to one contract clearly makes the contract more complicated but allows the parties now to assess it as one entity.

Mouzas (2016) represents (contractual) effectiveness, efficiency and risk as aspects based on which's combination the overall performance (of the contract) can be analyzed. Technically, maximizing all the three aspects simultaneously would lead to superior performance, but unfortunately in practice this highly unlikely (Mouzas 2016). For example, when the contract emphasizes the performance of high efficiency and low risk, it does it so at the expense of ignoring innovation (Mouzas 2016). Especially the willingness to tolerate risk affects what type of contracting and pricing the parties engage in (Hooper 2008). This alignment together with the solution design should be already done in an early stage, such as contracting, since otherwise it might put the whole cooperation project in danger (Aarikka-Stenroos & Jaakkola 2012). In other words, the smoother the cooperation between buyer and supplier already from the beginning, the better the contract performance, at least in theory (Ng et al. 2013).

Including both suppliers and sub-supplier from the beginning and ensuring joint communication channels and information flow allows the trust, mutuality and alignment to grow between the parties (Pinnington et al. 2016) thus leading closer to the maximum benefits of PBC (Kleemann & Essig 2013). Compared to contracting products or simple services, the PBC requires the contracting parties to interact and communicate regularly (Homburg & Stebel 2009; Kleemann & Essig 2013; Pinnington et al. 2016), to ensure that both parties are on the same page. Nevertheless, suppliers are not always able to convince sub-suppliers to engage in PBC, thus challenging alignment and success of the whole supply chain (Kleemann et al. 2012). Compared to dyads, van der Valk and van Iwaarden (2011) questions the importance of contractual alignment in triadic relationships, since their study found out that triads can do business effectively though there would be no formal contractual alignment. This is surprising, since Tate et al. (2010) highlight in their study that deciding suitable contractual arrangements together with internal alignment is crucial in triads.

When purchasing complex services, the parties often aim to reduce the complexity and risk of contract failure by designing more precise contracts with clear roles (Brown & Potoski 2003;

Argyres & Mayer 2007). Hensher and Stanley (2008) remind that though contracts in theory could cover all the relevant aspects with no faults or misinterpretations, this in practice is not possible. They also point out that highly complex contract often increase transaction costs, since ensuring the compliance is expensive and can lead to budget eruption. These complex contracts and transactions related to them emphasize the importance of appropriate contract design that supports solving problems together and targets value creation (Argyres & Mayer 2007).

In turn, incomplete contracts require negotiations, which further enable both parties to propose changes and thus increases transparency (Hensher & Stanley 2008). Here, transparency is one of the key feature of PBC, and it should offer full visibility for the whole contract (Datta & Roy 2011). Besides, contracts are often seen as a means to renegotiate and adjust the cooperation, they are often less detailed and rely on self-enforcement rather than legal enforcement or a list of strict obligations (Hooper 2008; Mouzas 2016). The contracts should include operational instructions and procedures only if there is not enough information available for contracting parties to take care of their responsibilities themselves (Buchanan & Klingner 2007). However, it is good to keep in mind that the markets and industries can vary greatly, and thus incentives and contracts need to be customized (Berkowitz et al. 2003) to meet the needs of each market and industry (Fearnley et al. 2004), and that the contracting parties can also decide beforehand how precise contracts they want to negotiate (Hartmann et al. 2014). Besides, cooperation evolves with time, and the longer the parties work together, the more they are able to modify the contract to fit the real situation and needs (Argyres & Mayer 2007).

The work does not end when the contract itself is ready, but extends to cover the contract implementation and management too. Change is fundamental to PBC (Randall et al. 2015) and during the implementation process the strategy, contract details and compensation mechanism should be assessed regularly and if necessary, adjusted to current needs (Kumar & Markeset 2007; Kleemann et al. 2012). Also the value the contract aims to target should be kept in mind during the whole contracting time (Pinnington et al. 2016). Performance requirements and contractual aspects are likely to evolve during the lifecycle of the service (Datta & Roy 2013), and there are inevitably details or circumstances that were not seen beforehand, or something so complex that it could not be described in the contract with sufficient detail (Hensher & Stanley

2008). By adjusting the contract during the process, the possible gap between required performance and delivered performance can be minimized (Kumar & Markeset 2007). Luckily, companies learn and their contract design capabilities improve as the people taking part in contract design learn to better deal with these trade-offs (Argyres & Mayer 2007).

The contracts between buyer and supplier are often optimized so well commercially, that no further improvements can be made (Meehan et al. 2017) and thus the approach to the contracts and cooperation need to change to better meet the needs of both parties. Nevertheless, this does not mean that the PBC ignores the need for cost reduction, but rather gives priority to contextualized, temporal and multifaceted cost reduction (Bonnemeier et al. 2010; Meehan et al. 2017). Rather than concentrating on minimizing the supplier's costs, the concentration is steered towards the value for the buyer (Bonnemeier et al. 2010). On the other hand, launching PBC aiming at long-term cooperation in itself is seen beneficial, though also relatively costly (Straub 2007).

The value created in close cooperation can either benefit or suffer depending on how well the parties are able to diagnose needs, design and produce the wanted performance level and how well possible value conflicts are managed (Aarikka-Stenroos & Jaakkola 2012). Ideally, the parties need to agree upon what are each actor responsible for and what are their tasks, and state it clearly on the contract (Straub 2009), rather than tying the tasks to mutual contributions (Roels et al. 2010). However, defining the specific roles of each party can be challenging, because in-depth knowledge of the technologies and know-how are often required to give detailed description (Argyres & Mayer 2007).

In addition, Aarikka-Stenroos and Jaakkola (2012) found out that if there is a trust-based relationship between buyer and supplier, the supplier may be able to even expand their service proposal and thus increase the value rather than making buyer to feel that they are being pushed by extra sales. Glas et al. (2011) note that cooperation between parties relies on contractual basis but can also take a form of strategic partnership. Albeit Glas et al. (2011) opinion, Sols and Johannesen (2013) argue that PBC requires partnership between the parties and causing either

both to succeed or fail. Especially in short-term contracts the level of trust and reputation impact the amount of control needed in the contract (Homburg & Stebel 2009).

Low term specifity enables supplier autonomy, which is also found to affect positively supplier innovation (Sumo et al. 2016). Therefore, since low term specifity is characteristics to PBC, it can be deduced that PBC can support supplier innovation. However, according to Sumo et al. (2016), the supplier has to be granted autonomy in the execution of contract phase which, surprisingly, might not be as easy as thought, especially if the parties are used to precise contracts. Giving supplier autonomy and open systems decreases the firm's predictability and thus might be challenging for the firm to grant such power (Ng et al. 2009). Besides, sharing knowledge between firms especially in long-term relationships improves the level of communication (Mouzas 2016) and the new model has obliged the contracting parties to re-evaluate their communication methods (Gates et al. 2004).

Nullmeier et al. (2016) also indicate that the literature about PBC shows that the outcome uncertainty arises from sources in the external environment, rather than internal environment. Contrary to this, Nowicki et al. (2010) identify factors such as processes, operating profiles, maintenance philosophies and logistic footprints among others that can and are likely to change over long term, and which are more part of companies internal environment rather that external environment. On one hand, buyer's role in PBC lessens the attributability of performance outcomes to suppliers, but on the other hand, with the buyer's contract management actions the disadvantage of lessened performance attributability can be deliberately avoided (Nullmeier et al. 2016).

Moreover, contract management should be wholly or partly the responsibility of the operational departments instead of solely relying on purchasing department (Nullmeier et al. 2016). A company that wishes to introduce PBC in their business can form a check-list with drivers and barriers to see whether it is feasible to shift to PBC (Visjnic et al. 2017). On the other hand, the identified value drivers can be used as basis to form optimal performance-based contract, where the key value drivers are emphasized and value loss drivers are mitigated (Visjnic et al. 2017).

When it comes to contract management, the buyer needs to monitor, enforce, coordinate and cooperate the contract and contracting parties (Nullmeier et al. 2016).

Caldwell and Howard (2014) state that private market firms who act in a limited markets have the possibility to be flexible with the contracts, and adopt new contractual arrangements when the situations change. Hypko et al. (2010B) found that manufacturing companies are relatively reluctant to use PBC, because of the risk transfer from buyer to supplier. Roels et al. (2010) also remind that service characteristics, e.g. output and input measurability, uncertainty and value enhancement opportunities affect the optimal contract selection.

Governance

Kumar and Markeset (2007) found out in their study that several companies measure and monitor the performance of their suppliers, buyers and within the firm by for example arranging meetings regularly, using different feedback systems and visits to buyer's/supplier's sites. However, only a part of companies had set up systematic and precise systems to measure the performance (Kumar & Markeset 2007), maybe partly because monitoring is often very costly for the company (Brown & Potoski 2003). Though it would be expensive for company, these formal control mechanisms such as specific contracts mitigate the risk of moral hazard and other contracting risks (Caldwell et al. 2009). Brown and Potoski (2003) identified four activities that can be seen as formal control mechanisms: monitoring complaints, distributing regular satisfaction surveys, assessing supplier performance data and setting strong incentives to report when performance is lower than expected. Visiting supplier's site is identified as one monitoring method since it requires only little technical knowledge, though the downside is that it's relatively costly (Brown & Potoski 2003). It is interesting to note that for example Bol and Mayers (2010) state that due to the shifted risk, the buyer could (and should) decrease supplier monitoring, however Kumar and Markeset (2007) remind that buyers can justify their monitoring by entreating for making sure that the used strategy complies with set requirements. This evokes the need for parties to agree to what extent the monitoring from the buyer's side is needed.

Formal control mechanisms are not the only way to monitor supplier performance, but informal control and monitoring mechanisms such as trust and mutual commitment also play a great role

(Caldwell et al. 2009). For example van der Valk and van Iwaarden (2011) found out that relational governance and social contracts are more effective than contractual governance and formal contracts in triadic relationships. Besides, Brown and Potoski (2003) remind that if the service produced is highly complex, there is no guarantee that current contract monitoring activities would be sufficient to assess the performance, but new monitoring activities may be needed.

3.4 Drivers and antecedents of PBC

As Liinamaa et al. (2016) noted in their study, the PBC process starts with identifying and defining the problem; in their case the company had difficulties capitalizing the value of their offering and lack the necessary selling methods. To their opinion, and which fits the idea of abductive case study, the contract design and development processes were iterative processes between the current best practices from the literature and the real situation (Liinamaa et al. 2016). To succeed in the iterative process and further effectively introduce PBC, both the buyer and the supplier should have two interconnected capabilities: contractual capabilities and relational capabilities (Hartmann et al. 2014). According to Hartmann et al. (2014) contractual capabilities refer to the parties' capability to understand the needs of PBC and convert those to contractual means, whereas relational capabilities focus on the relationships between and within the parties, highlighting the importance of trust. The buyer's ability to access and handle the previous data can be seen as a contractual capability: the better the buyer makes use of the historical data, the more accurate the set performance metrics are (Selviaridis & Normann 2014). Additionally, buyer's contractual capabilities are their ability to rationalize supplier base (Howards et al. 2016) and the ability to estimate the costs and wanted performance, just to name a few (Tineo 2007).

To familiarize oneself closer with relational capabilities, high level of trust is expected especially in triadic relationships, since in triads the value propositions are first created jointly (Nätti et al. 2014), and then coproduced jointly (Ng et al. 2009). For example, van der Valk and van Iwaarden (2011) present that an organization can pay for its supplier to deliver service directly to the end customer or by the premises of the end customer. This requires trust towards all the parties and that they are able and willing to meet the expectations, though supplier and end

customer might not directly be contractually bound to each other (van der Valk & van Iwaarden 2011). Thus, building trust, commitment, communication and knowledge of value are identified as the keys to successful PBC and hence should be the target for all the parties involved (Randall et al. 2011; Nätti et al. 2014). This alignment of behavior and information between the parties has positive affect the contracting performance (Ng et al. 2013) and hence, mutual trust, commitment and other soft factors should be strived for (van der Valk & van Iwaarden 2011). Nevertheless, the actors can have their own objectives which can contradict (Tate et al. 2010; van der Valk & van Iwaarden 2011), and for example cost reduction and price are often buyer's main objectives whereas the end customer is often mainly concerned about the service quality (van der Valk & van Iwaarden 2011).

In PBC, frequent communication within triadic relationship is vital, and it is seen as a tool to respond to the concerns of the parties (Salo et al. 2009). According to Choi and Wu (2009), the complexity of the relationships is better understood and better relationship-related decision can be made under a triadic approach. However, if the parties feel that some party has more control over the cooperation, it can mediate the alignment between the parties (Ng et al. 2013). For example, if the supplier perceives buyer's control too dominant, they might be more reluctant in finding the alignment with the buyer. Salo et al. (2009) study also gives hope for companies whose relationships are not at their best, since they show in their study that even damaged relationships can be restored as well. The virtue behind identifying needs, expectations and prerequisites for cooperation lies in the fact that "even though business relationships are built between companies, they always rely on the engagement of the people acting on behalf of the companies" (Salo et al. 2009, 630).

Critical to cooperation is to understand how the value is created as a result of the cooperation processes, and furthermore how this understanding can be used to manage the relationship (Ng et al. 2013). Both parties also need to understand that working closely together holds much more potential for both parties instead of the traditional situation where both parties try to maximize their own outcomes (Ng et al. 2009). Ng et al. (2013) also remind that neither firm is able to realize the drivers by themselves, but that the value is created jointly in processes of which both contribute to. Visnjic et al. (2017) agree to this, by showing that the closer the suppliers are to

the buyers, the better latent needs are understood and more effective solutions can be built. In turn, Randall et al. (2011) emphasize the importance of the byer organization's managers and their ability to be innovative and promote entrepreneurial behavior, trust and safety. In other words, the closer the actors work, the better the communication and level of trust between the actors are and the better their managers are, the more likely they have the required drivers to engage in PBC.

While the literature seems to identify beneficial capabilities for PBC and what should be taken into account before the contract is signed, only little or no literature has been written about the perceptions or reactions of the actors involved. It is surprising, since the enablers are proven to have a direct positive effect on the success of PBC implementation (Devries 2005). Altogether, it is crucial to identify these perceptions, capabilities, expectations and prerequisites, since those can be seen as enablers or barriers to PBC. Devries (2005) also identified performance metrics, incentives and partnership among others as the most common enablers of PBC. Hence, by identifying the enablers and barriers, the companies are able to tackle the barriers and have realistic and clear vision of the contracts, further enabling the implementation of the contract so that it is likely to succeed.

4 Methodology

Qualitative embedded single case study was chosen as the method for this study, because current studies of both PBC and triads are frequently qualitative case studies (Martin 2007; Selviaridis & Wynstra 2015; Sengupta et al. 2018). Embedded single case study studies a phenomenon (the unit), where there are multiple layers (subunits) within a single case (Scholz & Tietje 2002; Yin 2018). Embedded single case study thus goes in parallel with the research setting, where the main unit of the study is the triad, and the different subunits are the actors of the triad.

Halinen and Törnroos (2005) state that case research can offer a multi-sided view within its context, and thus enable close examination and further rich description. Due to the triadic approach, the study benefits from the ability to take profound multi-sided, or in this case three-sided perspective, on the situation and encapsulate the perceptions, expectations, barriers and goals of each actor. Transition from procuring products to procuring complex performance affects variety of people, enabling rich descriptions and delving into the topic, thus supporting the selection of case research as the most suitable research method. Case research is often used to study contemporary phenomena (Halinen & Törnroos 2005; Eisenhardt & Graebner 2007; Yin 2018) over which the researcher has no control and where the boundaries between context and phenomenon might not be visible (Yin 2018). Here, transition process from one contracting and pricing model can be seen as a contemporary phenomenon, further strengthening the method selection.

In general, case studies can be divided to single case studies and multiple case studies based on the amount the cases in the study (Dubois & Gadde 2014; Yin 2018). For this study, single case study was found suitable, since the triad can be seen as a unit, a small network with interdependent relationships. In the network, where some have stronger ties than some others, and within the triad, they form multiple dyadic relationships making triadic approach more complex than the dyadic approach (Howard et al. 2016). Besides, single case studies enable examining and deeper understanding of a situation or phenomena under often extraordinary circumstances (Yin 2018). In other words, the idea is to go deep into the triad and identify the characteristics of this one of a kind phenomenon. Furthermore, Vedel et al. (2016) identify that taking a triadic

approach is helpful for researchers conducting a case study and thus embedded single case study with triadic approach is seen suitable.

The main outcome of a case study is not necessarily to create generalizable and universal theories, but rather to improve context-specific understanding of a phenomenon (Dubois & Gadde 2002; Halinen & Törnroos 2005; Easton 2010; Hirsjärvi et al. 2009; Järvensivu & Törnroos 2010), often under circumstances that deviate from normal (Eisenhardt & Graebner 2007; Yin 2018), are new to the research or where the research is inadequate (Eisenhardt 1989). Hence, the idea of the study is not to offer precise one-size-fits-all guideline on how to move towards PBC, but rather offer closer look on this particular situation, and based on which decisions in the case companies can be made in the future. If the goal would have been to understand "the bigger picture" and to find generalizable results, multiple case study would have been chosen (Dubois & Gadde 2014). Besides, single case studies can offer a great opportunity to examine unusual yet significant phenomenon (Eisenhardt & Graebner 2007). PBC in forest industry can be seen as significant, since the slow-moving industry is believed to be revolutionized with the effective introduction of the new contracting model. All in all, compared to mainstream deductive research, case studies offer theory-building approach from vast amount of rich empirical data which often leads to theory that is precise and reflects the real situation (Eisenhardt & Graebner 2007).

While most of the literature takes dyadic approach to study supply chain relationships (Selviaridis & Norrman 2015), the less known triadic approach might be more feasible, since it enables examining the relationship between parties involved in supply chain and how kind of network dynamics work (Nätti et al. 2014). As Wynstra et al. (2015, 2) put it "triads provide a critical context to better understand the nature and relative importance of various inputs for the service process". Lately, especially interconnectedness, relationship between the actors and contracting have received attention (Sengupta et al. 2018). In Nätti et al. (2016) study, triadic approach was also the most suitable approach, since all the three parties taken under examinations were interested in value co-creation. Besides, examining triadic relationship is interesting because the triad composes from at least three dyadic relationships between the actors creating a network of relationships, and thus provides more powerful tool than only examining dyadic

buyer-supplier relationships (Nätti et al. 2016). These dyadic relationships between parties consist of flow of service, information, money, social and relational elements and knowledge among others (van der Valk & van Iwaarden 2011).

Abductive approach

Here, the methodological choice was abductive approach, and the data collection and analysis were done based on the abductive principles (Dubois & Gadde 2002). In abductive approach, there are some preconceptions within the framework of the case, but the researchers should go back and forth between the theory and empirical evidence during the whole research process in order to better understand both (Eisenhardt 1989; Dubois & Gadde 2002; Van Maanen et al. 2007; Tavory & Timmermans 2012). As Eisenhardt (1989, 541) state, "the central idea is that researchers constantly compare theory and data—iterating toward a theory which closely fits the data". Abductive approach allows matching often unusual findings into explanatory framework (Tavory & Timmermans 2014) or as Dubois and Gadde (2002, 555) put it, it "stems from the fact that theory cannot be understood without empirical observation and vice versa". Tavory and Timmermans (2012) argue that abductive approach should be the primary way of constructing theory based on empirical evidence. Furthermore, van Maanen et al. (2007, 1149) state, "abduction assigns primacy to the empirical world, but in the service of theorizing". Hence, where using deductive approach to test the theory, relevant aspects arising from the empirical findings could be missed, and thus the going back and forth between the theory and empirical data is found more useful. Strictly speaking, abductive approach is the only logical approach that allows research to generate theory based on data (Tavory and Timmermans 2014) rather than theory-driven research and thereafter test it (Järvensivu & Törnroos 2010).

Abductive approach is seen beneficial especially if the study aims to discover something new, such as new variables or relationships, instead of solely supporting already existing theories (Dubois & Gadde 2002). Abductive approach aims to context-specific explanations (Dubois & Gadde 2014) with situational fit between the theory and the empirical evidence (Tavory & Timmermans 2012). For example, potential barriers to PBC were identified first from the literature, and then from the empirical evidence and then these two were compared to each other. In this case, some of the barriers identified in the literature were supported, yet some had received

clearly less attention or were totally novel to the literature. In other words, the empirical findings are reflected to the previous literature and the possibility to identify unintended findings enables to further contribute to the theory.

Besides, the better the researchers know the theoretical background, the better they are able to identify abductive possibilities and address those (Tavory & Timmermans 2014). Hence, broad understanding of the current literature served as a basis for the research, and the literature was returned during the empirical process allowing the comparison between the theory and the empirical evidence, aiming to find unanticipated discoveries from both ends. However, knowing the literature by heart can also be seen as a disadvantage, since having excessive amount of information about the research topic can also narrow down the researcher's perspective and lead to bias in prior hypothesis (Gioia et al. 2013). Despite this fact, PBC literature is seen so irregular with contradictory findings, that this is not seen as a threat. And not to make it too easy, Järvensivu and Törnroos (2010) remind that it is insufficient to identify that the research process is abductive, but rather the level of abduction needs to be defined more precisely. Therefore, the challenge in abductive approach is to expand the case without losing the methodological or theoretical standards (Tavory & Timmermans 2014). For these reasons iterating between the empirical evidence and literature, abductive approach is believed to offer novel and valuable insight on the limited theory of PBC in service triads.

4.1 Case description

Embedded single case study with abductive approach was chosen within pulp and paper industry context. The study takes a triadic approach, concentrating on the triad formed by purchasing department, suppliers and mills (Figure 3). Altogether, a purchasing department, eight mills and three suppliers are included in the study. In practice, purchasing department and mills are part of a same company (the buying organization), yet are considered as independent actors in the triad because they have somewhat different perspective, interests and objectives. Contrary to traditional triadic setting where the buyer often works as a "bridge" between the supplier and customer, the service triad is more appropriate here, since the actors are interconnected and

communicate with each other (Wynstra et al. 2015), as illustrated in the Figure 3. Besides, service triad is supported since the mills can be seen as internal customers who are active members of the triad.

The interconnectedness of the actors can be seen in the frequency and type of communication: mills and suppliers cooperate regularly, on a daily or weekly basis, and the suppliers aim to facilitate the operational work in mills. Furthermore, mills communicate with purchasing department regularly, and mills often present their preferred supplier to purchasing department when the end of the contracting period approaches. Purchasing department also suggest new suppliers for mills for trials and takes care of the order process. Purchasing department negotiates the contracts including prices, delivery terms and quality with suppliers.

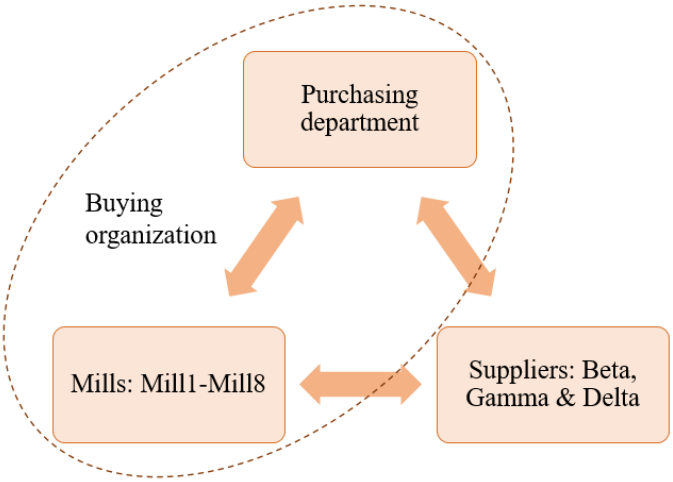

Figure 3. Context framework: Triadic approach

The buying organization, hereinafter referred as Alpha, is a Finnish company operating in forest industry. In 2017, Alpha's sales were worth 10 billion, employing around 19 000 persons and having approximately 90 000 stakeholders all over the world. The company has six business areas, of which one, namely pulp and paper is concerned in this study. To be more precise, paper machine clothing (PMC) category under pulp and paper is chosen due to high spend and interest in re-evaluating the practices that have not changed much during the last decades. The idea of PBC stems from Alpha's purchasing department, which in this study, is considered as one of

the actors of the triad. Alpha's purchasing department has been contributing their supplier management already by concentrating on energy consumption, paper quality and safety at work place, but further wants to improve the running times.

Alpha's suppliers, hereinafter referred as Beta, Gamma and Delta, are chosen based on the amount of fabrics they supply: majority of the paper machine clothing of Alpha comes from these three suppliers. Beta is large international company known to supply pulp, paper and energy industries, with sales being approximately 3 billion euros in 2017. Alpha regards Beta as one of the suppliers they have had the longest relationship with, and see Beta as a traditional paper machine clothing manufacturer. Beta is able to offer full line clothing for paper machines as well as other services. The second supplier under examination is Gamma, a family-owned large technology group operating globally and whose sales were a bit more than 4 billion euros in 2017. Compared to Beta, Gamma seems to invest more in R&D, which can also be sometimes seen in the prices. According to Gamma's interviewees, the company invests in innovation thus targeting the position of technical leadership. Compared to Beta and Gamma, the third supplier Delta concentrates solely on textiles and materials processing and hence is the biggest paper machine clothing supplier worldwide. Delta had sales of approximately 860 million euros in 2017, and to Alpha's opinion, both Gamma and Delta invests in R&D more than Beta does.

The third actor of the triad besides buyer Alpha and suppliers Beta, Gamma and Delta, are Alpha's mills. Alpha has more than a dozen pulp and paper mills all over the world, of which eight were included, six in Finland and two in Germany. Mills are responsible for the operational aspect of Alpha's business and can be seen as (internal) end customer in this case. In pulp and paper industry it is common that mills have the power to organize purchasing according to their own needs, though Alpha in this case makes an exception by having centralized purchasing department.

The Figure 4 presents the relationship between the actors, illustrating that though the approach is triadic, it actually consists of several dyadic relationships between the actors, and of which at least three dyadic relationships are clearly visible (Figure 4). When taking a closer look, the

relationship between the purchasing department and mills is identified relatively close, and purchasing department surveys regularly who are the best suppliers to mills' opinion technically speaking. Mills stated that in most cases, the purchasing department contacts them and the communication is less frequent compared to the communication between the mills and the suppliers.

The relationship between the purchasing department and suppliers mainly consists of negotiating the contracts and other commercial aspects. Again, the communication is frequent when the new contracts are negotiated, but otherwise not so much. Compared to mill - purchasing department and purchasing department - supplier dyads, the communication between the suppliers and mills is the most frequent, consistent and informal, since the actors often meet on a weekly basis. Suppliers and mills work closely together, and their relationship includes discussing the fabrics' technical aspects and measuring the fabrics attributes among other operational tasks. Considering value co-creation roles and relational elements, can the relationships between the parties vary (Nätti et al. 2014); for example supplier Beta may have better negotiation position compared to Delta, since Beta supplies larger proportion of Alpha's paper machine clothing.

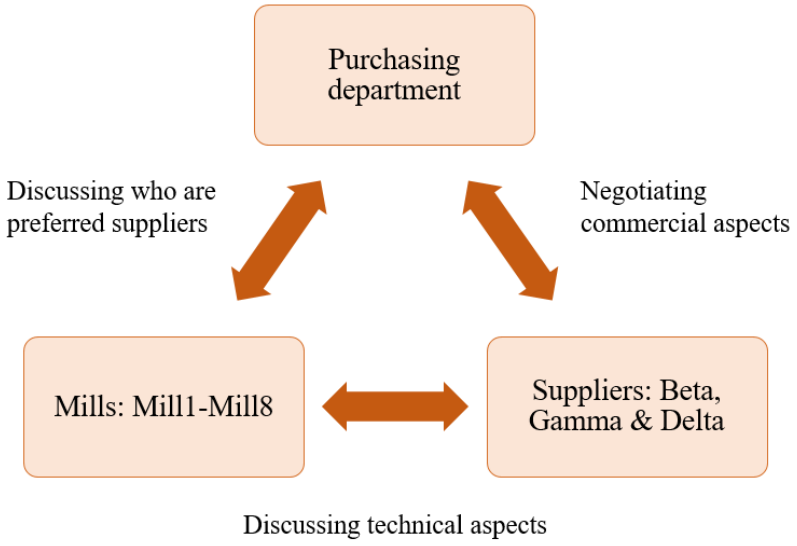

Figure 4. Illustrating the dyadic relationships between the actors in triad

Together with purchasing department's representatives, paper machine clothing has been chosen as the examined category for PBC. Paper machine clothing is seen as a part of production

consumables category, which according to Tuck (2004) is sub-category of maintenance, repair and overhaul (MRO) category. More explicitly, papermaking line consists special textiles, namely of forming fabrics, press fabrics and dryer fabrics which form paper machine clothing (PMC) category (Hakala & Harlin 2010). Hakala and Harlin (2010, 2067) argue that "The tendency of clothing suppliers is to improve the durability of PMC products and to extend their life by creating new textile properties with special materials, and innovative structures and preparation methods". Paper mills and suppliers have already tried to improve the efficiency or paper machine clothing features, resulting in only minor incremental improvements (Shaw 2005; Toppinen et al. 2017). However, all the research on paper machine clothing development seems to be concentrating on physical attributes of either machinery or fabrics, whereas introducing performance-based contracting could offer totally new point of view.

According to the categorization of Tuck (2004), industries that require costly and complex machinery for production, often concentrate on optimizing maintenance, repair and operations (MRO) processes. MRO as a category includes production consumables in and specialty items such as services among others (Tuck 2004). Tuck (2004) identifies three problems that arise if MROs are managed improperly: running out of components, excess inventory and inability to assemble spend and leverage purchasing of MRO. Especially running out of fabrics is one of the biggest risks when it comes to paper machine clothing, though at the same time mills aim to minimize their inventory. Though production consumables seems to be an infrequent term in literature, MRO has been widely studied within PBC literature (e.g. Ng et al. 2009; Ng & Nudurupati 2010; Guajardo et al. 2012; Ng et al. 2013).

Pulp and paper industry

Forest industry, including pulp and paper industry, is known to have high barriers to entry due to the capital-intensive business, and therefore there are only a few companies operating within industry, all sharing strong positions (Alpha's annual report). During the last years, pulp and paper industry has suffered from overcapacity and low profitability, which drives the highly capital-intensive companies to merges and acquisitions (Colclough 2000). Demand of traditional paper has been decreasing over the years, but simultaneously the consumption of paper used in packaging has been increasing, balancing the product levels (Toppinen et al. 2017).

Though the industry as a whole has a low profitability, Andersson et al. (2002) argue that if the company is able to achieve high profitability, they are also able to leverage value. Typical for the industry is to be highly transparent yet conservative, together with cyclical products that are almost always cost-plus priced, causing the whole industry to be anything but value creative (Andersson et al. 2002). However, contrary to all the expectations, some companies have been able to gain high enough profitability to create value for their businesses (Andersson et al. 2002).

Another reason for minimal value creation is that the industry has not been able evolve due to its low innovation intensity (Pätäri et al. 2016; Toppinen et al. 2017). As a result, companies operating in pulp and paper industries should concentrating on developing innovative products, new service concepts and re-think their pricing methods (Andersson et al. 2002). This indeed is more easily said than done since it would require a tremendous cultural change (Kleemann et al. 2012) and the industry is moving slowly (Andersson et al. 2002). PBC prefers long-term contracts over short-term contracts (Kleemann et al. 2012) and which suits the slowly-moving industry like pulp and paper industry well. Nevertheless, there are still companies that could and should escape the commodity trap and re-think their business, contributing to the fact that the future of pulp and paper industry as a whole is seen quite bright (Andersson et al. 2002; Toppinen et al. 2017).

Besides, Asian companies are entering European markets, forcing current actors to invent diverse industrial business models (Pätäri et al. 2016; Toppinen et al. 2017). For example Nurmi (2007) presents that personnel has increasingly large role when it comes to pulp and paper companies' success. Toppinen et al. (2017) believe that in the future, pulp and paper industry will be more effective in terms of resources and energy and occupying diverse product catalog that meets the needs of environmental sustainability. Bearing in mind the PBC norms this far, successful introduction of performance-based contracting can be a long-awaited game changer for the whole industry.

4.2 Data collection & analysis

Researchers seem to agree that case studies can and should include variety of data as sources for their case studies (Eisenhardt 1989; Eisenhardt & Graebner 2007; Piekkari et al. 2010; Yin 2018). Yin (2018) identifies six sources of data: documentation, archival records, interviews, direct observations, participant-observations and physical artifacts. One of the most common practices in case studies is to use interview data together with some other source of data e.g. archival records (Piekkari et al. 2010). This full variety of evidence is one of the case research's advantages compared to other research methods (Yin 2018), since by triangulating evidence theory grounding is being supported (Eisenhardt 1989).

Gathering data from several sources and from different perspectives is identified as one of the best practices of case studies (Dubois & Gadde 2002; Easton 2010; Piekkari et al. 2010), and maximizing the use of different data sources is often beneficial, since the sources are complementary and differentiate a good case from an average case (Yin 2018). For example by observing the situation researchers might be able to recognize unexpected yet relevant aspects that would have otherwise been left out (Dubois & Gadde 2002). For example, taking notes and writing memos while observing and otherwise collecting data facilitate identifying these unexpected aspects (Tavory & Timmermans 2014). Case researchers also often have the ability to be flexible when it comes to data collection and thus these unexpected yet relevant aspects can be included (Eisenhardt 1989; Hirsjärvi et al. 2009).

Eisenhardt and Graebner (2007) point out that when cases describe more extreme phenomenon or relationships, the interviews often work as the primary data source. Like Dubois and Gadde (2002, 555) state "The main objective of any research is to confront theory with the empirical world". Yin (2018, 201) remind that "case study analysis is the most difficult stage of doing case studies" and that there are no "simple cookbook procedures". During the research process, also rival explanations should be addressed and further rejected to support the findings (Yin 2018). In other words, the analysis should be well justified and explain why and how these deductions eventually led to results and why some other methods/results were not carried out.

Since the literature of case studies seems to promote using several sources and triangulation of data, enough relevant sources of data are aiming to be included in this study. Due to abductive approach, the empirical observations and data were examined in contrast to theory, thus aiming to see the bigger picture. Primary source of evidence were theme interviews, of which 25 were held in total. The amount of data gathered from the interviewees is relatively extensive, which is common to qualitative case studies, and which further allow rich descriptions of the situation (Yin 2018). The interviewees represent all the actors of the triad; there were seven interviewees from the purchasing department, 11 interviewees from eight different mills and seven from three suppliers (Table 5). The interviewees were chosen based on who are more or less familiar with the topic yet regarding it from different points of view if possible. To most, the interviewees were only held once, but for two interviewees Category Director (Alpha1) and Sourcing Manager (Alpha2) from purchasing department there was a second interview round. They were interviewed twice in order to clarify previous answers and ask questions that were not evident in the first round yet which enact a noteworthy attention.

Theme interviews were chosen because they enable relatively free discussion about certain topics without asking rigid and limited questions (Hirsjärvi et al. 2009). The interviews were held either face-to-face, via Skype or via phone, and all were recorded and transcribed to facilitate returning to the data afterwards. As a result of recording and transcribing the data, not only the researcher herself but also the reader is able to reconstruct the situation (Tavory & Timmermans 2014) and thus assess the validity of the study.

The interview questions (Appendix 1) were roughly divided to categories aiming to explain and increase the understanding of how performance-based contracts are perceived, expected to look like and help to identify the potential barriers as well as the goals. Interview questions also dealt with cooperation between the actors, and the questions were modified depending on the actor those were targeted at and revised if necessary. Secondary sources of data are observations, documentation and archival records concerning or derived from related events, parties, environment and relationships. The researcher attended for example four Skype meetings of Alpha and Beta and a few internal sourcing meetings in addition to receiving feedback from Alpha based on the presentation of preliminary findings.

After systematically collecting and transcribing the interview data, the data was analyzed by coding the text: the transcriptions were read through and relevant citations were collected and further categorized. Using Gioia et al. (2013) as an example, these categories were further combined to parent categories. This data structure shows how the raw data has been processed, and structuring the data is seen as a vital step to take before the analysis can be assessed (Gioia et al. 2013) (Figure 5). Numerous quotations, in a form of direct quotations and so called proof tables, are provided to make the study more transparent. For example categories like transparency, fear of increased risk, competitive advantage and innovation were identified.

Preliminary findings were also presented and discussed with two Alpha's interviewees in a focus group meeting, which can be seen to contribute to the credibility of the study. As Yin (2018) note, conducting and analyzing case studies often requires experience and help from others and hence, other researchers helped out with the data analysis and shared their insights. Aspects identified from interviews were also compared to observations, and no major discrepancies were found.

Table 5. Data collection: Interviewees.

Position	**Code**	**Role in triad**	**Company**	**Interview held**	**Duration (min)**
Category Director	Alpha1	Purchasing department	Alpha	Face-to-face	71
Sourcing Manager	Alpha2	Purchasing department	Alpha	Face-to-face	80
Buyer	Alpha3	Purchasing department	Alpha	Skype	64
Vice President, Raw Materials	Alpha4	Purchasing department	Alpha	Skype	88
Business Development	Alpha5	Purchasing department	Alpha	Face-to-face	64
Senior Vice President, Sourcing	Alpha6	Purchasing department	Alpha	Face-to-face	87
Senior Specialist	Alpha7	Purchasing department	Alpha	Skype	82
Production Manager	Mill1	Mill	Alpha	Skype	115
General Manager	Mill2	Mill	Alpha	Skype	70
Senior Production Manager	Mill3	Mill	Alpha	Skype	60
Operations Manager	Mill3	Mill	Alpha	Skype	67
Operations Manager	Mill4	Mill	Alpha	Skype	60
Production Manager	Mill4	Mill	Alpha	Skype	57
Operations Engineer	Mill5	Mill	Alpha	Skype	62
Operations Engineer	Mill6	Mill	Alpha	Skype	78
Operations Engineer	Mill7	Mill	Alpha	Skype	79
Engineer	Mill8	Mill	Alpha	Skype	72
Operations Manager	Mill8	Mill	Alpha	Skype	86
Sales Director	Beta1	Supplier	Beta	Face-to-face	80
Sales Specialist	Beta2	Supplier	Beta	Face-to-face	84
Director, PMC	Beta3	Supplier	Beta	Face-to-face	86
Director Key Account	Gamma1	Supplier	Gamma	Skype	64
Senior Vice President, Sales	Gamma2	Supplier	Gamma	Skype	65
Country General Manager	Gamma3	Supplier	Gamma	Skype	101
Vice President, Sales & Marketing	Delta1	Supplier	Delta	Phone	80

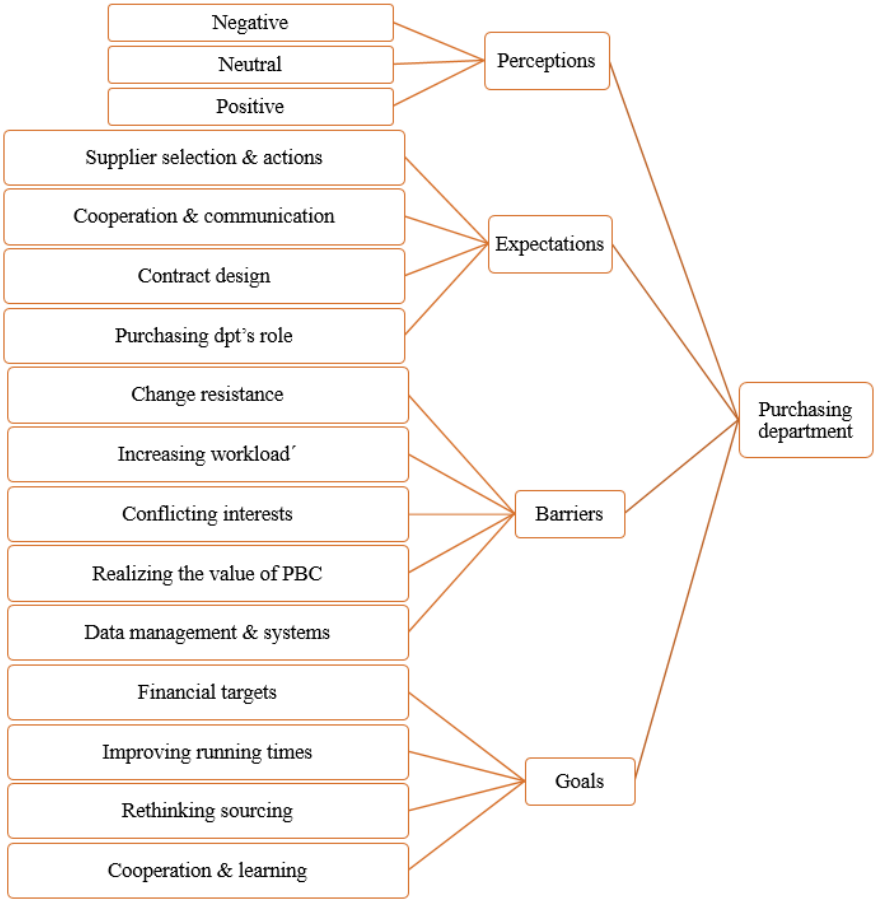

Figure 5. Example of data structuring done based on Gioia et al. (2013) data analysis

Assessing the quality of the research

As Easton (2010) note, researchers face the challenge of interpreting the data; namely understanding the studied subjects' understanding. Thus, this challenge of researcher's interpretation, actions and procedures can affect the quality of the research. Due to the diverse perspectives of case research, researchers also seem to lack mutual agreement on how to assess case research quality: Yin (2018) identifies construct validity, internal validity, external validity and reliability as tests to measure the research quality. Wagner et al. (2010) question suitability of Yin's tests since according to them, those are suitable only for positivistic and often quantitative research. Consequently, they propose the tests called credibility, transferability, dependability and confirmability that reply to, by and large, similar questions as the ones Yin (2018) introduced (Wagner et al. 2010). Table 6 summarizes the tests, their definition and how the tests can be used in

practice. Besides Yin (2018) and Wagner et al. (2010) categorization, Tavory and Timmermans (2014) present that there are three additional questions to evaluate the quality of abductive case study: how well the theoretical claims fit with empirical findings, assessing are the chosen theoretical claims the most suitable ones to research scope and questions, and is the theory created in the study so meaningful and remarkable that it stands out for the broader scientific community.

As stated before, the tests of Wagner et al. (2010) are somewhat similar to the ones of Yin (2018). Credibility, counterpart to internal validity, refers to the extent how believable the findings are (Wagner et al. 2010). To ensure research's credibility, the researchers should constantly take notes, keep an open mind and try to see the studied aspect from the subjects' perspective (Wagner 2010; Yin 2018), all aiming to answer "why" questions (Eisenhardt 1989). Transferability, counterpart to external validity, refers to the extent how well the findings can be transferred or generalized to respond to bigger population (Wagner et al. 2010; Yin 2018). In case studies transferability is often limited, since they aim to represent single phenomenon and might not be applicable universally (Easton 2010).

However, Eisenhardt and Graebner (2007) state that though cases are distinct and singular units, theory that is built based on the precise data of these cases can be more objective than thought. Dependability, counterpart to reliability, refers to the extent how easy it would be to repeat the study and how likely the same results would appear if the study was repeated (Wagner et al. 2010; Yin 2018). Clear case study database and protocol together with transparent chain of evidence improve the research dependability (Yin 2018). Lastly the test applicability, counterpart to construct validity, refers to the extent how well the research methods fit with the research goal and if correct operational measures are used (Wagner et al. 2010; Yin 2018). Yin (2018) states that revising the study also with other researchers increases the accuracy of the study and thus improves applicability. Hence, the study was discussed with several experienced academics throughout the research process.

Table 6. Assessing the research quality of the case study

Test	Definition/aim	Case study tactic	Actions taken
Creditability (internal validity)	How believable the results are and do they actually present the subjects' mental models (Wagner et al. 2010) Seek causal relationships, minimize the bias and confounding terms etc. (Yin 2018)	Acknowledge and consider rival explanations (Yin 2018) → open mind Constant observations Data triangulation (Salo et al. 2009)	Help from other academics Awareness of personal expectations and interpretations, aiming to objectivity
Transferability (external validity)	Where and how findings are generalizable (Yin 2018) Can the findings be generalized to present broader population (Wagner et al. 2010)	Choosing the right research questions to address the external validity (Yin 2018)	Transferability cannot be guaranteed, since the aim is not to find generalizable results Form of research questions
Dependability (reliability)	How easily and likely the case could be repeated and how possible it is that it would result in similar findings (Yin 2018; Wagner et al. 2010). In other words, how easy is it to replicate the study?	Case study database, protocol & chain of evidence (Yin 2018) Test-retest & inter-judge test (Wagner et al. 2010)	Materials in a retrievable form in a safe place Transcribing interviews and taking notes constantly
Applicability (construct validity)	Choosing correct operational measures (Yin 2018) Are the research methods suitable for the research goal (Wagner et al. 2010)	Using multiple data collection methods (Yin 2018) Revising the text alone and with someone else (Yin 2018)	Interviews, archival records, documentation and observation as data sources Regular feedback and comments from supervisors

5 Findings based on identified perceptions, expectations, barriers and goals

In this chapter, the findings are introduced so that they aim to offer a thorough illustration of PBC in service triads, starting from perceptions and expectations and then moving on to barriers and goals. To prime the interviewees to the topic and core interview questions, their knowledge and previous experiences on PBC were reviewed. Most of the interviewees knew at least to some extent what performance-based contracting means, and many had previous experiences of something similar. For example, several mills stated that they have similar type of contracting method used in chemicals where the chemical supplier is payed according to produced tons. Suppliers were also familiar with the topic, and some had taken a pilot or were running successfully some contracts that resemble PBC with their other customers. Especially a contracting method where the buyer pays for a fixed fee for supplier in exchange of products or service over a certain period of time was mentioned. The fixed fee thus includes all the fabrics and service despite of how much is being used, enabling better forecasting and planning. After the priming the interviewees, the key themes of perceptions, expectations, barriers and benefits were introduced and discussed.

5.1 Perceptions: from total resistance to eagerness to try

In order to understand how the actors perceive PBC, the perceptions of the interviewees were categorized primarily to three categories: positive, neutral and negative (Table 7). Both interviewees' direct responses as well as their indirect responses such as gestures, tone of the voice, body language (when interviewing face-to-face) were taken into consideration. Naturally, many of the interviewees had neutral perceptions, so that they for example identified the possible benefits of PBC, yet had also their concerns. However, each actor had interviewees who held a differing opinion with the rest of representatives of the same actor, and therefore it can be said that the perceptions describe very personal mindsets. Some were more surprised by the topic of the interview whereas some had clearly reflected the topic and had strong opinions. Strictly speaking, purchasing organization had more positive perceptions of PBC, whereas suppliers had quite neutral perceptions and mills had mostly neutral or negative perceptions.

The first category is positive perception towards PBC. Here, positive perception means that an interviewee's mindset towards PBC is more in favour than against. All the actors in triad found something positive of PBC, and there were no significant differences between the actors. Especially purchasing department saw that PBC would have potential to change the current situation, and that eventually the advantages would override the disadvantages. Since the idea of PBC in this case stems from the purchasing department, they obviously had more positive perceptions on the strategical side of PBC. In turn, suppliers see PBC as an opportunity to stay in the competition, develop current means and open up more opportunities. Besides, they see that PBC would emphasize the quality and the efficiency which is seen beneficial. Similarly, mills see it as an interesting idea that could be worth a try if the win-win situation could be achieved.

> *We have to take this industry forward and that's why I believe in this [PBC] so much (Country General Manager, Gamma3).*
>
> *I hope we can follow this through, because this will somewhat change the laws of the industry. This is a great deal/idea. (Category Director, Alpha1)*

The second category is neutral perceptions towards PBC. Neutral perceptions show more or less that the interviewees are able to see both positive and negative sides of PBC. In general, most of the interviewees were neutral, acknowledging that the idea is good and interesting, yet they have their concerns. Mills and suppliers express slightly more neutral and negative perceptions than purchasing department. Many suppliers admit that they are not against PBC or that it would not work, but they are unsure how it should be done or how for example the mathematical model should be built in practice. Similar to suppliers, mills identify that the idea would be interesting, but they do not know how to do it. They remind that the process and machinery are so complex that though PBC would be possible, it would not be an easy task. They also emphasize that the value should be visible to show that it is worth the try, since now they see no need to change the practices. Purchasing department agrees, but also reminds that though the results cannot be seen beforehand, it cannot be successful in the first place if it is never even tried.

> *As we don't know if this is successful, so it can go also in the other direction but then we have to live with this. But if you don't try you never know. (Sourcing Manager, Alpha2)*

> *It is wrong to say that we are against [PBC], but we have not yet been able to find a model that we would see fair enough … we haven't seen or have not being able to offer such model that would work, and so that we wouldn't need to take too big risks when it comes our products, sales and profitability. Thus we are not against it, quite the contrary. (Vice President, Sales & Marketing, Delta1)*

The third category is negative perceptions towards PBC, and of which consists of thoughts of PBC not being a feasible contracting method. Interestingly, purchasing department did not directly imply that they would have any negative perceptions of PBC, though they identified what negative perceptions other actors could have. In addition, their comments on gain sharing were in this case categorized as negative. For example one of the interviewees stated that if something is achieved and savings appear, all the money is going to stay at the buyers' pockets, implying that the benefits reaped from PBC are not going to be shared with the supplier. When it comes to mills perceptions, they had the most negative ones and had hard time realizing the value PBC would bring to them or the business. A few also stated that they do not want to be the ones to pilot PBC and several mentioned that they are skeptical of the idea. Similar to mills' perceptions, suppliers' negative perceptions seem to be related to preconditions and skepticism, and they also have hard time understanding the value of PBC. Besides, suppliers are not convinced that the idea is really thought-through, and state that:

> *With the preconditions that I have understood, I cannot see that it could really work. (Director, PMC, Beta3)*

> *I'm quite skeptical, I do not believe that this will work, the potential is after all quite small when looking at the big picture if you think about our total costs. (General Manager, Mill2)*

Table 7. Proof table of perceptions of PBC

Quote	First-order category	Second-order category	Theme
This will be a great philosophical change to the current thinking, when executed (Category Director, Alpha1)	Philosophical change	Positive perceptions	Perceptions of PBC
it must be a balance … we strongly believe that it's time to think about different ways of getting better prices, more fair prices for better performance of the product (Senior Vice President, Sales, Gamma2)	More fair prices		
Sure it could be interesting to see how it works. I would be interested in doing something like that (Production Manager, Mill1)	Interest to try		
The traditional way, that you design a contract, negotiate prices, let it run for two years, make another contract and negotiate the prices again. Sometimes it can be fun but most of the time it is extremely exhausting and stupid work. And you might not even get the best price or the best cost structure. So you need to do it somehow smarter (Category Director, Alpha1)	Current procedures are exhausting	Neutral perceptions	
Alpha's idea of calculating performance position-wise, I see that everything is mathematically possible, yet I wonder how do you calculate it (Sales Director, Beta1)	Calculating		
I believe this could be done, but it won't be an easy job (Production Manager, Mill4)	Not an easy job		
Our principle in here is that if something is modified and savings occur, all the money will be ours. Nothing is given to the suppliers (Category Director, Alpha1)	Uneven gain sharing	Negative perceptions	
If all the suppliers would stay and Alpha starts paying by cost per ton, I don't really get how it would benefit us at the end of the day (Director, PMC, Beta3)	Realizing the value of PBC		
Personally I wouldn't do it, because it would require so much pondering about the measures. We don't really have time to ponder anything like that (Operations Manager, Mill4)	A lot to think about		

Though the perceptions and expectations are often identified indirectly from the interviews, one of the interview questions was formed so that it left only little room for doubt or misinterpretations. The interviewees were asked if they believed Alpha would be willing to pay more for better products or performance. Some of the interviewees did not quite answer the question, but the ones who did, said it clearly. For example, most of the suppliers did not believe Alpha would actually pay them more since they have not had that experience over the years, and something

would need to change if that was going to happen. Similarly, some mills thought that since the quality is on a sufficient level already, Alpha would not pay more than today.

> *I don't think that Alpha they'll pay more … there have to be a mind change on the Alpha's side as well that, a better product have to have a better price. (Director Key Account, Gamma1)*

On the contrary, purchasing department and majority of the mills see that Alpha would indeed be willing to pay more for the better product, yet especially mills highlighted that better performance needs to be somehow visible and/or measurable in order to prove its effectiveness. Interviewees rationalize their opinions by explaining that if there is a payback and you can prove that the machines run smoother and there is better reliability, then it would make a lot of sense to pay more. One of the purchasing department's interviewees also acknowledges that by paying the supplier more, they also wish to motivate the supplier to improve their performance.

> *If you expect good quality you have to be, in a place that you, are willing to pay a little bit more. You don't get anything for free. (Production Manager, Mill1)*

5.2 Expectations: showing the interest in PBC but there is a lot to agree upon

All the parties had some expectations or prerequisites that need to be negotiated before the contract could be signed and expected benefits could be reaped. To answer the second sub-question, what do parties expect from PBC, there is no coherent answer. Though the expectations were quite fragmented, some similarities could be found. For example, all the parties have an opinion or prerequisites of agreeing on contractual details, and all the parties agreed that the contract length in PBC is more likely to be longer than in a normal product-based contract. Relational aspects such as close cooperation and high level of trust are identified as essential successors of PBC. One of the interviewees illustrated the relationship between purchasing organization and the mills by presenting that there are like two bubbles, one where the mills live in and another where the purchasing department lives in. Since the setting is a triad, the third bubble would obviously be the suppliers' bubble. In order to take the other bubble's perspective, there needs

to be trust and transparency between the bubbles. Many interviewees also told that the perceptions and expectations of PBC are highly personal matters and some are more against change by nature.

> *The thing is, you have to go this way and trust each other that you want to do the best on both sides, or this will never work. (Director Key Account, Gamma1)*

Mills and especially purchasing department expect the chosen supplier(s) to have certain attributes. Both agree that any supplier will not do, but the supplier should have certain characteristics or capabilities, such as someone who is known and has proven to be trustworthy and who has the required capabilities and resources. Moreover, the supplier is expected to have the high willingness to engage in the model. Matching with these requirements, a few suppliers were mentioned and who could potentially be the ones to start with. The same names arose in different interviews and for example Category Director (Alpha1) had a clear opinion with whom he thinks PBC should be launched. Furthermore, suppliers are expected to act accordingly, namely to be more proactive, innovative and to ensure good local service. Contrary to purchasing department, suppliers and a few mills argued that PBC could work only when there is only one supplier, since it would automatically remove the risk of blaming other's fabrics for causing the problem. All in all, these expectations towards suppliers are most likely affecting the supplier selection later on.

> *You need the guys especially at the beginning who believe in this what you are doing and also fighting for this. If there are people or companies, internal or external who have some resistance then I have to say, maybe they are not the right one, not as a starting point. (Sourcing Manager, Alpha2)*

Purchasing department's expectations

Purchasing department had probably the clearest expectations of PBC, since the idea stems from their side. However, they possess a variety of expectations (Figure 6) towards supplier selection and how supplier should act to their opinion. Naturally, purchasing department expects supplier to be big enough with enough resources, with whom there is already ongoing business and who has proved their trustworthiness and capabilities. Purchasing department would not necessarily take the supplier who is strategic supplier for them but rather the one who is truly willing to

engage in the process, to develop the business and who has something in their sleeve to contribute to PBC. Besides, as one of the interviewees note, it is also dependant on the internal climate of the supplier, and probably all the suppliers would need to think it through internally. Interestingly, the names of the suppliers Beta, Gamma and Delta arose when discussing the suitable supplier but only Alpha's Category Director (Alpha1) had a clear opinion that Beta should be selected for PBC pilot. Beta's selection is also amplified by the fact that Alpha and Beta are launching closer cooperation with a shared system and hence taking Beta to learn from PBC would be a natural continuum. To illustrate the expectations of the suitable supplier one of the interviewees says:

> *Expectations of PBC are definitely supplier selection aka who has the resources and capability to come along, and then probably the most importantly, who has the willingness to come along. (Vice President, Raw Materials, Alpha4)*

After choosing the right supplier, the expectations towards cooperation and communication take place. Generally, purchasing department believes that PBC would increase and tighten the cooperation between the actors of the triad. Between purchasing department and suppliers, the purchasing department sees that the relationship with supplier goes more in the direction of managing the suppliers, and which requires also more from Alpha as a buyer. Similarly, open books and frequent communication are expected between the parties involved, and which further is expected to increase trust and transparency. Besides, interviewees acknowledge that the current way of pressuring the suppliers for the lowest price does not work anymore, but now there needs to be a fundamental change where the target is to create long term relationships with open communication. In other words, PBC needs to be fair for both ends. Some also believe that PBC would further improve the relationships between the actors, especially between purchasing department and mills. Ideally, PBC would be piloted in an environment where the costs would be secondary, and learning would be primary, since the long-term target is to learn and only after then reap the benefits. When piloting, making mistakes should not be a problem or a reason to punish, but a way of learning and improving. As one of the interviewees put it, PBC requires resources from both parties and certain commitment and daring.

Technically speaking, the interviewees also expressed their expectations of agreeing on contract design and details including pricing, performance measures and data. Primarily, the interviewees agree that the contract should benefit both, and both need to perceive it as fair and clear. Besides, contract design and especially the pricing model is reliant on the available data. Interviewees think that either the supplier has to have access to data, or the systems need to be built reliably, that suppliers trust the pricing derived from the data. Moreover, the measures and pricing model should be so objective that it leaves no room for speculation. One of the interviewees also state that the model should be dynamic, so that it would include several metrics due to the complex nature of machinery. In the beginning, interviewees suggest that there would probably be a fixed pricelist, and then additional fees depending on how the performance develops. Naturally, performance metrics as well as the pricing model should be agreed upon together with the supplier. Pricing model as well as the performance metrics should be further adjusted depending on the situation. As one of the interviewees presents:

> *I presume that the performance-based metrics would be so objective, that it leaves no room for speculations, since those are not measured or analysed by the mills but specifically these KPIs we have anyways. (Business Development, Alpha5)*

Besides having expectations towards suppliers, the interviewees of the purchasing department were the only ones to express expectations towards their own actions and what kind of role they would like or should take in the process. Clearly, purchasing department would be the driving force rather than the mills, though there has also been some previous experiences of mill-driven processes. Purchasing department also has high expectations towards their own performance and they believe that they are the actor that has the ability to bring different parties together to solve common problems. They see that internally, they should have the required competences and know-how. Furthermore, this new role of purchasing department can work as a catalyst to innovation.

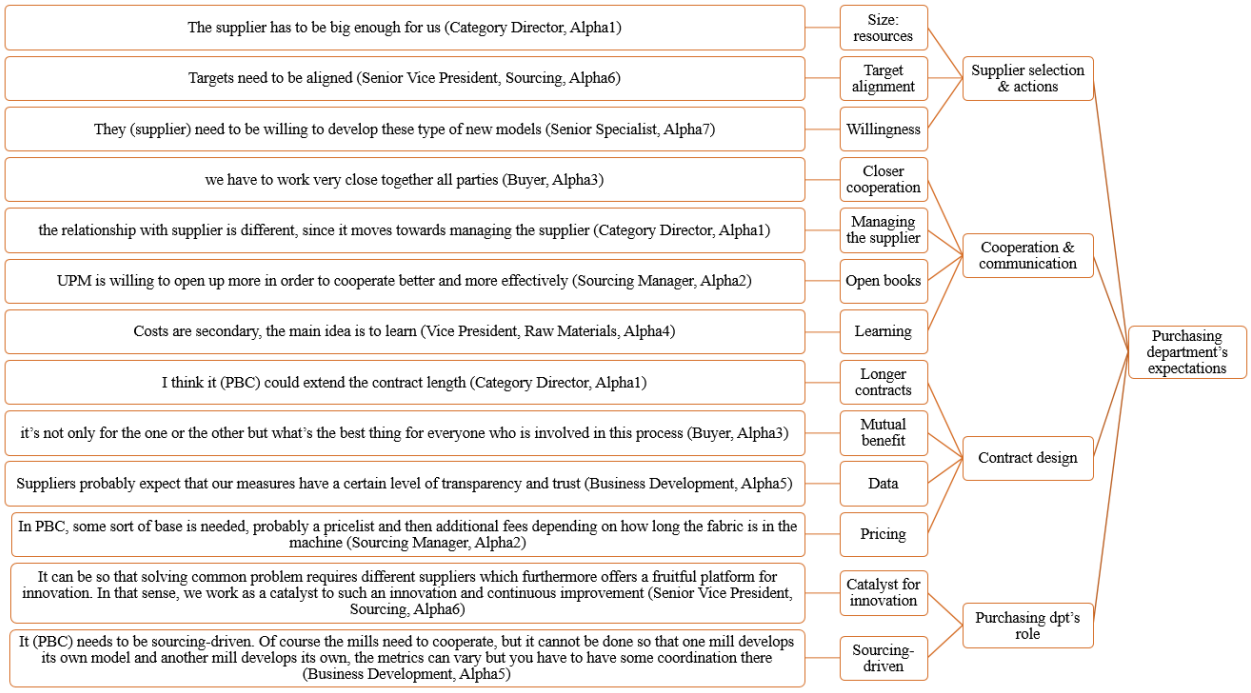

Figure 6. The expectations of the purchasing department

Suppliers' expectations

When taking a deeper look at the expectations suppliers have of PBC, it is evident that suppliers expect PBC to create mutual benefit, require high level of trust and increase transparency (Figure 7). They state that their targets should be in line and that the contract should be designed so that both parties find it satisfactory. However, the interviews show that finding the agreement might not be that simple and express their concerns of misbehaviour. They also highlight the importance of mutual benefit and that the current practices need to be changed in order to achieve successful introduction of PBC. Similarly, transparency is expected to increase, so that the supplier would also be able to see what the formula for the calculations is and where the numbers are coming from. Suppliers also expect open books from both sides, and for example the calculations for the pricing model should also be transparent for the suppliers. In addition, suppliers find information sharing and feedback crucial, and as of Beta's put it:

> *To my work, it is very important that they would be constant feedback. Not every half a year or once a year, but rather on a monthly basis to check if we are going to the right direction. Otherwise this pricing model could not work. (Sales Specialist, Beta2)*

Suppliers also acknowledged that parameters of performance need to be fixed and contractual details must be agreed on before PBC can be launched. More specifically, suppliers identify a bunch of boundary conditions that for example include ensuring that supplier is paid even if something other than the fabric would cause the fabric change. In general, the aspects mentioned by the suppliers are quite practical. In line with the open books previously mentioned, suppliers also had a strong opinion that production numbers among other information should be easily accessible and based on which the calculations could be done. Another boundary condition is the ability to adjust the parameters afterwards either up or down, if the prevailing parameters do not respond to the real situation. For example, one of the interviewees states that if there is a benefit the customer would get it in the next period, and if there would be something abnormal it could be fixed to the next period before it makes too much damage. In other words, suppliers want to make sure that the contract signed cannot exploit them too long if the incorrect parameters were chosen at first.

Naturally, suppliers are also concerned about the financial side of PBC and how they are being compensated. Interviewees note that in order to engage in PBC, they need to be sure that the model also ensures their businesses' profitability and that they cannot take too big risks when it comes to profitability. The expectations towards the compensation model are high, and all the interviewees expressed their concerns or thoughts towards the model. Interviewees also have a general opinion that Alpha would not be willing to pay suppliers more for a better performance and only one of the interviewees from the suppliers' side stated that he believes Alpha would pay more if the facts and situation were indeed visibly better than before. Hence, some presented that they needs to be a change of mindset in the Alpha's side to realize that a better product also often comes with a higher price.

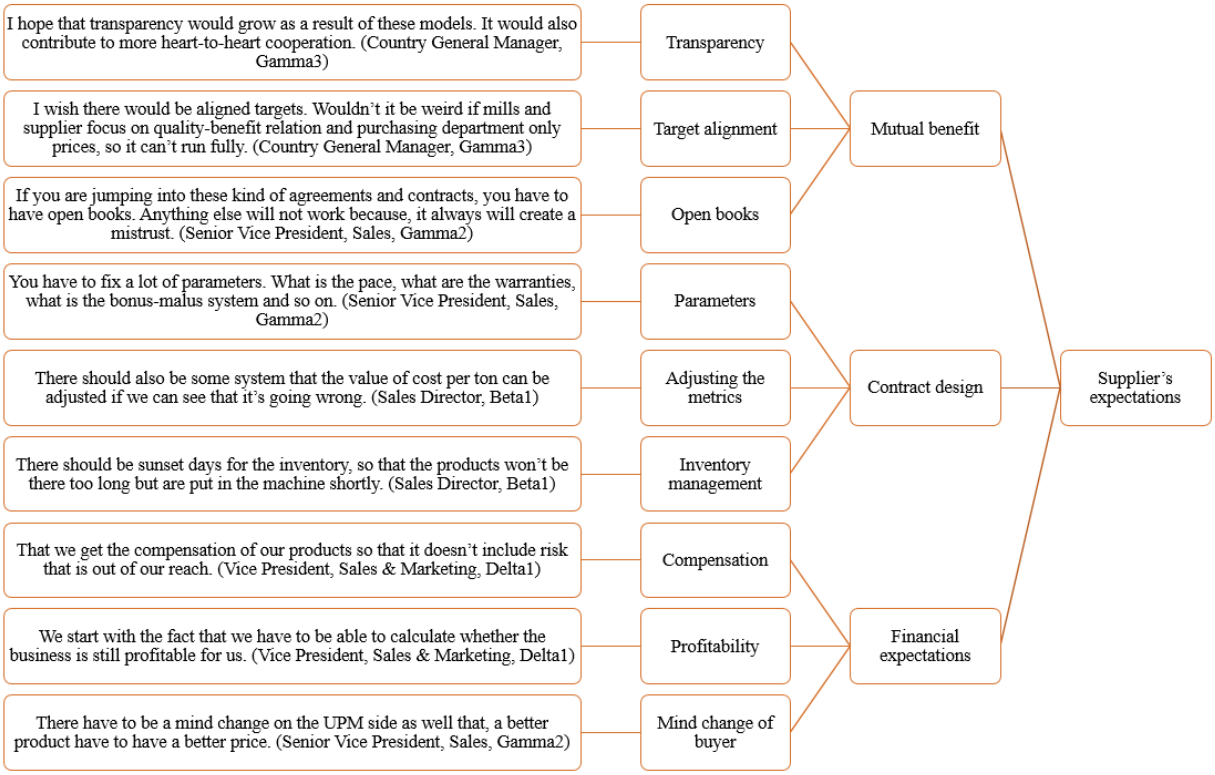

Figure 7. The expectations of the suppliers

Mills' expectations

Compared to purchasing department and suppliers, mills have probably the widest spectrum of expectations of PBC. They put much more emphasis on the incentive systems and financial aspects of PBC that other actors in triad do, and want to ensure that there is something concrete to motivate both the suppliers and themselves (Figure 8). They do not expect PBC to benefit only Alpha, but recognize that there needs to be incentive for both the buyer and the supplier. As the quote below shows, mills expect that suppliers are not willing to engage in PBC if there is not enough incentive for them. Similar to suppliers, mills also think there should be monetary boundary conditions or a pricing model where for example minimum and maximum costs need to be agreed upon, especially since there can be much variation in production. These metrics could be further adjusted if needed. Setting a maximum cost for fabric is justified for example by explaining that the costs would not sky rocket if the production is good. In addition, mills also raise a question of the compensation model and how it should take into account for example problems that are not directly related to fabrics.

> *The pricing should be done so that there would be incentives for both. I'm not sure what the correct starting point is, but in order to improve the current situation one should calculate what benefits there potentially could be available for both parties. (Senior Production Manager, Mill3)*

In line with purchasing department and suppliers' expectations, mills also expect that contract design needs to be agreed upon the process. Aspects such as performance parameters, how those are being followed and by whom as well as the preliminary work are being highlighted. According to the interviewees, a lot of aspects need close examination and consideration before the actual PBC can be launched. Hence, pre-work and negotiations are valued among mills, and they think that the idea needs to be well thought before anything can be introduced. With well thought idea, some of the pitfalls could maybe be avoided and the contract could be launched. Yet it might feel that everything is discussed and prepared for, mills also acknowledge that everything cannot be thought or planned beforehand. Clarity of both, the metrics and the model itself are supported, since then there would be no worry being penalized for something you had no part in, and there is no need to always discuss the performance level since both parties would always be on the same page. Besides, mills identify that agreeing on these performance parameters is probably something suppliers are also interested in negotiating.

In addition to incentives, financial aspects and contract design, mills expect trust and transparency to play a role in PBC. Trust, in a form of secure supply is crucial for the mills who often operate with minimum inventories. As one of the interviewees stated, the suppliers he has now would not be his suppliers if there would be no trust. In a hectic environment where the suppliers' product has a remarkable effect on the production performance, mills recognize that without trust the cooperation could not work. Mills also feel that they need to be honest with the suppliers in a sense that suppliers are not being accused on something that was not their fault. In other words, if the mills find a root cause for a problem, and it is something else than the supplier's fabric, they feel that they are obliged to tell the supplier that the problem was caused by something else. Hence, the cooperation is expected to be based on trust and transparency from both the suppliers as well as from the mills side.

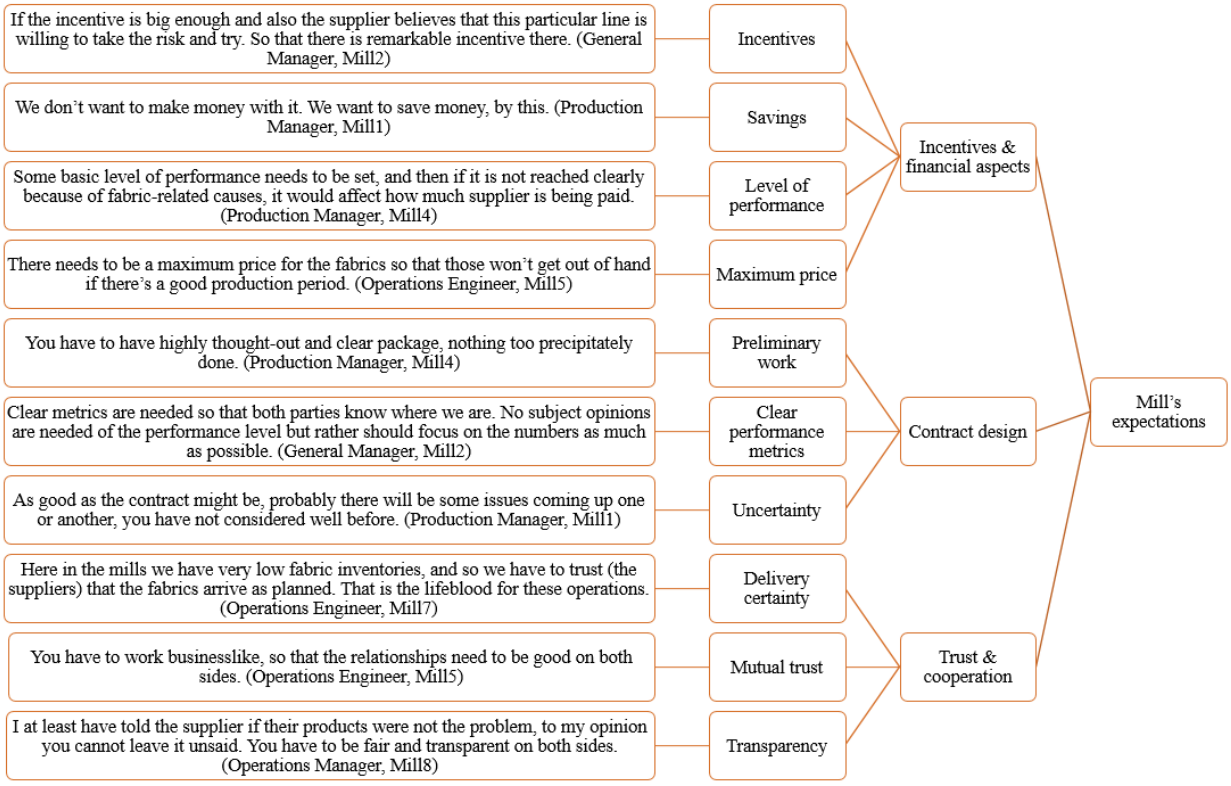

Figure 8. The expectations of the mills

5.3 Barriers: from conflicting interests to inflexibility of systems

As the literature acknowledges, transition from procuring products to procuring complex performance faces barriers and resistance. Altogether, PBC is seen challenging, because it is afraid to bring more work, the complexity of the paper making process is high and designing a compensation system that meets the requirements is complicated. Some of the barriers are in common for all the actors, yet some are exclusive to a certain actor (Table 8).

Initially, all the actors find fear of increased workload, change resistance, conflicting interests and designing a compensation system as barriers in common. Though the actors share the barriers, they might think differently from the same barrier: for example, when examining the fear of increased risk, all the parties acknowledge that primarily, it would bring more work for the mills and then possibly for others, rather than everyone acknowledging that it would directly bring more work to themselves. Interviewees also note that in the beginning, introducing such a new model would probably require more work. The same seems to apply also for the change

resistance: interviewees suggest that suppliers and mills would resist the most, and only one interviewee from purchasing department stated that the biggest resistance would occur internally. Purchasing department also recognizes that since there is resistance, lobbying is needed both externally and internally. Many note that resistance stems from individual people, and hence resistance and perceptions of PBC are highly personal matters.

> *It's of course much more work for the mill, and it's not easy for purchasing to, prepare such programmes that could work automatically. So there we have to discuss case by case, machine by machine, section by section, about the evaluation of the measurable numbers. And, this is of course, a lot of work for purchasing on one side and the mill and for us, for the supplier. (Director Key Account, Gamma1)*

> *One who is still sceptical and doesn't believe yet are some of the production people. Operations Managers and Operations Engineers. Yet some think that this is a good thing and takes us forwards. It's highly personal matter. (Vice President, Raw Materials, Alpha4)*

Similar to change resistance and fear of increasing workload, conflicting interest are often focused between two actors, though the setting is a triad. For example suppliers identify that their interest are often more aligned with mills but contradict with the purchasing department, and mills identify that occasionally, their interests also conflict with purchasing department but also with the suppliers. As many interviewees presented, the main target of the mill is to ensure production efficiency and certainty whereas the purchasing department wants to rethink the sourcing and suppliers want to sell as many fabrics as possible. These interests evidently clash and thus create a barrier for PBC. Furthermore, the fact that the buying organization is not a coherent unit, but can have opposing interests, is supported. Suppliers and mills also argue that purchasing department often has only superficial understanding of fabrics and paper machines, and improving products or performance is not that simple.

> *Currently, there's are conflicting interest between Alpha and the supplier, since the supplier's interest is to sell as many products as possible because they are compensated for the amount, and Alpha's interests are the longer running time and durable fabric, the better. (Vice President, Raw Materials, Alpha4)*

> *It [PBC] would lead to conflicting interest between the mills and the suppliers of how the fabrics should be run in the machine because those can be run in a different ways… (Engineer, Mill8)*

> *The purchasing department doesn't know what we run here, they are only after their own benefits … they have their own interests, they only want to cheap fabrics but those doesn't necessarily work here in the paper machine (Operations Engineer, Mill5)*

Designing the compensation system that all the actors find fair, transparent and can agree on is probably identified as the biggest and the most concrete barrier for PBC. As one of the suppliers stated, they are not against the idea but they have not been able to find a model that they would perceive fair enough, so that it would not threaten their profitability. Both mills and suppliers are concerned how the compensation model would take into account the complexity of the paper machine and especially in a case where it is unclear why the fabric was taken out. Clearly, mills and suppliers find designing a compensation system bigger obstacle than purchasing department does, though they also recognize its existence. More precisely, suppliers are afraid that they will not be compensated properly and mills are afraid that the compensation model leaves room for speculations and thus would force them to justify their actions to suppliers. The compensation model should be designed so that its accuracy and correctness can be trusted or the supplier should have access to the data, so that the calculations of compensation are clear and transparent for them. In order to design a compensation model questions of "what is being measured" and "how the measuring is done" are relevant, and the preliminary metric of euro per tons received critique from the interviewees. According to one interviewee, 80 % of the stops are caused something else than a fabric, illustrating why suppliers are so concerned of their compensation.

> *One of the golden rules of a papermaker is that when there is a problem in the process, the problem should be found and fixed. That is easy to say but damn hard to do in practice. And for us fabric suppliers this is an unfavourable situation, since the fabrics are visible part of the machine and thus easy to change. (Vice President, Sales & Marketing, Delta1)*

> *I see that it (the biggest barrier) is the contract design. And how to outline beforehand all the possible variations that can take place. So that the contract would make sense and how we are being compensated in each situation. Who gets what and based on what. (Sales Specialist, Beta2)*

Contrary to purchasing department, mills and suppliers share a concern over the price being the main driver of the business. Prices of PMC category products have decreased remarkably during the years, and price has traditionally been the main driver. Here, when suppliers and mills were asked whether they believe that Alpha would be willing to pay more in exchange of a better performance, and the answers was quite clear: majority of the suppliers and some of the mills did not believe Alpha would be willing to pay more. Suppliers state that Alpha has had the tendency to pressure the prices as low as possible, which can have a negative impact on the cooperation relationship. As one of the interviewees noted, the biggest negotiations are always evolved around the prices and how much the customer is willing to pay, and thus it would require a mind change from Alpha's side to put quality as the primary target and the prices only secondary. Mills and some suppliers also identified that Alpha's goal would be to aim at better cost-efficiency and lower costs, which further indicates that the prevailing situation suggest that the business is indeed driven by prices. One of the interviewees justified his opinion by stating that he does not believe that Alpha would not be willing to pay more, since the fabrics are already at sufficient quality.

> *There's been a lot of discussion that the price is the main driver of the business at the moment. So that the performance is secondary or taken as a self-evident, something that has to be there anyway. (Director, PMC, Beta3)*

> *We have discussed about it and tried to sell all our services, our values and all Beta's offerings and expertise and everything possible but the customer always says, nice to have, but the price matters eventually. (Sales Director, Beta1)*

Barriers to purchasing department

For purchasing department, undeveloped suppliers offering, data management and inflexibility of the systems are identified as barriers. First, undeveloped supplier offerings include purchasing department's expectations towards suppliers' characteristics and actions the supplier should take in PBC. To their opinion, suppliers are not currently investing enough on the performance such as running time, and thus PBC should be used to motivate them. Interviewees believe, that a challenge for them is that the suppliers should have something in their pockets to develop something new. Besides, interviewees noted that the suppliers sometimes struggle to understand

the value and benefits of PBC. Some of the comments of purchasing department sound that they have high expectations towards suppliers and really wish that the suppliers would contribute and influence the cooperation and performance.

> *Suppliers have difficulties to take a bite. I believe that suppliers generally would want and like the idea of PBC, yet some are not so keen on technological change. Again, it's important how suppliers see and want to position themselves, and whether they want to be a part of this. (Category Director, Alpha1)*

Secondly, data management was identified as challenge: one of the interviewees stated that designing the compensation model is challenging, because it is difficult to obtain reliable data from the systems based on which the calculations could be done. Quite similarly, another interviewee stated that there is data based on which the model could be built but the problem is that there is almost too much data. The vast amount of data leads to the problem of how to sort and manage it so that it actually represents the current situation and works as an effective base for calculations.

Thirdly, one of the interviewees identified that the inflexibility of the current systems is another barrier for PBC. Now, the systems work automatically so that when the purchase order has been sent, the supplier confirms the order and delivers the fabric, the receiving party receives it and puts in the machine. By then, the supplier has already invoiced the purchasing department of the order with the fixed price of the fabric. This whole process has traditionally worked automatically, but now matching the invoicing to the purchase order is not so simple since the performance of the fabric is only known afterwards. Hence, the traditional purchasing systems are not necessarily flexible enough for PBC type of new models. Furthermore, inflexibility of the systems also means that more work has to be done with the systems.

> *In a world where we are used to buying a product with a certain price and then invoiced it with the same price and everything runs automatically at the background, this new model probably requires, I wouldn't say it is an insurmountable barrier but it requires developing and re-thinking the systems. (Senior Specialist, Alpha7)*

> *These new models, just like this [PBC], they make you think that why it cannot be implemented already, but that's because we have systems that do not bend, and that's why we cannot do it. (Senior Specialist, Alpha7)*

Barriers to suppliers

Barriers, that suppliers identify but purchasing department and mills do not, are developing a PBC contract and fear of increased risk. First, developing PBC contract was especially identified as a barrier among suppliers. Technically, designing and implementing compensation model which all the actors identified as a barrier, is a part of contract design, though suppliers are the only party who is concerned of the bigger picture of the contracting. For example, one of Gamma's interviewees describes that the negotiations with Alpha are tough and inflexible and make the supplier feel that Alpha is only after their own benefit. Similar to price being the main driver of the business, to suppliers' opinion Alpha seems to act according to their own interests and not being able to discuss and find a solution that both parties would be satisfied with. Agreeing on contractual details is seen challenging, since conflicts and disagreements could arise within these negotiations, and though it has been tried, such model that both parties would consider fair enough to sign is not found. Therefore, the suppliers fear that designing the PBC is yet another way for Alpha to put their personal benefit over the mutual benefit. Besides, the contract design includes the discussion of performance metrics and how the complexity of the machinery and different variables affect the contract design.

> *I see that it [the biggest barrier] is the contract design. And how to outline beforehand all the possible variations that could take place. So that the contract would make sense and how we are being compensated in each situation. Who gets what and based on what. (Sales Specialist, Beta2)*

Secondly, the suppliers are obviously afraid that they have to take too big of a risk, so that it threatens to harm their sales or profitability. Besides the fear of bearing too much risk from the financial side, suppliers also want to make sure that they do not have to bear risk of things they cannot contribute to. Here, the design of compensation model and risk bearing are intertwined, since the compensation model aims to balance the risk and make sure suppliers bear only risk of things they can contribute to. As one of the interviewees notes, the turnover of the paper mills are considerably larger than the turnover in the paper machine clothing, and thus suppliers are

afraid to take too much risk. In other words, they are afraid that if PBC will not be successful, they will not be adequately compensated for their work and the contract will be ended as soon as possible, leaving the supplier to struggle financially.

> *The biggest risk is that we have not fixed all the parameters which have a negative influence on the performance of our goods. And then you are penalized for something that you have no influence in. (Senior Vice President, Sales, Gamma2)*

> *Alpha has the tendency to pressure the prices to the minimum, leaving the supplier with the risk that if the machine doesn't run as it should, we won't get enough money from it. (Sales Director, Beta1)*

Barriers to mills

Mills identify that they lack information of the internal best practices, which can also be seen as a barrier. Currently, there are information silos, and each line or machine knows what is going on in their machine but have no idea how other mills are doing. As one of the interviewees stated, the discussions with the supplier have shown that only little knowledge is shared between the machines and mills, and that insufficient information can also affect the efficiency of the suppliers' actions. Though some mills are also closely located geographically, the information sharing is not supported. Some state that there is neither enough time nor forums to share the best practices or other information between the mills. In addition, one of the interviewees felt that the information between the mill and purchasing department is not always smooth, and felt that purchasing department acts according to their own interests and that they do not really understand what is going on at the mill since they are not familiar with each machine specifically.

> *If the fabrics have run well somewhere, we don't share that type of information here in Alpha at all to my opinion. For example if a German mill has run successfully a new fabric type from a supplier and has reached very good results with it, we wouldn't know that. So sharing this type of information should be the task of purchasing department or someone who is in contact with all the mills and who has the channels to access and share such information and who is also in contact with the suppliers. That way some other mills could also benefit from the knowledge. (Engineer, Mill8)*

Table 8. Summary of the identified barriers in the triad

	Purchasing dpt.	Suppliers	Mills
Conflicting interests	x	x	x
Purchasing practices driven by price		x	x
Undeveloped supplier offering	x		
Resistance to change	x	x	x
Information silos / lack of information of internal best practices			x
Developing PBC contract		x	
Designing and implementing a compensation system (that is fair, transparent and takes into account complexity of the factories)	x	x	x
Fear of increasing workload	x	x	x
Data management (too much data)	x		
Inflexibility of current systems	x		
Fear of increased risk		x	

5.4 Goals: Aiming towards cost-efficiency and re-thinking the business

Interestingly, when answering the fourth sub-question, why is PBC seen beneficial, the responses were prudent. In general, PBC is believed to bring competitive advantage to Alpha, better running times and less work for the mills, and closer cooperation and bigger volumes for the suppliers. In other words, PBC would enable parties to work more effectively. On the other hand, interviewees seemed to have a clear opinion on what the other parties' goals were, and sometimes they found it easier to identify how PBC would benefit the other actors rather than themselves. For example, all the suppliers interviewed had a strong opinion on what is Alpha's goal, but had rather mild opinions on what their own goal is. For example Delta1 argues that Alpha is after two things:

> *I'm quite sure Alpha is after two things. First goal is that they want to lower their fabric costs per produced ton … Second goal is that this would somehow drive both suppliers and Alpha in the direction of developing better solutions which would further contribute to machines' bigger and more efficient production. So probably it's the combination of these two, not only looking for the lowest price, though I believe it is there also, of that I'm sure. (Vice President, Sales & Marketing, Delta1)*

Mills are on the same track with suppliers, albeit they are able to identify a broader set of goals. On the contrary, purchasing department identified several goals and benefits for them, but thought less about the suppliers' goals. To purchasing department's opinion, suppliers can see PBC as an opportunity to differentiate themselves from the competitors which at least to a certain extent, is also a goal suppliers indeed recognized.

> *I think that from the suppliers' perspective this business model could drive them to re-think this cooperation … they might see this as a business opportunity, leading to longer contracts and being more like a strategic decision. (Senior Specialist, Alpha7)*

Goals for purchasing department

For central purchasing, the goals are financial goals, cooperation and learning, re-thinking sourcing, and improving running times and quality (Table 9). Like any other businesses, with PBC Alpha wishes to achieve lower fabric costs per ton, better cost efficiency and production efficiency. Interviewees believe that as a result of PBC, the efficiency would improve remarkably, and therefore PBC is seen as a part of bigger change that aims towards further improving cost-effectiveness. Similar to financial barriers, purchasing organization is able to identify how PBC would affect suppliers' financial situation. As one of the interviewees stated, it does not matter what the suppliers' gross profit margin is, as far as Alpha's euro per produced ton is the best in the markets. Interviewees believe that PBC would also allow suppliers to also gain more revenue by building the model so that it allows win-win situation for both. Furthermore, the financial goals imply that whatever the benefit is, it needs to be measurable in financial terms. Contrary to aiming towards the lowest prices, one of the interviewees stated that:

> *Price of the product can go up, but the costs need to go down. We aim towards cost-efficiency, not the lowest prices. (Sourcing Manager, Alpha2)*

Second goal for purchasing department is improving running times. Longer running times mean that there are less stops and that the fabrics need to be better than before, in order to run longer. Every time a paper machine needs to be run down for fabric change, mills lose valuable production time. Hence, longer running times would require less frequent fabric changes, meaning that less fabrics would be used and reducing stops would also reduce work. All this would lead to

better efficiency and other financial goals. Interviewees also use the longer running times as reasoning for paying more for a product by stating that though the fabric could cost more, it could also be cheaper at the end of the day compared to a fabric that runs shorter time but is also cheaper. Besides, interviewees noted that in 2014, they set four targets of which longer running times is the only one that has not been reached yet.

Third goal identified is re-thinking sourcing, aiming to find a disruptive sourcing model in order to ensure Alpha's competitive advantage in the markets. Re-thinking sourcing can be seen as a part of bigger picture, where a new angle to sourcing should be taken and thus to differentiate Alpha from others and invent something that is difficult to copy and unique to the markets. If PBC was to succeed and sourcing could be done differently, it is believed to change the laws of sourcing in pulp and paper industry and to bring competitive advantage over the competitors' sourcing processes. All in all, having a clear image of what is wanted to be achieve with PBC, how it practically would work and how it would take Alpha to the wanted outcome, could indeed lead to a competitive advantage and stronger position in the markets. Summarizing the last two goals, improving running times and re-thinking sourcing is well described by one of the interviewees who states that:

> *We want to extend it (the running times) and the only way to reach this is to change the business model so that we purchase the production time. Because currently, the suppliers calculate their share of markets based on how many fabrics they have sold to us. We want to get rid of that. We want to measure how many tons from all the tons they have been able to produce. (Category Director, Alpha1)*

Fourth goal for purchasing department is developing cooperation and learning. Transition from buying products to buying performance requires also fundamental change, and has on effect to the relationship between the buyer and the supplier: in PBC, the supplier takes a different role and the direction is more on how to live together and build the model together. Since the core idea is to achieve win-win situation and continuous development within the model, the model itself needs to be designed so that it removes the biased perspective and instead gives incentives to joint development. As a result of successful PBC piloting, both parties would learn and develop the business and the fabrics together. Moreover, the performance of suppliers involved in

PBC would increase and make a bigger performance gap between the suppliers who are involved and who are not.

> *To my opinion, optimally, it [PBC] would create better platform for the cooperation and not only the fear of losing sales, but rather it could be seen as an opportunity to improve the production together. (Senior Specialist, Alpha7)*

Compared to purchasing department's own goals, they seems to believe that suppliers would like to engage in PBC because they see that the competition is tough and this would be another way for the suppliers to differentiate themselves from their competitors. It is also believed that differentiation would also raise the barriers for new, especially Asian suppliers to enter the markets. In addition, purchasing department believes that suppliers would see longer contracts, possibly bigger volumes and closer cooperation as a goal for PBC. When looking at the bigger picture, the purchasing department believes that PBC would encourage the suppliers to re-think their procedures too and that they could see PBC as a potential and interesting business opportunity too.

Table 9. Goals of PBC identified by the purchasing department

Financial targets	• The main thing is of course to reduce the fabric cost per ton of paper. That's the main target. (Buyer, Alpha3)
Improving running times	• We want to change this so that the fabrics would last longer so that we can increase the running times and thus improve the efficiency. (Category Director, Alpha1)
Rethinking sourcing	• This is part of bigger picture, where we have to think how to outbrain the competition from sourcing's perspective. We need to differentiate ourselves and come up with smarter ways to source. (Category Director, Alpha1)
Cooperation & learning	• We aim to change the operating model towards continuous improvement, and hence the pricing and contracting models are wanted to be changed so that the disagreements would be removed and incentives to improve on continuous basis would be offered instead. (Vice President, Raw Materials, Alpha4)
What Alpha thinks suppliers want	• This model is a way for Western suppliers to differentiate themselves in the markets and with which they can bring us additional value. (Category Director, Alpha1)

Goals for suppliers

Undoubtedly, the biggest benefit that PBC could bring to suppliers is increased transparency and cooperation, since all of the interviewees noted its importance (Table 10). Suppliers believe that as a result of PBC Alpha would open up more and suppliers would have for example better access to data. This type of transparency would allow creating more discussion based on the data, which could further lead to more structured development instead of ad hoc development that currently seems to take place. One of the interviewees also stated that to their opinion, transparency has already increased as a result of shifting from local purchasing to central purchasing department. Furthermore, transparency in PBC would ensure that the competition is truly between the best products, rather than preferred suppliers or other aspects. Accessing more data would also enable suppliers to respond to the changes in the process and develop products that fit best to the current need. Hence, it can be said that transparency and cooperation are seen as enablers for improved performance and advanced decision making.

> *If we are able to make decisions more based on the data, it could mean that this would also benefit us in a sense that we show that our products function better and would bring better cost per tons, and thus could lead to doing more business with Alpha. (Director, PMC, Beta3)*

Another goal suppliers identified is bigger volume. Continuing from what Director, PMC (Beta3) said, transparency could lead to more business with Alpha, and hence suppliers identify gaining economies of scale and competitive advantage as remarkable goals for PBC. However, one of the interviewees note that performance-based contracts might not be more profitable when looking at their margins, but the advantage is that they have tied the customer with large volumes and longer contracting lengths.

> *The volume we have in our sites, in our production, that's our benefit. The risks, stay the same as if they make normal business. But we have of course a lower risk on volume variations because we have the contract for a period of time to deliver, this amount of goods, which means that we are from the volume point of view secure. (Director Key Account, Gamma1)*

Moreover, tying the goals together, the suppliers hope that PBC would eventually bring them competitive advantage. Hence, suppliers would have the possibility to widen their product range at Alpha's premises and instead of supplying only fabrics, they could offer wider set of products or services. Offering broader set of services, suppliers could also attain competitive advantage over the competitors. As stated before, better access to data could also allow deeper cooperation which can further improve the suppliers' position compared to its rivals. Naturally, suppliers are interested in PBC because they want to perform better than the competitors and thus get better prices on their offerings. As one of the interviewees present, the main goal for them is to achieve certain kind of growth as a result of PBC.

When it comes to suppliers' perceptions on what Alpha's goal is, the results are clear: suppliers expect Alpha to aim to lower costs with longer running times and search for new ways to do business. Some also think that the goal of the customer is to benefit and not necessarily to find mutual benefit. Besides, the comments of the suppliers show that suppliers find it easier to identify benefits for Alpha than to themselves. For suppliers, some of the purchasing department's goals seem more like barriers to themselves. For example, Gamma2 argues that purchasing department aims transferring the risk more on the supplier side, and get the costs under control. Here, if purchasing department's goal truly is to transfer the risk to the supplier, it understandably creates concerns or even barriers to suppliers. Some also hit the nail on the head when thinking that Alpha aims to re-think sourcing:

> *I am sure that Alpha is looking for practical examples to run new business models or new ideas of contracts but also that they will not change their complete purchasing behavior in this direction. They will take case by case, but not that they will switch from one day to the other to the new, to such a new business model. (Director Key Account, Gamma2)*

Table 10. Goals of PBC identified by the suppliers.

Increasing transparency & cooperation	• If there are machines or mills that have preconceptions towards certain supplier, this would increase the transparency and would show that with this supplier Alpha has been driving performance-based and has achieved this and this much tons. (Country General Manager, Gamma3)
Bigger volume	• These contracts might not be more profitable when looking at the margins but on the other hand the advantage is that we have tied the customer with large volumes and longer contracting lengths. (Sales Director, Beta1)
Competitive advantage	• We want to be better than the competitors and this way get better price on our products than competitors. (Country General Manager, Gamma3)
What suppliers think Alpha wants	• I'm sure Alpha is after two things. One is that they want fabric costs to further decrease per produced paper tons … The other is driving both Alpha and suppliers to the direction of developing better solutions which would further contribute to larger and more efficient production. It is not only aiming to the lowest price, though it is there, of that I'm sure. (Vice President, Sales & Marketing, Delta1)

Goals for mills

Compared to purchasing department and suppliers, mills have probably the widest spectrum of goals for PBC, which is interesting since the mills were found to be the actor with the most negative perceptions of PBC. Contrary to suppliers, mills do not identify cooperation or transparency as benefits at all, though those were the biggest goal for suppliers. However, it is good to note that since mills and purchasing department are part of the same company, mills see purchasing department's goals as their goals too, though they do not always seem to agree with them. Similar to purchasing department, mills highlight that PBC would be financially beneficial, since it would lead to lower costs, cost-efficiency and savings (Table 11). They aim to get basic total costs to go down, so that euro per produced paper ton would go down and create savings. For example, the overall fabric costs are expected to decrease as a result of PBC, since less fabrics are used on a yearly basis. However, the mills make a clear distinction between the lowest price and lowest costs. As one of them explains, Alpha should not be targeting the lowest prices, since the low price itself is not enough if there is not sufficient performance. Furthermore, this illustrates that paying more for a better product is considered as an option, if that was to lead to lower costs and better cost-efficiency.

> *If it [higher prices] can be counterbalanced with longer running times, then the euro per ton price would be lower or in the same level, and we can still run them longer. Because, if we buy cheaper but change more often, the money spend increases, so it doesn't work, it needs to be optimized. (Operations Engineer, Mill6)*

Second goal mills identify is to be more innovative and to re-think the business. The current business takes only little improvements, and of which are debated whether those can even be seen as innovations. For example, radical innovations would be desirable, since those are seen to improve the quality and running time simultaneously with declining prices. Interviewees seem to emphasize that PBC could motivate suppliers to be more innovative, invest more in R&D and give them incentives to develop their business and products. Most of the interviewees see that the core goal of PBC is to motivate suppliers to be innovative, and all the other aspects such as cost-efficiency and savings would only come as a result of successful supplier innovations. Moreover, some interviewees also believe that PBC could activate people within Alpha to think and to develop further, rather than stopping when a good product is found. Some also say that innovation could take place as a result of cooperation, by taking the supplier on board with the development. As Mill 6 explains, it does not matter who is the source of the innovation or where it stems from as long as it has a good impact:

> *Somebody has to come up with an idea and it doesn't always need to be material. It can be a change in procedures or something else that brings as savings when it comes to raw materials, energy or labor input. (Operations Manager, Mill3)*

Third goal mills identify is longer running times. Especially from their perspective, the longer running times are seen as a goal worth fighting for; mills win more, the fewer the shutdowns. Since the primary goal for mills is to run as smoothly and efficiently as possible, one of the goals of PBC is to increase the running time and reduce the stops needed for fabric change. As one of the interviewees explains, the purpose of the fabric to the mills is that the fabrics would perform as well as possible in the process and so that those could run as long as possible. Nonetheless, one of the mills wondered if longer running times are aimed to only because the prices cannot be lowered anymore, and Alpha cannot come up with any other ideas to improve the

efficiency. Whatever the reason, mills seem to believe that longer running times are achievable goal which could also lead other benefits.

> *If we were able to run longer with more expensive fabric, it means that there's less time when the machine is shut down and that way we would make more tons, and the more tons we make the more revenue we get. The fabric would then cost a bit more, and the supplier would get some more, so there could be a win-win situation. (Operations Engineer, Mill6)*

If the fabrics were to run longer, this would reflect to the work done at the mills. Namely, if the fabrics run longer and the machines are run down less frequently, there is less work. As mentioned before, mills are concerned that PBC could cause more work for them, yet some also identify that PBC would decrease workload. Especially if there is a high demand in the mills and the machines are expected to run with full speed, longer running times with less shutdowns would be beneficial. Workload could also decrease in other areas too, since less fabrics in a year also mean that there would be less bills to handle in the same year. One of the interviewees also stated that if the amount of suppliers would decrease as a result of PBC, it would also likely decrease the workload. Currently, the mills do not seem to have time to just chat with suppliers, and hence if PBC was to decrease workload, the freed time could maybe be used to some other tasks.

> *On an annual basis, this type of machine line would mean easily a hundred of fabrics per year and a hundred of bills per year versus receiving only let's say twenty bills per year. There is already quite big of a difference there in the work it requires. (General Manager, Mill2)*

Similar to suppliers, mills see that purchasing department is after financial goals, such as cost-efficiency, lower costs and savings. As stated before, since mills and purchasing department are part of the same company, it is sometimes challenging to make a distinction between the goals of the mills and what mills think are purchasing department's goals. A few also identify that purchasing department is probably aiming to motivate suppliers to be more innovative and facilitate the tendering process. Besides, PBC is believed to have a positive impact on forecasting the fabric costs. Nevertheless, in some cases, mills find some of purchasing department's goals dubious, and as Mill1 argues:

Sure central purchasing's goal is only to have cheap products but we have to live with the whole package. So it doesn't need to be cheap if the performance is not there. (Production Manager, Mill1)

Table 11. Goals of PBC identified by the mills

Lower costs & cost-efficiency	• The biggest thing towards which it [PBC] should aim to is to lower fabric costs, so that we would use less fabrics on a yearly basis. (Senior Production Manager, Mill3)
Innovation & rethinking the business	• I hope that it [PBC] would activate to think and to find the best products and also to further develop the suppliers' product so that it won't stop when a good product is found, but rather if we see that there is still room for improvement we will work for it. (Operations Manager, Mill8)
Longer running times	• We win there if the time we waste in changing the fabrics could be minimized, meaning that the running time would increase. (Operations Engineer, Mill7)
Decreases workload	• If you need to change the fabrics less frequently, it means that there's less work in the stops. (Operations Manager, Mill8)
What mills think purchasing department wants	• I guess that central purchasing wants new ways to be more cost-efficient. On one hand they might think that there are potential that is not being used and on the other hand they might try to challenge the supplier to develop better products. (Engineer, Mill8)

6 Implications & conclusions

As the empirical findings show, it is clear that actors have different perceptions and expectations towards PBC, and that introducing an effective PBC is not easy. In this chapter, the results are discussed more in detail and reflected on the current literature, thus aiming to answer the research questions. Thereafter, both the theoretical and managerial implications are given, and the work is wrapped up with the limitations and ideas for future research. Taking a bottom-up approach on the research questions enables starting from the sub-questions and thereafter answering the main research question.

Interestingly, literature seems to identify only little prerequisites for PBC or how for example suppliers have reacted to PBC. Since the perceptions were categorized either negative, neutral or positive perceptions, the prevailing mindset could be identified. To answer the first sub-question, how do actors perceive PBC, the results were categorized either positive, neutral or negative. Strictly speaking, purchasing department's perceptions were mainly positive which is kind of understandable since the idea comes from them. Tate et al. (2010) confirms this by arguing that people who work at supply management tend to prefer PBC, especially if the subject is tangible (like a fabric) and the performance is simple to track down (as produced tons).

Contrary to purchasing department, mills had more negative perceptions and their overall attitude towards PBC was quite sceptical. Some mills argued that they do not like the idea since there are no previous experiences of PBC at hand, and the role of references from other mills and experience of early adopters seem to play a role whether it is feasible to introduce PBC (Bol & Moers 2010). In turn, suppliers fall between purchasing department and mills, since they were mainly neutral, by acknowledging the potential of PBC yet expressing their concerns over certain issues. Similarly, the literature identifies that the suppliers' perceived control over the input, level of trust and cooperation affects how willing the supplier is to engage in PBC (Selviaridis & Norrman 2014). However, it is good to keep in mind that perceptions of PBC are highly personal matters, as some interviewees noted.

To answer the second sub-question, what do the actors expect from PBC, illustrates the outlines of the contract. All the parties expect PBC to be trust-based and mutually beneficial, to include closer cooperation and communication than previously (Datta & Roy 2011; van der Valk & van Iwaarden 2011; Nätti et al. 2014), and the actors of the triad expect both contractual capabilities and well as relational capabilities from PBC (Hartmann et al. 2014). In line with Hartmann et al. (2014), it is up to actors involved how detailed contract they want to sign. It is interesting to note that all the interviewees agree that the contract should be well negotiated beforehand, though interviewees have little to say what exactly the contract should include.

Furthermore, purchasing department hopes that the suppliers would be capable and willing to engage in this new model and that the pricing needs to be formed based on a price list. As one of the purchasing department's interviewees stated, the supplier does not necessarily need to be similar to Alpha, but the targets need to be congruent and everyone needs to be willing to invest and do even challenging things to reach a mutual goal. In turn, suppliers especially emphasized that PBC should be mutually beneficial and that the contract should be designed so that it is still profitable for them. Similar to suppliers, mills expect the contract to have mutual trust and co-operation and similar to purchasing department, mills believe that certain maximum and/or minimum price needs to be agreed on. As the finding show, relational capabilities and contractual capabilities are intertwined (Hartmann et al. 2014): for example, suppliers expect the negotiations to target on mutual benefit (relational capability), which further contributes to the contracting details (contractual capabilities). Similarly, purchasing department expects the suppliers to have enough physical resources (contractual capabilities) as well as the willingness (relational capabilities) to engage in PBC.

Compared to perceptions and expectations, current literature identifies several barriers that require overcoming in order to transit from product-based contracting and pricing to performance-based contracting and pricing (e.g. Ng & Nudurupati 2010; Liinamaa et al. 2016). To answer the third sub-question, why is PBC seen challenging, the responses were evident; the biggest barriers for all the actors in the triad were change resistance, conflicting interests, designing a compensation system and increased workload. Additionally, purchasing department is con-

cerned about the undeveloped supplier offering, data management and inflexibility of the systems, while suppliers are concerned of the contract development and have a fear of increased risk, whereas mills are concerned of information silos. Though change resistance cannot be avoided, some change resistance is justified (Tate et al. 2010; Kleemann et al. 2012) and occurs by nature. After all, the new contracting model yields great risk for both buyer and supplier, and it is thus understandable that parties feel worried about the change.

Besides, though actors' goal in theory would target mutuality, in practice it is very likely that the actors have conflicting interests (Tate et al. 2010; Van der Valk and van Iwaarden 2011). The empirical evidence of this study is in unison with Tate et al.'s (2010) findings, where the supplier is given conflicting messages from different actors, challenging the cooperation. Hence, it is clear that the buyer is not necessarily a coherent unit, and as the study show, mills and purchasing department can have interests that are very far from each other, and taking a dyadic approach would probably have given totally different results. In the worst case, if taking a dyadic approach, the mills' opinions would be excluded, making mills feel that the changes are pushed top-down and hence hindering or even preventing the effective implementation of PBC.

The conflicting interests are a result of different incentives and purposes of purchasing department, suppliers and mills: purchasing department has more strategic look of the business, thus targeting developing the business and thus gaining the competitive advantage. On the contrary, mills are responsible for the operational work, and their purpose is to produce reliably and certainly as possible. Sometimes the mills seemed to be more in the same line with suppliers rather than purchasing department. Wynstra et al. (2015) also agree to the point by admitting that aligning the interests between the actors of the triad is difficult and that interest alignment has an effect in specifying the performance level. Hence, the conflicting interest should be overcome to be able to cooperate in an efficient manner (Ssengooba et al. 2012; Kleemann & Essig 2013).

Interestingly, suppliers and mills are concerned that the price would be the main driver of the business, whereas purchasing department did not. Furthermore, supplier fear that PBC would increase risk for them, and though there seems to be trust-based relationship between the actors, especially suppliers find it hard to believe Alpha's words of better performance would lead to

better compensation. As the suppliers say, they have not had the experience of Alpha paying more for better performance, quite the contrary. This raises the question that how the purchasing department is going to convince suppliers that they are being compensated and how much they are going to exploit their purchasing power over the suppliers (Kindström & Kowalkowski 2014). Since it is somewhat contradictory, that the purchasing department seems to think that PBC is going to be applied no matter what, though simultaneously they hope to find a supplier who is head over heels in PBC and willing to take the risk.

The fourth sub-question, why is PBC seen beneficial, was clearly more demanding question for the interviewees than why is PBC seen challenging. Actors of the triad found it easier to tell what would be the benefits for the other actors, but sometimes struggled to identify benefits for themselves. For example purchasing department believed that with PBC suppliers would differentiate themselves especially from Asian suppliers, though which suppliers did not identify as a benefit per se. On the contrary, mills stated that purchasing department mainly after lower costs, better cost-efficiency or other financial targets, but did not find rethinking sourcing as the benefits purchasing department would be after.

When it comes to actors thoughts of the benefits, in general, PBC is believed to allow actors to work more effectively and with lower costs. Financial targets, longer running times and innovation were identified as the goals for purchasing department and mills, whereas suppliers identified increased transparency and cooperation, increased volume and competitive advantage as their goals for PBC. Purchasing department was clearly thrilled about PBC and its ability to revolutionize the laws of sourcing, strengthening their position at the markets. Though PBC is believed to benefit all the actors financially (e.g. Hypko et al. 2010B; Holmbom et al. 2014), suppliers do not believe PBC would significantly affect their profit, but they rather believe that longer contracts and possibly bigger volume would be the main benefits for them. To suppliers' opinion, PBC could be a possibility to consider the quality of the fabric as the primary attribute and prices only secondary (Hypko et al. 2010B) hence alleviating the pressure on prices. Closer cooperation between the actors of the triad supports mutual learning (Nätti et al. 2014) and is believed to incentivize for joint development. Eventually, PBC is hoped to give competitive

advantage for both buyer and supplier (Hypko et al. 2010B; Howard et al. 2016; Glas & Kleemann 2017).

The main idea, and simultaneously the challenge of PBC, is how to successfully transit from the traditional product-based business model to performance-based business model where supplier is compensated based on the achieved results (Kleemann et al. 2012). Since the results to sub-questions are given, the main research question, how to effectively introduce PBC, can now be answered (Figure 9). Taking these findings together, it can be said that effective introduction of PBC requires understanding the parties' perceptions and expectations to acknowledge the current situation. On one hand it is vital to identify barriers that could hinder the transition from procuring simple product to procuring complex performance but on the other hand it is also vital to identify the benefits that drive towards the change. Based on these deductions, it can be said that if a company wants to effectively introduce PBC within their company, they need to do the preliminary work to understand the current situation, to tackle the barriers and work towards a clear target with well-thought contract. Fundamentally, PBC balances the higher risk against the higher value and rewards (Gruneberg et al. 2007; Selviaridis & Norrman 2015), of course aiming to increase the rewards more than related costs.

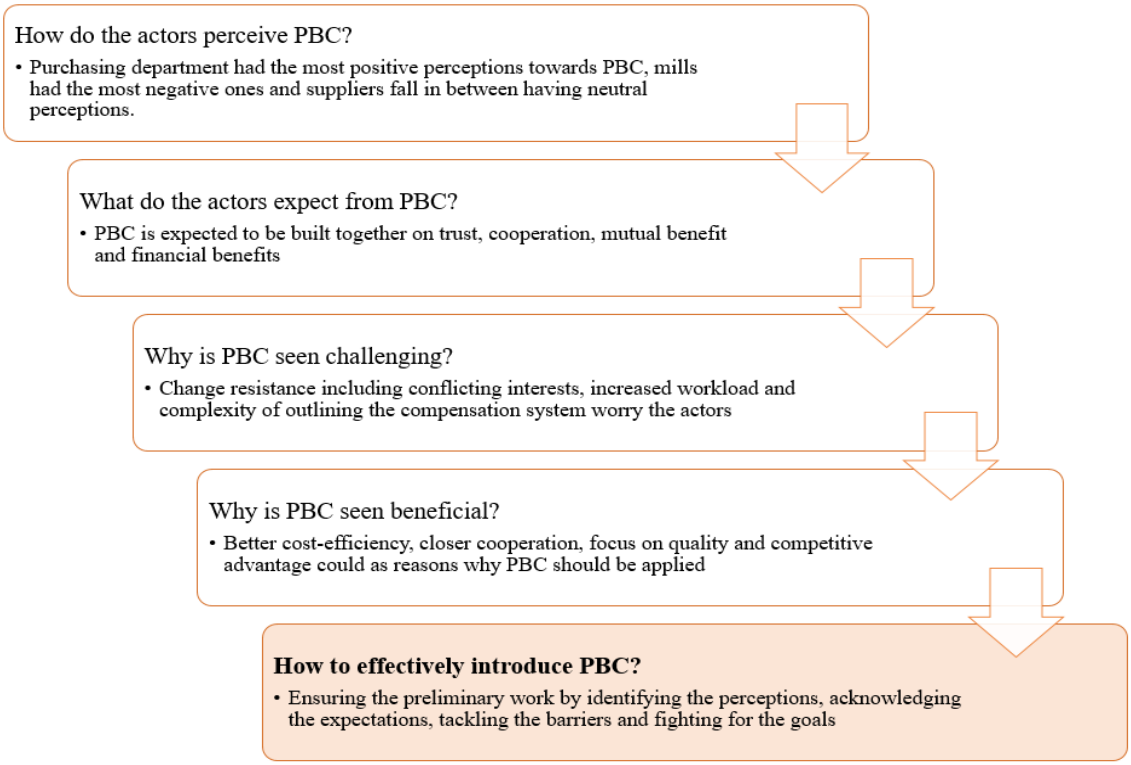

Figure 9. Answering the research questions

6.1 Theoretical implications

The study contributes to the narrow empirical and conceptual understanding of performance-based contracting by examining the topic from the triadic perspective in pulp and paper industry. Both PBC and inter-organizational triads have received limited recognition in operations and supply management literature (Selviaridis & Wynstra 2015; Wynstra et al. 2015; Essig et al. 2016; Vedel et al. 2016) and due to PBC's ability to question the boundaries of organizations and ways of organizing knowledge (Ng et al. 2013), PBC is found extremely interesting research topic. Taken together, the results of the study contribute to the literature especially in three ways. First, the study is found to contribute to both the empirical evidence as well as the theoretical knowledge of PBC by examining the perceptions and expectations of the actors, of which the previous literature has not studied at all. Secondly, the study takes a triadic approach on PBC in an industry it has not studied before, elaborating how pulp and paper industry see PBC. And thirdly, the triadic approach is supported and contributed to by proving that the buyer is not necessarily a coherent unit.

While the literature seems to have studies of moving towards PBC, those seem to lack both theoretical focus (Essig et al. 2016) as well as the empirical evidence of the topic (Glas et al. 2011; Kleemann et al. 2012). Hence examining the perceptions and expectations of the actors give new insights can offer new opportunities to study PBC (Essig et al. 2016). The study supports the theory of Hartmann et al. (2014) and especially present the interconnectedness of the relational and contractual capabilities. The empirical evidence shows that the actors expect, first and foremost, PBC to be built on mutual trust, which then facilitates the contractual capabilities such as designing a compensation model that sufficiently benefits both parties. It is worth noting that though interviewees identified both mills and suppliers to resist the change quite equally, the mills possessed more negative perceptions compared to suppliers. As a result, convincing suppliers might be easier than thought before, yet convincing mills might require more effort than thought before. Though actors feel that their cooperation and trust is already in a quite good level, they see that some improvements can be made. And contrary to Hypko et al. (2010B), the buyer has the interest to purchase performance rather than products.

Taking pulp and paper industry under examination is also relevant, since PBC has not been studied from it before. Compared to defence, one of the industries where PBC has been studied the most (e.g. Howards et al. 2016), pulp and paper industry share some characteristics for PBC: both are large-scale and capital intensive industries (Xiang et al. 2017), where the supplier often takes care of the maintenance, repair and overhaul. Since the pulp and paper industry is seen conservative and slow-moving industry, the changes in there are seen often more as a threat as an opportunity. Nevertheless, the industry is about to wake up to the fact that lowering prices is not feasible method for competition, but that something has to be done differently. Hence, there is no reason why pulp and paper industry should not follow the same path as aerospace and defence, where PBC has led to motivate suppliers to develop their offerings and thus improved the efficiency (Kim et al. 2007). As one of the suppliers presented, PBC could allow them to sell Alpha systems or bigger solutions rather than just fabrics. Therefore, this study can be seen for example as a prelude for the revolution of PBC in pulp and paper industry.

PBC is mainly studied from the dyadic perspective (Tate et al. 2010) and not so much from the triadic perspective (van der Valk & van Iwaarden 2011; Wynstra et al. 2015), and thus taking a triadic approach sheds more light on complex relationships. As the findings show, the buying organization presented is not necessarily one coherent unit with mutual objectives. Dyadic approach might leave this aspect unnoticed, and can thus bias the buyer's responses, especially if several departments within the buying organizations take part in PBC process. In this case, taking a dyadic approach would have given probably biased buyer perspective, or a blind eye as Choi and Wu (2009) present, since mills and purchasing department are so different from each other. For example, mills themselves implied that sometimes it is easier to find mutual goals with suppliers than purchasing department. Tying together PBC and triads is especially important since the production data comes from the mills and based on the calculus agreed with purchasing department, the supplier is being compensated. The study also adheres to Choi and Wu (2009) and Wynstra et al.'s (2015) suggestions to study triads more especially in the operations and supply management and further supports the findings of Tate et al. (2010).

6.2 Managerial implications

From managerial perspective, the study offers valuable insight especially on the work that needs to be done to effectively introduce PBC. Here, understanding the current situation and prevailing perceptions allows companies to take into considerations variety of aspects in order to introduce PBC effectively. For example, purchasing department seemed to be surprised of the amount of resistance of PBC among suppliers and mills. Besides, identifying why PBC is seen challenging presents the barriers and areas of concerns of different parties enables executives to tackle these barriers. If the barriers are not bore in mind and actions are taken without considering the suppliers and mills' perspective, the purchasing department not only deteriorates the relationships to suppliers and mills, but also slows down or even prevents successful implementation of PBC. In sum, trust, transparency and other soft factors play a key role, probably even bigger than first thought, since the transition process is also about change management.

The managers should keep in mind that a benefit for one can be a challenge for another; as one of the interviewees stated, there are like separate bubbles in which the actors live in, yet especially the managers have to have the ability to understand how the people within the other bubbles think. Understanding the expectations and concerns of the others and acting upon them has a great possibility to lessen the change resistance. Besides, as the suppliers and mills sometimes had difficulties in understanding the advantages of PBC, the managers play a great role in visualizing the value of PBC to the other actors. For example, workshops or other means could be used to spread the word and to explain why Alpha wants to engage in PBC. Another suggestion would be to form cross-functional or inter-organizational teams to take care of PBC. Supported by the literature and findings, the relational capabilities including trust and reciprocity among others cannot be emphasized enough, especially in a conservative and slow-moving industry as pulp and paper industry.

Additionally, the questions whether Alpha is willing to pay more and how much for better performance, need to be thought well in advance. As the findings show, majority of the suppliers and some mills believe that Alpha is not willing to pay more for better performance, though purchasing department states that they indeed are. Though purchasing department seems to acknowledge the fact that suppliers are skeptical, little was given on how to convince the other actors to believe this new model. Besides, it is not only convincing the others, but also changing the attitude within Alpha, so that if and when the supplier is able to produce better performance, Alpha can keep its word and pay the supplier more. Here, designing a calculus for the compensation model and sharing it with the relevant actors would be beneficial. The calculus could be designed to go first in parallel with the current production to set some sort of a base, and then the calculus could be honed upwards or downwards.

Supported by the findings of this study, the logical next step, and a strong recommendation, is to organize a pilot and embrace the results. The interviewees of the purchasing department also agree that Alpha (and why not other actors in the same industry) have a tendency to think, plan and map ideas too long. Yes, the phrase is that “well begun is half done”, but as one of the interviewees stated, the purchasing department and in the industry in general, there is a tendency to mull over the ideas too long. Hence, the PBC should be piloted with one or more chosen

suppliers and with a chosen mills, in a feasible and safe environment for joint development and learning. With the help of shared system and initial discussion with Beta, Beta could work as a good supplier to start the negotiations with. Choosing the right mill to pilot probably requires extending the investigations, though based on the interviews, Mill2 could be one of the potential mills.

6.3 Limitations & future research

When it comes to findings of this study, certain limitations need to be acknowledged. First of all, the chosen research method and data collection can be seen as a limitation. As stated before, the study was conducted as a qualitative embedded single case study, and the data included 25 interviewees from the purchasing department, three suppliers and eight mills. Choosing these actors might limit the results, and for example having only one or two interviewees from each mill does not necessarily represent the opinions of the whole mill. Similarly, some suppliers were left out, yet who could have had totally opposing views compared to the ones who were interviewed. Therefore, the future research could reassess the actors in the triad, and possibly cover either wider spectrum of interviewees from each actors or totally new actors. This would shed more light on perceptions, expectations, barriers and goals of the actors thus contributing to effective introduction of PBC. Besides, the study could be conducted as a multiple case study, where the same aspects, perceptions, expectations, barriers and goals could be examined in another company or in a another country and then compared to the findings of this study. Taking multiple case study would offer more generalizable and accurate theory, since those allow comparing cases with each other (Eisenhardt & Graebner 2007).

Another aspect that can be seen as a limitation is that the study takes short-term perspective by presenting only the prevailing situation with actors' current perceptions, expectation, barriers and goals. Some of the interviewees were not familiar with the topic beforehand, and hearing from PBC for the first time did not give them much time to think about their responses. Besides, since almost none of the interviewees had previous experiences of PBC, the answers were based on their current understanding of the topic rather than practical experiences. Hence, the future research could take long-term approach on PBC, and for example study how the perceptions

and understanding of the topic change in parallel with the transition process. Long-term approach would probably also illustrate how the barriers to PBC are perceived throughout the process, and maybe identify which barriers are crucial in each process phase and whether the initial barriers indeed exist.

In addition to previously mentioned areas of future research, the emerging topic of preferred customer could be studied in pulp and paper industry. To purchasing department's opinion, suppliers are neither proactive nor innovative enough, though especially the purchasing department was confident that they are the preferred customer for the suppliers, and hence they expect suppliers to act accordingly. Though the suppliers seemed to see Alpha as an important customer and the relationship with Alpha good in general, only one supplier implied that Alpha is a superior customer for them. Hence, the future study could focus on do the suppliers perceive Alpha as a preferred compared to their other customers or how Alpha could attain the status of preferred customer in the eyes of the supplier. Moreover, it would be fascinating to see how the role of preferred customer further contributes to relationship between the actors or to performance-based contracting.

References

Aarikka-Stenroos, L. & Jaakkola, E. (2012). Value co-creation in knowledge intensive business services: A dyadic perspective on the joint problem solving process. *Industrial Marketing Management, 41*(1), 15–26

Andersson, H., Harju, T. & Larjomaa T. (2002). Value creation - it is time to get serious. *Pulp & Paper International, 44*(2), 33-35

Argyres, N. & Mayer, K. I. (2007). Contract design as a firm capability: An integration of learning and transaction cost perspectives. *Academy of Management Review, 32*(4), 1060-1077

Benzer, J. K., Young, G. J., Burgess, J. F., Baker, E., Mohr, D. C., Charns, M. P. & Kaboli, P. J. (2014). Sustainability of Quality Improvement Following Removal of Pay-for-Performance Incentives. *Journal of General Internal Medicine, 29*(1), 127–132

Berkowitz, D., Gupta, J. N. D., Simson, J. T. & McWilliams, J. (2003). Performance Based Logistics, Center for the Management of Science and Technology, University of Alabama in Huntsville, Huntsville

Bol, J. C. & Moers, F. (2010). The dynamics of incentive contracting: The role of learning in the diffusion process. *Accounting, Organizations and Society, 35*(8), 721-736

Bonnemeier, S., Burianek, F. & Reichwald, R. (2010). Revenue models for integrated customer solutions: Concept and organizational implementation. *Journal of Revenue and Pricing Management, 9*(3), 228-238.

Brax, S. (2005). A manufacturer becoming service provider – challenges and a paradox. *Managing Service Quality, 15*(2), 142-155

Brown, T. L. & Potoski, M. (2003). Managing contract performance: A transaction costs approach. *Journal of Policy Analysis and Management, 22*(2), 275-297

Brucker, D. & Stewart. M. (2011). PBC Within a State Substance Abuse Treatment System: A Preliminary Exploration of Differences in Client Access and Client Outcomes. *The Journal of Behavioral Health Services & Research, 38*(3), 383-397

Buchanan, N. & Klingner, D. E. (2007). PBC: are we following the mandate? *Journal of Public Procurement, 7*(3), 301-332

Caldwell, N. & Howard, M. (2014). Contracting for complex performance in markets of few buyers and sellers. *International Journal of Operations & Production Management, 34*(2), 270-294

Caldwell, N., Roenrich, J. K. & Davies, A. C. (2009). Procuring complex performance in construction: London Heathrow Terminal 5 and a Private Finance Initiative hospital. *Journal of Purchasing & Supply Management, 15*(3), 178–186

Choi, T. Y. & Wu, Z. (2009). Taking the leap from dyads to triads: Buyer–supplier relationships in supply networks. *Journal of Purchasing & Supply Management, 15*(4), 263–266

Christianson, J. B., Leatherman, S. & Sutherland, K. (2008). Lessons from evaluations of purchaser pay-for-performance programs: A review of the evidence. *Medical Care Research and Review, 65*(6), 5S-35S

Claassen, M. J. T., van Weele, A. J. & van Raaij, E. M. (2008). Performance, Outcomes and Success Factors of Vendor Managed Inventory (VMI). *Supply Chain Management: An International Journal, 13*(6), 406-414

Colclough, N. (2000). The big just keep on getting bigger. *Pulp & Paper International, 42*(9), 17-23

Collins-Camargo, C., McBeath, B. & Ensign, M. (2011). Privatization and PBC in Child Welfare: Recent Trends and Implications for Social Service Administrators. *Administration in Social Work, 35*(5), 494-516

Datta, P. P. & Roy, R. (2011). Operations Strategy for the Effective Delivery of Integrated Industrial Product-service Offerings: Two Exploratory Defense Industry Case Studies. *International Journal of Operations & Production Management, 31*(5), 579–603

Datta, P. P. & Roy, R. (2013). Incentive issues in performance-based outsourcing contracts in the UK defence industry: a simulation study. *Production Planning & Control, 24*(4-5), 359-374

Devries, H. J. (2005). Performance-Based Logistics - Barriers and Enablers to Effective Implementation. *Defense Acquisition Review Journal, 11*(3), 243–254

Doerr, K., Lewis, I. & Eaton, D. R. (2005). MEASUREMENT ISSUES IN PERFORMANCE-BASED LOGISTICS. *Journal of Public Procurement, 5*(2), 164-186

Dubois, A. & Gadde, L.-E. (2002). Systematic combining: an abductive approach to case research. *Journal of Business Research, 55*(7), 553– 560

Dubois, A. & Gadde, L.-E. (2014). "Systematic combining"—A decade later. *Journal of Business Research, 67*(6), 1277-1284

Easton, G. (2010). Critical realism in case study research. *Industrial Marketing Management, 39*(1), 118-128

Eisenhardt, K. M. (1989). Building Theories from Case Study Research. *Academy of Management Review, 14*(4), 532-550

Eisenhardt, K. M. & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal, 50*(1), 25–32

Eldridge, C. & Palmer, N. (2008). Performance-based payment: some reflections on the discourse, evidence and unanswered questions. *Health Policy and Planning, 24*(3), 160–166

Essig, M., Glas, A. H., Selviaridis, K. & Roehrich, J. K. (2016). PBC in business markets. *Industrial Marketing Management, 59*, 5–11

Faith, J., Panzarella, C., Spencer, R. C., Williams, C., Brewer, J. & Covone, M. (2010). Use of PBC to improve effective use of resources for publicly funded residential services. *The Journal of Behavioral Health Services & Research, 37*(3), 400-8

Fearnley, N., Bekken, J.-T. & Norheim, B. (2004). Optimal performance-based subsidies in Norwegian intercity rail transport. *International Journal of Transport Management, 2*(1), 29–38

Fliess, S. & Lexutt, E. (2017). How to be successful with servitization – Guidelines for research and Management. *Industrial Marketing Management*, https://doi.org/10.1016/j.indmarman.2017.11.012 (article in press)

Gates, L. B., Klein, S. W., Akabas, S. H., Myers, R., Schwager, M. & Kaelin-Kee, J. (2004). PBC: Turning vocational policy into jobs. *Administration and Policy in Mental Health, 31*(3), 219-240

Gioia, D. A., Corley, K. G. & Hamilton, A. L. (2013). Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology. *Organizational Research Methods, 16*(1), 15-31

Glas, A., Hofmann, E. & Eßig, M. (2011). Performance-based logistics: a portfolio for contracting military supply. *International Journal of Physical Distribution & Logistics Management, 43*(2), 97-115

Greiling, D. (2006). Performance Measurement: A Remedy for Increasing the Efficiency of Public Services? *International Journal of Productivity and Performance Management, 55*(6), 448-465

Gruneberg, S., Hughes, W. & Ancell, D. (2007). Risk under PBC in the UK construction sector. *Construction Management and Economics, 25*(7), 691-699

Guajardo, J. A., Cohen, M. A., Kim, S.-H. & Netessine, S. (2012). Impact of PBC on Product Reliability: An Empirical Analysis. *Management Science, 58*(5), 961–979

Hakala, T. & Harlin, A. (2010). Case Study of the Out-of-Plane Shear Strength Measurement of Paper Machine Clothing. *Textile Research Journal, 80*(19), 2066–2080

Halinen, A. & Törnroos, J-Å. (2005). Using case methods in the study of contemporary business networks. *Journal of Business Research, 58*(9), 1285-1297

Hartmann, A., Roehrich, J., Frederiksen, L. & Davies, A. (2014). Procuring complex performance: the transition process in public infrastructure. *International Journal of Operations & Production Management, 34*(2), 174-194

Hensher, D. A. & Stanley, J. (2008). Transacting under a performance-based contract: The role of negotiation and competitive tendering. *Transportation Research Part A 2008, 42*(9), 1143-1151

Hirsjärvi, S., Remes, P. & Sajavaara, P. (2009). Tutki ja kirjoita. 15th – 16th edition, Kustannusosakeyhtiö Tammi, Helsinki

Holmbom, M., Bergquist, B. & Vanhatalo, E. (2014). Performance-based logistics – an illusive panacea or a concept for the future? *Journal of Manufacturing Technology Management, 25*(7), 958-979

Homburg, C. & Stebel, P. (2009). Determinants of contract terms for professional services. *Management Accounting Research, 20*(2), 129–145

Hooper, L. (2008). Paying for performance: Uncertainty, asymmetric information and the payment model. *Research in Transportation Economics, 22*(1), 157-163

Howard, M., Wu, Z., Caldwell, N. Jia, F. & König, C. (2016). PBC in the defence industry: Exploring triadic dynamics between government, OEMs and suppliers. *Industrial Marketing Management, 59,* 63–75

Hypko, P., Tilebein, M. & Gleich, R. (2010A). Clarifying the concept of PBC in manufacturing industries. *Journal of Service Management, 21*(5), 625-655

Hypko, P., Tilebein, M. & Gleich, R. (2010B). Benefits and uncertainties of PBC in manufacturing industries. *Journal of Service Management, 21*(4), 460-489

Järvensivu, T. & Törnroos, J.- Å. (2010). Case study research with moderate constructionism: Conceptualization and practical illustration. *Industrial Marketing Management, 39*(1), 100-108

Kim, S., Cohen, M. A. & Netessine, S. (2007). Performance contracting in after-sales service supply chains. *Management Science, 53*(12), 1843-1858

Kindström, D. & Kowalkowski, C. (2014). Service innovation in product-centric firms: a multidimensional business model perspective. *Journal of Business & Industrial Marketing, 29*(2), 96-111

Kleemann, F. C. & Essig, M. (2013). A providers' perspective on supplier relationships in PBC. *Journal of Purchasing & Supply Management, 19*(3), 185–198

Kleemann, F. C., Glas, A. & Essig, M. (2012). Public Procurement through Performance-based Logistics: Conceptual Underpinnings and Empirical Insights. *Journal of Public Procurement, 12*(2), 151-188

Kumar, R. & Markeset, T. (2007). Development of performance-based service strategies for the oil and gas industry: a case study. *Journal of Business & Industrial Marketing, 22*(4), 272–280

Liinamaa, J., Viljanen, M., Hurmerinta, A., Ivanova-Gongne, M., Luotola, H. & Gustafsson, M. (2016). Performance-based and functional contracting in value-based solution selling. *Industrial Marketing Management, 59,* 37–49

Lindkvist, L. (1996). PERFORMANCE BASED COMPENSATION IN HEALTH CARE — A SWEDISH EXPERIENCE. *Financial Accountability & Management, 12*(2), 89-106

Martin, L. L. (2002). PBC for human services: Lessons for public procurement? *Journal of Public Procurement, 2*(1), 55-71

Martin, L. L. (2007). PBC for human services: a proposed model. *Public Administration Quarterly, 31*(2), 130-158

Meehan, J., Menzies, L. & Michaelides, R. (2017). The long shadow of public policy; Barriers to a value-based approach in healthcare procurement. *Journal of Purchasing and Supply Management, 23*(4), 229-241

Mirzahosseinian, H. & Piplani, R. (2011). A study of repairable parts inventory system operating under performance-based contract. *European Journal of Operational Research, 214*(2), 256-261

Mouzas, S. (2016). Performance based contracting in long-term supply relationships. *Industrial Marketing Management, 59,* 50-62

Ng, I. C. L., Ding, D. X. & Yip, N. (2013). Outcome-based contracts as new business model: The role of partnership and value-driven relational assets. *Industrial Marketing Management, 42*(5), 730-743

Ng, I. C. L., Maull, R. & Yip, N. (2009). Outcome-based contracts as a driver for systems thinking and service-dominant logic in service science: Evidence from the defense industry. *European Management Journal, 27*(6), 377– 387

Ng, I. C. L. & Nudurupati, S. S. (2010). Outcome-based service contracts in the defense industry – mitigating the challenges. *Journal of Service Management, 21*(5), 656-674

Nowicki, D., Randall, W.S. & Gorod, A. (2010). A framework for performance based logistics: a system of systems approach. International Congress on Ultra Modern Telecommunications and Control Systems and Workshops, Moscow, 681-692

Nowicki, D., Sauser, B., Randall, W. & Lusch, R. (2018). Service-Dominant Logic and PBC: A Systems Thinking Perspective. *Service Science, 10*(1), 12-24

Nullmeier, F. M. E., Wynstra, F. & van Raaij, E. M. (2016). Outcome attributability in PBC: Roles and activities of the buying organization. *Industrial Marketing Management, 59,* 25-36

Nurmi, V. (2007). Future trends of HRD in the Finnish pulp and paper industry. *Human Resource Development International, 10*(1), 107-113

Nätti, S., Pekkarinen, S., Hartikka, A. & Holappa, T. (2014). The intermediator role in value co-creation within a triadic business service relationship. *Industrial Marketing Management, 43*(6), 977-984

Piekkari, R., Plakoyiannaki, E. & Welch, C. (2010). 'Good' case research in industrial marketing: Insights from research practice. *Industrial Marketing Management, 39*(1), 109–117

Pinnington, B. D., Meehan, J. & Scanlon, T. (2016). A grounded theory of value dissonance in strategic relationships. *Journal of Purchasing and Supply Management, 22*(4), 278-288

Pätäri, S., Tuppura, A., Toppinen, A. & Korhonen, J. (2016). Global sustainability megaforces in shaping the future of the European pulp and paper industry towards a bioeconomy. *Forest Policy and Economics, 66*, 38-46

Randall, W. S., Hawkins, T. G., Haynie, J. J., Nowicki, D. R., Armenakis, A. A. & Geary, S. R. (2015). Performance-Based Logistics and Interfirm Team Processes: An Empirical Investigation. *Journal of Business Logistics, 36*(2), 212–230

Randall, W. S., Nowicki, D. R. & Hawkins, T. G. (2011). Explaining the effectiveness of performance-based logistics: A quantitative examination. *International Journal of Logistics Management, 22*(3), 324-348

Roels, G., Karmarkar, U. S. & Carr, S. (2010). Contracting for Collaborative Services. *Management Science, 56*(5), 849-863

Salo, A., Tähtinen, J. & Ulkuniemi, P. (2009). Twists and turns of triadic business relationship recovery. *Industrial Marketing Management, 38*(6), 618-632

Selviaridis, K. & Norrman, A. (2014). PBC in service supply chains: A service provider risk perspective. *Supply Chain Management, 19*(2), 153-172

Selviaridis, K. & Norrman, A. (2015). PBC for advanced logistics services: Challenges in its adoption, design and management. *International Journal of Physical Distribution & Logistics Management, 45*(6), 592-617.

Selviaridis, K. & Wynstra, F. (2015). PBC: a literature review and future research directions. *International Journal of Production research, 53*(12), 3505-3540

Sengupta, S., Niranjan, T. T. & Krishnamoorthy, K. (2018). Trends and directions in service triads research. *International Journal of Physical Distribution & Logistics Management, 48*(3), 333-360

Shaw, M. (2005). Mills Seek Broader Market Appeal with Paper Machine Clothing Choice. *Pulp & Paper, 79*(11), 50-57

Shen, Y. (2003). Selection Incentives in a Performance-Based Contracting System. *Health Services Research, 38*(2), 535-552

Sols, A. & Johannesen, L. H. (2013). The role of transition contracts in performance-based logistics initiatives. *Systems Engineering, 16*(4), 453-463

Sols, A., Nowicki, D. & Verma, D. (2007). Defining the Fundamental Framework of an Effective Performance-Based Logistics (PBL) Contract. *Engineering Management Journal, 19*(2), 40-50

Sols, A., Nowicki, D. & Verma, D. (2008). N-dimensional effectiveness metric-compensating reward scheme in performance-based logistics contracts. *Systems Engineering, 11*(2), 93-106.

Ssengooba, F., McPake, B. & Palmer, N. (2012). Why PBC failed in Uganda - An "open-box" evaluation of a complex health system intervention. *Social Science & Medicine, 75*(2), 377-383

Straub, A. (2007). Performance-based maintenance partnering: a promising concept. *Journal of Facilities Management, 5*(2), 129-142

Straub, A. (2009). Cost savings from performance-based maintenance contracting. *International Journal of Strategic Property Management, 13*(3), 205-217

Sumo, R., van der Valk, W., Duysters, G. & van Weele, A. (2016). Using performance-based contracts to foster innovation in outsourced service delivery. *Industrial Marketing Management, 59*, 12-24

Tate, W. L., Ellram, L. M., Bals, L., Hartmann, E. & van der V, W. (2010). An Agency Theory perspective on the purchase of marketing services. *Industrial Marketing Management, 39*(5), 806–819

Tavory, I. & Timmermans, S. (2012). Theory Construction in Qualitative Research: From Grounded Theory to Abductive Analysis. *Sociological Theory, 30*(3), 167–186

Tavory, I. & Timmermans, S. (2014). Abductive Analysis: Theorizing Qualitative Research. The University of Chicago Press, Chicago and London

Terho, H., Eggert, A., Ulaga, W., Haas, A. & Böhm, E. (2017). Selling Value in Business Markets: Individual and Organizational Factors for Turning the Idea into Action. *Industrial Marketing Management, 66,* 42-55

Terho, H., Haas, A., Eggert, A. & Ulaga, W. (2012). 'It's almost like taking the sales out of selling'— towards a conceptualization of value-based selling in business markets. *Industrial Marketing Management, 41*(1), 174–185

Tineo, L. (2007). Procurement Issues in Performance-based Contracts: The World Bank Experience with Output-based Aid Subsidies. *Journal of Public Procurement, 7*(1), 62-83

Toppinen, A., Pätäri, S., Tuppura, A. & Jantunen, A. (2017). The European pulp and paper industry in transition to a bio-economy: A Delphi study. *Futures, 88,* 1-14

Tuck, L. (2004). Fixing MRO procurement. *Frontline Solutions, 5*(2), 22-24

Töytäri, P., Rajala, R. & Alejandro, T. B. (2015). Organizational and institutional barriers to value-based pricing in industrial relationships, *Industrial Marketing Management, 47*, 53-64

Ulaga, W. & Kohli, A. K. (2018). The role of a solutions salesperson: Reducing uncertainty and fostering adaptiveness. *Industrial Marketing Management, 69,* 161-168

Van der Valk, W. & van Iwaarden, J. (2011). Monitoring in service triads consisting of buyers, subcontractors and end customers. *Journal of Purchasing and Supply Management, 17*(3), 198-206

Van Maanen, J., Sørensen, J. B. & Mitchell, T. R. (2007). Introduction to Special Topic Forum: The Interplay between Theory and Method. *The Academy of Management Review, 32*(4), 1145-1154

Van Mossel, H.-J. & van der Valk, W. (2008). Securing Customer Satisfaction through Component Service Specifications: Purchasing Maintenance Services for Social Rented Housing. *Journal of Purchasing and Supply Management, 14*(4), 241-252.

Vedel, M., Holma, A.-M. & Havila, V. (2016). Conceptualizing inter-organizational triads. *Industrial Marketing Management, 57,* 139–147

Visnjic, I., Jovanovic, M., Neely, A. & Engwall, M. (2017). What brings the value to outcome-based contract providers? Value drivers in outcome business models. *International Journal of Production Economics, 192*, 169–181

Wagner, S. M., Lukassen, P. & Mahlendorf, M. (2010). Misused and missed use — Grounded Theory and Objective Hermeneutics as methods for research in industrial marketing. *Industrial Marketing Management, 39*, 5–15

Wynstra, F., Spring, M. & Schoenherr, T. (2015). Service triads: A research agenda for buyer–supplier–customer triads in business services. *Journal of Operations Management, 35*, 1-20

Xiang, Y., Zhu, Z., Coit, D. W. & Feng, Q. (2017). Condition-based maintenance under performance-based contracting. *Computers & Industrial Engineering, 111*, 391-402

Yin, R. K. (2018). Case Study Research and Applications – Design and Methods. 6th edition, Sage Publications, Los Angeles

Appendices

Appendix 1. Interview questions

A list of themes that are being discussed during each interview is presented below. Each theme included more or less precise questions, depending on the interviewees' responses and knowledge of the topic. The questions did not necessarily follow precise order, but were asked on a natural sequence as the interview proceeded. Additionally, complementary questions were asked if found suitable.

Interview questions

1. What is your name, background and current position?
2. Do you have previous experiences of PBC?
3. What is the goal of PBC for you? For the other actors?
4. How do you think PBC would effect on your supplier base, relationships and contract design?
5. How would you describe your prerequisites, expectations and attitudes towards PBC?
6. What are the possible barriers for you? For the other actors?
7. Who do you think resists PBC the most? Why?
8. Do you see that there is a threat of opportunism in PBC?
9. How would you describe the role of trust?
10. How do you see the innovation in and its importance on PBC?
11. How do you currently measure performance?
12. What do you think are suitable performance measures for PBC?
13. How would you describe the communication and cooperation with other actors?
14. How easy it is for you to understand your own needs and others' needs? How easy it is for others to understand your needs?