

THESIS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

# Organisation of Purchasing and Buyer-Supplier Relationships in Large Construction Companies

MIKAEL FRÖDELL

Department of Civil and Environmental Engineering  
Division of Construction Management  
CHALMERS UNIVERSITY OF TECHNOLOGY  
Göteborg, Sweden 2014

Organisation of Purchasing and Buyer-Supplier Relationships in Large  
Construction Companies

Mikael Frödell

ISBN 978-91-7597-043-1

© Mikael Frödell, 2014

Doktorsavhandlingar vid Chalmers tekniska högskola

Ny serie Nr 3724

ISSN 0346-718X

Department of Civil and Environmental Engineering

Division of Construction Management

Chalmers University of Technology

SE-412 96 Göteborg

Sweden

Telephone +46 (0)31 772 10 00

[www.chalmers.se](http://www.chalmers.se)

Chalmers reproservice

Göteborg, Sweden 2014

# Organisation of Purchasing and Buyer-Supplier Relationships in Large Construction Companies

MIKAEL FRÖDELL

Department of Civil and Environmental Engineering

Division of Construction Management

Chalmers University of Technology

## Abstract

Large construction companies purchase 70-80 per cent of their turnover from material and service suppliers, rendering their purchasing processes and practices crucial for achieving profitability and a competitive edge. However, the organisational structure of these companies, where purchasing is conducted in both the central purchasing department and in the projects, makes purchasing a challenging issue. Despite the potential benefits and challenges, research on purchasing in construction companies remains scarce. The aim of this thesis is two-fold: (1) to explore purchasing processes and practices in large Swedish construction companies regarding organisation of purchasing and buyer-supplier relationships, and (2) to suggest ways of improving purchasing.

This thesis is based on two studies. The first is a two-year case study in a large construction company where participant observations and interviews provided an understanding of purchasing mainly from the perspective of a central purchasing department. The second study is an interview study carried out in three large construction companies and among their subcontractors. The latter study provided important insights into the projects' perspective on purchasing.

This thesis shows conflicting interests between the purchasing department and the projects concerning relationships with suppliers with framework agreements. While purchasing departments have a long-term focus, projects focus on flexibility and smoothness in project delivery. These conflicting interests result in a dual interface towards suppliers. To bridge this tension, increased internal integration is proposed by forming cross-functional teams. The thesis also shows current practices for achieving cooperation in the relationships between contractor site managers and subcontractor foremen. This identified cooperation nuances the current one-sided perception of the construction industry as adversarial and short-term. Moreover, this thesis proposes a new definition of purchasing in construction, highlighting the importance of integrating strategic and operational perspectives when exploring purchasing processes and practices.

**Keywords:** Buyer-supplier relationships, Construction industry, Contractors, Cooperation, Integration, Organisation of purchasing, Subcontractors, Suppliers



# Appended papers

This thesis is based on the following papers:

## **Paper I**

Frödell, M. and Josephson, P.-E. (2008) Initiating Supplier Development through Value Stream Analysis: The Case of Skanska Sweden and its Largest Supplier. *Proceedings of CIB W65/55 Commissions: Transformation through Construction*. Dubai, UAE.

## **Paper II**

Frödell, M. (2011) Criteria for achieving efficient contractor-supplier relations. *Engineering, Construction and Architectural Management*, 18 (4), 381-393.

## **Paper III**

Frödell, M., Josephson, P.-E. and Koch, C. (2013) Integration barriers for purchasing organisation in a large construction company: towards requisite disintegration. *The IMP journal*, 7 (1), 46-58.

## **Paper IV**

Frödell, M. and Josephson, P.-E. (2012) Reproduction of exchange relationships: Changing focus from organisations to individuals. *Proceedings of CIB conference Management of Construction: Research to Practice*. Montreal, Canada.

## **Paper V**

Frödell, M., Stenberg, A.-C. and Josephson, P.-E. (2014) Integration and cooperation during subcontractor procurement in construction projects. *Working paper*.



# Distribution of work

Four of the five appended papers in this thesis have been written in collaboration with additional authors. This section clarifies the distribution of work among the authors:

## **Paper I**

Frödell wrote the paper and conducted the data collection. The study was designed in collaboration between Frödell and Josephson. The analysis was done in collaboration, where ideas, data and conclusions were discussed. Frödell presented the paper at the conference.

## **Paper II**

Frödell is sole author.

## **Paper III**

Frödell wrote most of the paper. The study was designed in collaboration between Frödell and Josephson. Frödell conducted the data collection. The analysis and theoretical framing was done in collaboration between Frödell, Josephson and Koch, where ideas, data and conclusions were discussed.

## **Paper IV**

Frödell wrote the paper. The study was designed primarily by Frödell. Data was collected primarily by Frödell. The analysis was done in collaboration between Frödell and Josephson, where ideas, data and conclusions were discussed. Frödell presented the paper at the conference.

## **Paper V**

Frödell wrote most of the paper. The study was designed primarily by Frödell. Data was collected primarily by Frödell and was supported by Stenberg. The analysis was done in collaboration between Frödell, Josephson and Stenberg where ideas, data and conclusions were discussed. This paper is a working paper.





# Additional publications

## Journal publication

Frödell, M., Josephson, P.-E. and Lindahl, G. (2008) Swedish construction clients' views on project success and measuring performance. *Journal of Engineering, Design and Technology*, 6 (1), 21-32.

## Conference papers

Koch, C., Frödell, M., Josephson, P.-E. and Kähkönen, K. (2010) Beyond the Design Fix - New Industrialisation in Contractor's Supplier Relationships. *CIB World Congress 2010*. Salford, UK.

Josephson, P.-E., Polesie, P. and Frödell, M. (2009) Understanding resources waste reduction priorities in Swedish construction. *Proceedings of CIB Joint International Symposium 2009: Construction Facing Worldwide Challenges*. Dubrovnik, Croatia.

Polesie, P., Frödell, M. and Josephson, P.-E. (2009) Implementing standardisation in medium-sized construction firms: facilitating site managers feeling of freedom through bottom-up approach. *Proceedings for the 17th Annual Conference of the International Group for Lean Construction*. Taiwan.

Josephson, P.-E., Frödell, M., Karlsson, A. and Lindström, J. (2006) Measuring performance within Swedish construction project organizations: learnings from other tools. *Proceedings of CRIOCM 2006 International Research Symposium on Advancement of Construction Management and Real Estate*. Beijing, China.

Josephson, P.-E., Lindström, J. and Frödell, M. (2006) Challenges when developing tools for measuring construction excellence: a Swedish case. *Construction in the XXI Century: Local and global challenges, Symposium Proceedings*. Rome, Italy.

Alsnäs, C., Frödell, M., Jaworski, M., Johansson, M. and Schatter, F. (2004) Leadership for Successful Design: Actions of Project Leaders to Achieve High Quality Design. *Proceedings of the International Business & Management Research Conference*. Honolulu, HI, USA.

Frödell, M., Gustafsson, R., Hjelte, P., Landgren, J. and Pettersson, J. (2004) Making an Organisation More Customer Adapted: Suggestions for a Medium-Sized Construction Company Based on their Customers' Opinions. *Proceedings of the 1st International Conference World of Construction Project Management*. Toronto, Canada.

## **Reports**

Josephson, P.-E., Eriksson, T. and Frödell, M. (2011). *Vad kostar materialet, egentligen? - Exempel för armeringsprodukter*, Bygg- och miljöteknik, Chalmers tekniska högskola, Göteborg.

Frödell, M. (2009). *Contractor-Supplier Relations in a Large Contractor Organisation*. Licentiate thesis, Chalmers University of Technology, Gothenburg.

# Acknowledgement

Well, this is the final section of my thesis that I am writing. I must say that it is with mixed feelings. We have had several years together my thesis and I, some more enjoyable than others. During this PhD project, I have learnt much and gained many new experiences. For this I would like to show my gratitude.

I would like to thank Professor Per-Erik Josephson, my supervisor, for being an inspiration, for your enthusiasm, and for all constructive discussions. Thanks to Dr Lotta Stenberg, my co-supervisor, for your constructive comments. Thanks also to Professor Christine Räisänen for your commitment and support. Also, to all my current and former colleagues at Construction Management, thank you for both “at work” and “after work” activities and discussions.

Also, Andrea Pap de Pesteny, manager for the supplier development project at Skanska Sweden, and all my former colleagues at Skanska Sweden, thank you for a good time, interesting discussions and for being objects of my observations.

I would also like to say thank you to all my respondents for sharing your knowledge and perspectives. Also, many thanks to The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas 208-56), The Development Fund of the Swedish Construction Industry (SBUF 12073) and The Centre for Management of the Built Environment (CMB) for funding my research. This PhD project has been part of Chalmers Production Area of Advance.

Finally, I would like to thank my family and friends for support and encouragement, and Madelene, my wife-to-be, for being you.

Göteborg, June 2014

Mikael Frödell



# Table of Contents

<b>1</b>	<b>Introduction.....</b>	<b>1</b>
1.1	Purchasing in construction companies .....	1
1.2	Challenges for purchasing in construction companies.....	4
1.3	Aim and research questions .....	6
1.4	Structure of the thesis.....	8
<b>2</b>	<b>Theoretical perspectives on purchasing.....</b>	<b>9</b>
2.1	Defining purchasing in construction .....	9
2.2	Organisation of purchasing .....	12
2.3	Buyer-supplier relationships .....	14
2.4	Suggested practices for improved purchasing.....	18
<b>3</b>	<b>Method .....</b>	<b>21</b>
3.1	Research approach and process.....	21
3.2	Study 1 – Purchasing in a large construction company .....	22
3.3	Study 2 – Project perspectives and subcontractors .....	28
3.4	Reflections on the method.....	32
<b>4</b>	<b>Summary of the papers.....</b>	<b>35</b>
4.1	Paper I – Initiating supplier development through value stream analysis: The case of Skanska Sweden and its largest supplier ....	35
4.2	Paper II – Criteria for achieving efficient contractor-supplier relations.....	36
4.3	Paper III – Integration barriers for purchasing organisation in a large construction company: towards requisite disintegration.....	37
4.4	Paper IV – Reproduction of exchange relationships: Changing focus from organisations to individuals .....	38
4.5	Paper V – Integration and cooperation during subcontractor procurement in construction projects.....	39
<b>5</b>	<b>Discussion and conclusions.....</b>	<b>41</b>
5.1	Organisation of purchasing .....	41
5.2	Criteria for “good” buyer-supplier relationships.....	45
5.3	Site managers’ and subcontractor foremen’s influence on purchasing .....	48
<b>6</b>	<b>Implications for construction and research.....</b>	<b>53</b>
6.1	Implications for large construction companies .....	53
6.2	Implications for further research.....	55
	<b>References .....</b>	<b>57</b>



# 1 Introduction

## 1.1 *Purchasing in construction companies*

In general, companies are encountering increased competition due to globalisation and increased customer demands. To remain competitive, it is important that both total costs and resource utilisation are reduced. The construction industry, including construction companies<sup>1</sup>, has been criticised for low productivity and inefficient processes in for instance the UK (e.g. Egan, 1998), and Sweden (e.g. Bygghandelskommissionen, 2002; Statskontoret, 2009). Josephson and Saukkoriipi (2007) argue that theoretically costs for construction projects can be significantly reduced, but challenges encountered in practice make this complicated.

One of the processes which has been identified as needing improvement is the purchasing process (Dainty et al., 2001; Gadde and Dubois, 2012; Proverbs and Holt, 2000). It has been argued that purchasing can be a powerful means of gaining competitive advantage and increasing a company's overall profitability. This is not only due to suppliers' impact on the buying company's total costs, but also on the quality of the final product (Monczka et al., 2009; van Weele, 2005). Yet, in the construction management literature it remains an under-researched field.

This thesis explores purchasing processes and practices in large Swedish construction companies by examining the organisation of the purchasing function and buyer-supplier relationships. Based on the findings, the study also aims to suggest ways of improving purchasing. In this thesis, purchasing is seen as having a strategic role in shaping a construction company's competitiveness. Purchasing includes the management of the company's external resources, and is not limited to ordering and expediting<sup>2</sup>. In focus is the Swedish construction industry, and specifically construction companies with more than 250 employees or a turnover of over €50M (The Commission of the European Communities, 2003)<sup>3</sup>. For these companies, the purchase of materials and services is 70 to 80 per cent of the

---

<sup>1</sup> The terms construction company and contractor are used interchangeably in this thesis.

<sup>2</sup> The definition of purchasing is further elaborated in Section 2.1.

<sup>3</sup> According to the EU definition (2003/361/EC) of SMEs (Small and Medium-sized enterprises), a SME has less than 250 employees and a turnover of less than €50M or a balance sheet total of less than €43M. Companies above any of these limits are categorised as large, and large companies are focused on in this thesis. Approximately 50 large construction companies are active in Sweden, and they represent about 50% of the market.

turnover (e.g. Axelsson, 2005, Paper III). Hence, the implementation and execution of purchasing are critical for the profitability and competitive edge of such construction companies.

The importance of purchasing is made clear in, for instance, the three largest Swedish construction companies' annual reports, where purchasing is highlighted as part of their core strategies:

*“Cost reductions are a prerequisite for organic growth. The main focus within the construction business will be [...] further enhancement of the company’s purchasing activities”* (NCC, 2013).

*“To take advantage of the cost reduction achieved from coordination of the Group’s [Skanska globally] purchasing”* (Skanska, 2012)

*“Cost efficiency is essential to developing a competitive business. [This is achieved by] coordinated purchasing”* (Peab, 2012)

One externally oriented activity identified in the construction companies' strategic documents is lowering the costs of purchased materials and services. According to their annual reports, they aim to achieve this by consolidating volumes, renegotiating agreements as well as through international purchasing (NCC, 2013; Peab, 2012). Hence, through economies of scale achieved by coordinating and consolidating the purchase of materials and services and through the increased competition brought about by reaching out to more suppliers, both nationally and internationally, the contractors try to induce the suppliers to lower their prices.

Another externally oriented activity mentioned in the strategy documents is developing relationships with selected suppliers and consequently increasing efficiency in the mutual processes and thereby decreasing the suppliers' costs (NCC, 2013; Peab, 2012). By selecting suppliers with whom to sign long-term agreements ranging over a series of projects and by e.g. implementing e-procurement portals, the contractors seek to facilitate ordering and to increase the standardisation of the suppliers' available product ranges (NCC, 2013; Peab, 2012). Another aim is to mutually develop the selected suppliers' efficiency.

An internally focused activity which has been formulated in the strategy documents is coordinating purchasing within the contractor organisations (NCC, 2013; Peab, 2012; Skanska, 2012). This can be achieved by intensifying agreement compliance concerning long-term agreements (Peab, 2012). This indicates that construction companies experience challenges in implementing



purchasing and in coordinating processes and practices between purchasing department and projects.

The construction companies seem to have two strategic approaches concerning purchasing. Firstly, there is the external approach where the contractors aim to work with their suppliers in order to decrease costs. Secondly, there is the internal approach where the organisation of the purchasing function influences the relationships with suppliers. Even though the two approaches are formulated in the construction companies' strategies, their practice still needs further exploration. In this thesis, these two approaches concerning purchasing are scrutinized.

The benefits of purchasing have been studied by several authors. A recent cross-industry survey identified increased profitability, increased financial performance, decreased costs and increased quality as potential benefits of purchasing (Hartmann et al., 2012). Purchasing in terms of focus, involvement, visibility and status has been shown to facilitate supplier integration, i.e. relational, process, information and cross-organisational team integration (Paulraj et al., 2006). Furthermore, supplier development through feedback to suppliers, site visits and formal evaluations of supplier performance has been shown to have positive effects on the quality and cost of the purchased materials and services (Krause, 1997; Sánchez-Rodríguez et al., 2005), as well as on the buying company's financial performance (Carr and Pearson, 1999). Some critical voices have questioned the consistency of the studies that show a positive correlation between purchasing and company performance (e.g. Fabbe-Costes and Jahre, 2007; Van Der Vaart and Van Donk, 2008). Hartmann et al. (2012) identify drivers that benefit purchasing as: supplier management, cross-functional integration, strategy development, human relationship management and purchasing controlling. Both the internal drivers, e.g. cross-functional integration and strategy development, and the external drivers, e.g. supplier management, are addressed by Hartmann et al. (2012) who conclude that both the internal and external approach formulated in construction companies' strategies are important in order to achieve a successful implementation of purchasing.

Within the construction management literature, focus during recent decades has been on the supply chain and on purchasing. In purchasing, the attention has been on how to achieve integration, especially in the relationships between client and contractor (Pryke, 2009). Other relationships, such as those between contractors and their suppliers have, however, been neglected (Akintoye et al., 2000; Bemelmans et al., 2012; Saad et al., 2002). Some studies during the last few years have addressed relationships between contractor and supplier by, e.g.,

investigating how a contractor's central initiative to create a supply network with subcontractors influences the supply base over time (Holmen et al., 2007), how contractors have successfully adopted cooperative integration of suppliers in industrialised building (Nordin et al., 2010), and how the contractors' supplier selection can be influenced by the interplay between supplier flexibility, i.e. flexibility in specific suppliers' manufacturing and logistics operations, and sourcing flexibility, i.e. the ability to reconfigure a supply chain through selection and de-selection of suppliers (Gosling et al., 2010). Reaching a better understanding of the relationship between contractor and supplier is, however, warranted both from a theoretical perspective as well as from a practice perspective (Dainty et al., 2001; Eom et al., 2008; Hartmann and Caerteling, 2010; Hatmoko and Scott, 2010; Proverbs and Holt, 2000). Nonetheless, several challenges make purchasing in construction companies complicated.

## ***1.2 Challenges for purchasing in construction companies***

### **1.2.1 Challenges with internal integration**

The focus on individual projects within the construction companies implies difficulties in implementing the strategies of purchasing (Bygballe et al., 2013). Internally in construction companies, challenges arise regarding the interplay between the permanent organisation and the projects, as well as learning and dissemination of project practices across project boundaries (Gann and Salter, 2000; Sydow et al., 2004; Thiry and Deguire, 2007). Members of the permanent organisation and project participants have been shown to have different goals and ambitions thus creating a mismatch between the permanent and the temporary organisations (Gluch and Räisänen, 2012; Samuelsson, 2006). These loose couplings within the companies stem from the decentralisation of authority, where "centrally located authority has limited possibilities to intervene in local operations" (Dubois and Gadde, 2002:628). Such local decision-making, i.e. in projects, influences purchasing within construction companies as a whole by creating tensions between projects and the purchasing department regarding where decisions should be taken and where activities should be carried out.

The organisation of the purchasing function is important when construction companies have the ambition to improve integration between the projects and the purchasing department (Hillebrand and Biemans, 2003; Rozemeijer and Wynstra, 2005). In this perspective, integration is used in terms of "the process of incorporating or bridging different groups, functions or organisations [...] to work jointly [...] on a common business-related assignment or purpose" (Monczka et al., 2009:114). Since the organisational structure of construction

companies is often such that purchasing is conducted both centrally within the purchasing department as well as locally within the projects (e.g. Axelsson, 2005; Ellegaard and Koch, 2014; Paper III), see Figure 1, coordination and integration are essential factors. Should purchasing be centralised, problems with internal integration, in terms of integration between the purchasing department and projects, will occur in the construction companies (Ellegaard and Koch, 2012). Should purchasing be decentralised, duplication of purchasing efforts will occur throughout the company since similar processes have to be carried out in each project (Karjalainen, 2009). Furthermore, internal integration influences relationships with suppliers (Zhao et al., 2011). A challenge for the construction companies is how to structure the organisation of the purchasing function.

### **1.2.2 Many types of suppliers involved**

Due to the supplier market, construction companies also face several challenges concerning purchasing. Suppliers are divided into material suppliers and service suppliers. Material suppliers provide the buying organisation with purchased goods, e.g. plasterboards, concrete or windows.

Service suppliers provide a service, e.g. painting, landscaping or installation of heating and ventilation<sup>4</sup>. In accordance with practice within the construction industry and in construction research (e.g. Arditi and Chotibhongs, 2005; Eccles, 1981; Hartmann and Caerteling, 2010), the categories of service suppliers which are in focus in this thesis are referred to as subcontractors. The terms subcontractor and specialist contractor are used interchangeably. Large parts of construction projects are executed by specialist contractors (Benton and McHenry, 2010). Due to their specialised skills, specialist contractors are subcontracted to perform specific tasks in the projects (Arditi and Chotibhongs, 2005), or in order for the construction company to mitigate potential project risks (Eriksson et al., 2007).

Based on the Swedish standard industrial classification (SNI, 2007), specialist contractors are divided into four categories: (1) demolition and site preparation; (2) electrical, plumbing, heat and air-conditioning and other construction installation activities; (3) building completion and finishing including plastering, joinery installation, flooring, wall covering and painting; and (4) other specialists including e.g. roofing (Statistics Sweden, 2013). Different types of specialist contractors, Eccles (1981) argues, need to be handled in different ways during purchasing due to their specific characteristics, e.g. type of work and

---

<sup>4</sup> There are other categories of service suppliers that are not included in this thesis, e.g. recruitment, management and technical consultants.

interdependencies, as well as during the periods they are active in the projects. The many interdependencies in construction projects also require frequent and direct interaction between the actors, which puts pressure on planning and the coordination of the actors, as well as on the interplay between them (Bankvall et al., 2010). Taking these interactions and experiences between the different trades during procurement of specialist contractors into consideration is a challenge for the construction companies.

### **1.2.3 Long-term vs. short-term supplier relationships**

Additionally, suppliers can be contracted either for a single project or a series of projects. The latter type of suppliers are labelled suppliers with framework agreements; they have firm-based agreements with the construction company. The agreements are signed by the central purchasing departments and have specified durations, e.g. one year or three years, and concern more than one project. Suppliers with project agreements are contracted separately for each project, and the agreement is signed by the project and is valid for only that specific project (Winch, 2010).

Submitting suppliers to competition during the purchasing for each project has traditionally been considered the most effective way to obtain the lowest price (Cox and Thompson, 1997). The supplier market in construction is exposed to competition and is based on short-term and market-based transactions (Gann, 1996; Thompson et al., 1998). This has been identified as the most fundamental characteristic of the industry (Dubois and Gadde, 2000; Pryke, 2009). Selection of subcontractors based on lowest price for each project is still portrayed as the standard procedure in subcontractor procurement (Hartmann and Caerteling, 2010; Laryea and Lubbock, 2014). While short-term agreements have the advantage of flexibility to changing market conditions, long-term agreements could be advantageous for mutual development of more efficient processes (Monczka et al., 2009; Winch, 2010). There does not, however, seem to be any common approach towards suppliers in terms of long-term or short-term supplier relationships; rather each buyer-supplier relationship needs to be handled according to its specific characteristics and its specific context (Gadde and Snehota, 2000; Harland, 1996a). A challenge for construction companies is how to best deal with suppliers: using either short-term project agreements or long-term framework agreements.

## **1.3 Aim and research questions**

The aim of this thesis is two-fold: (1) to explore purchasing processes and practices in large Swedish construction companies regarding organisation of

purchasing and buyer-supplier relationships, and (2) to suggest ways of improving purchasing.

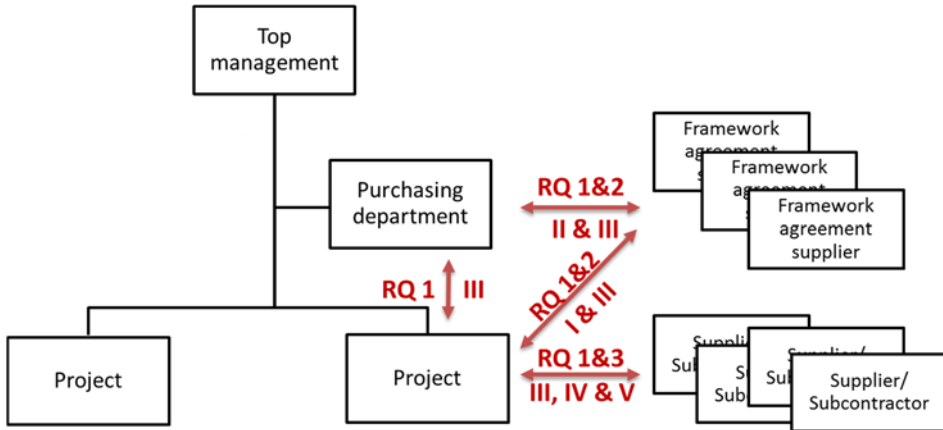
As part of fulfilling the aim, three research questions, each of which investigates specific issues within the scope of the thesis, have been formulated:

*RQ 1) How does organisation of the purchasing function influence relationships with suppliers?*

*RQ 2) What criteria do construction companies use to achieve “good” relationships with suppliers with framework agreements?*

*RQ 3) What influence do site managers and/or subcontractor foremen have on the selection of subcontractors?*

The research questions address different perspectives of purchasing in large construction companies as well as their relationships with suppliers. As illustrated in Figure 1, research question one addresses the internal interactions between purchasing department and the projects as well as the organisation of the purchasing functions’ influence on external relationships with suppliers. The focus is mainly on suppliers that have a framework agreement with the construction company. In addition, some suppliers without framework agreements are included in the study. Research question one is investigated in Paper III. Research questions two and three address external relationships between construction companies and their suppliers. Research question two is dealt with in Papers I and II and research question three in Papers IV and V. The scope of this thesis is limited to Swedish construction companies operating in the Swedish market.



**Figure 1. A construction company, its suppliers and the focus of the research questions and appended papers I-V. Purchasing is conducted both within the purchasing department and within the projects.**

### **1.4 Structure of the thesis**

This thesis consists of six chapters and five appended papers. The first chapter, Introduction, has presented the research background and positioned the research. The second chapter presents the theoretical framework, focusing on the organisation of the purchasing function, buyer-supplier relationships, and suggested practices for improved purchasing in construction companies. Chapter three describes the methods used to collect and analyse the data of the two studies conducted. Chapter four provides a brief summary of each of the five appended papers. In chapter five the results of the research are discussed, the research questions answered, and conclusions are presented. Finally, in chapter six implications for large construction companies and research are presented.

## **2 Theoretical perspectives on purchasing**

### ***2.1 Defining purchasing in construction***

As mentioned in the introduction, purchasing has strategic importance for the competitive position of large construction companies. In the purchasing literature, the strategic perspective is presented as one of two perspectives, the other being an operational perspective on purchasing. Drawing on the purchasing literature in general and the challenges facing construction companies (mentioned in the introduction) I review some of the most relevant literature on purchasing, and propose a tentative definition of purchasing for construction.

Based on their study of manufacturing companies, Paulraj et al. (2006) argued that a strategic perspective on purchasing is characterised by: (1) a strategic focus of purchasing in terms of whether the purchasing function has a formal long-range plan; (2) strategic involvement of the purchasing function in terms of whether purchasing is included in the company's strategic planning process and whether it is based on knowledge of the company's strategic goals; and (3) the status and visibility of the purchasing professionals in terms of whether top management considers purchasing to be a vital part of the company's strategy, and if the chief purchasing officer has high visibility within top management. Other factors which characterise a strategic perspective on purchasing, based on cross-industry surveys in the US, are buyers' interaction with and influence over suppliers, a purchasing department's interaction with other departments, and the purchasing organisation and structure (Carter and Narasimhan, 1996), as well as purchasing knowledge and skills, purchasing risk taking and purchasing resources (Carr and Smeltzer, 1997). A strategic perspective on purchasing is important in order to understand how organisations gain and keep competitive advantage (Kraljic, 1983; Monczka et al., 2009), and "should be viewed as a key component of firm competitiveness" (Carter and Narasimhan, 1996:24).

In the construction companies mentioned in the introduction, the strategic perspective on purchasing is reflected in the improvement and development of purchasing processes and practices as articulated in the strategic documents. These improvements have become prerequisites for the companies' organic growth. An example of the status of the purchasing function is the effort in one of the large construction companies to increase the status and visibility of the purchasing function within the company by making the purchasing director a part of the top management team (Paper III).

However, the large construction companies' organisational structures are often such, that in addition to purchasing being conducted in the purchasing department, it is also carried out in the projects (Axelsson, 2005; Ellegaard and Koch, 2012), and this needs to be considered in order to understand purchasing processes and practices in these companies. Viewing purchasing from solely an operational perspective to "obtain the proper equipment, material, supplies and services of the right quality, in the right quantity, at the right price and from the right source" (Aljian, 1984:3, in van Weele, 2005) has been argued to be an overly limited perspective of purchasing when the potential impact of purchasing on profitability is examined (Pooler et al., 2004). Therefore, though the operational perspective cannot be neglected, a strategic perspective on purchasing in construction is needed when large construction companies are under study.

Even though many studies have identified factors characterising a strategic perspective on purchasing, few have formulated a definition of purchasing within the purchasing literature. Monczka et al. (2009) and van Weele (2005) are two exceptions. While Monczka et al. (2009) formulated a definition based on a set on essential factors, including the management of the supply base and the use of cross-functional groups, van Weele (2005) has formulated a definition of purchasing which does not delimit the scope of purchasing to a certain set of factors. Instead, he defines purchasing as an integral part of the company's primary activities (see also Porter, 1985) and includes a broad view of purchasing:

*"Purchasing is the management of the company's external resources in such a way that the supply of all goods, services, capabilities and knowledge which are necessary for running, maintaining and managing the company's primary and support activities is secured at the most favourable conditions"* (van Weele, 2005:12).

A definition of purchasing in construction must encompass the three challenges that were formulated in the introduction: internal integration, many types of suppliers, and long-term vs. short-term buyer-supplier relationships. Regarding the many types of involved suppliers, the definition by van Weele covers many different types of supplies, e.g. goods, services, capabilities and knowledge, which are necessary for the buying company's activities. The challenge which construction companies are facing concerning the many different types of suppliers involved in the construction projects (Arditi and Chotibhongs, 2005; Benton and McHenry, 2010) and where the different types of suppliers need to be considered due to their specific circumstances (Bankvall et al., 2010; Eccles, 1981) is covered in the definition by van Weele.



Additionally, regarding the challenge of long-term versus short-term buyer-supplier relationships, van Weele's definition covers not only the specific materials or services delivered, but also knowledge within the supplier organisations. This relates to knowledge regarding material specifications, ways of working efficiently when installing material at the construction site, and ways of creating a "good" relationship between suppliers and contractors. This aspect is an important factor in the strategic perspective on purchasing in terms of buyers' interaction with and influence over suppliers (Carter and Narasimhan, 1996). The challenges to construction companies regarding the long-term vs. short-term buyer-supplier relationships (Hartmann and Caerteling, 2010; Winch, 2010) is also in the scope of the van Weele definition.

Van Weele's definition does not, however, take into consideration the construction companies' challenge regarding the internal integration of projects and the purchasing department. As mentioned in the introduction, the tension and the difference in the logic of the projects and the logic of the purchasing department is a challenge for construction companies (Ellegaard and Koch, 2014; Gadde and Dubois, 2010). Integration is highlighted as an important factor of the strategic perspective on purchasing in terms of interaction with other departments (Carter and Narasimhan, 1996), the strategic involvement of the purchasing function (Paulraj et al., 2006), and the status and visibility of the purchasing professionals and the purchasing department (Carr and Smeltzer, 1997; Paulraj et al., 2006). In order for van Weele's definition to cover circumstances in construction, it is important to add the internal integration between projects and the purchasing department.

Consequently, in order to cover the important factors of a strategic perspective on purchasing in large construction companies, I propose a tentative definition of purchasing in construction:

*Purchasing is the management of a construction company's external resources in terms of goods, services, capabilities and knowledge, based on both long-term and short-term perspectives, in order to enable the running, maintaining and managing of the construction company's projects and support activities while integrating the project perspective and the company perspective.*

With this perspective on purchasing, the organisation of the purchasing function and the construction companies' relationships with suppliers is further investigated in order to explore purchasing processes and practices in large construction companies. Lastly, suggested practices for improved purchasing in the construction-oriented purchasing literature are reviewed.

## **2.2 Organisation of purchasing**

As mentioned in the introduction, the organisation of the purchasing function is important when confronted with challenges concerning the internal integration of the purchasing department and the projects. The organisation of the purchasing function determines where in the construction company the purchasing activities are effectuated and how buyer-supplier relationships are managed.

Purchasing activities can be divided according to their scope, and have been categorised as either strategic or operational activities (e.g. Monczka et al., 2009). Strategic activities are long-term and cover those purchasing activities that directly influence the competitive position of the company on both customer and supply markets. These include activities such as managing relationships with suppliers with framework agreements, developing electronic purchasing systems and implementing companywide best practices. By separating the strategic activities from other activities, e.g. operational activities, they receive more attention from the organisation even though they may lack the urgency of some of the other activities (Monczka et al., 2009). Operational activities are most commonly executed by the operational core of the organisation and encompass activities such as using electronic purchasing systems to obtain standard goods, sourcing goods that are unique to the operating unit, and generating materials releases (call-offs) on existing agreements (Monczka et al., 2009). Hence, the operational activities include the ordering and expediting functions. In addition to the strategic and operational activities, tactical purchasing activities which concern the involvement of purchasing in product, process and supplier selection as well as in contracting have also been mentioned in the literature (e.g. van Weele, 2005). Tactical activities further include developing and conducting value analysis, certification programs to improve quality of incoming materials and supply base reduction programs. Tactical activities are cross-functional in nature (van Weele, 2005), and are essential to take into account in this thesis when discussing coordination and integration between the organisations' different functions and the organisation of purchasing.

Regarding the organisation of purchasing, it is mainly three organisational modes that are described in the purchasing literature (e.g. Fearon and Leenders, 1995; Koch, 2011; Rozemeijer and Wynstra, 2005): centralised, decentralised and hybrid. In the centralised mode, the purchasing department is located centrally in the organisational structure of the company. Purchasing activities such as supplier strategies, selection of suppliers, negotiation and signing of long-term agreements are the responsibility of the purchasing department (van Weele, 2005). Operational activities such as call-offs on agreements are conducted locally, and

in construction companies this means in the projects, in accordance with the agreements signed by the purchasing department. The purchasing tasks and decisions are thus located in the purchasing department. In the decentralised mode, the authority over purchasing activities and decisions is located locally, and business units or projects are fully responsible for all purchasing activities (van Weele, 2005). All purchasing decisions and tasks are executed locally, and a central purchasing department is therefore not required.

Both centralised and decentralised organisational modes have advantages. By centralising the purchasing authority, purchasing volumes may be consolidated, adherence to purchasing plans and strategies is facilitated, and purchasing expertise is developed within the purchasing department (van Weele, 2005). Additionally, the duplication of purchasing efforts within the company may be reduced (Monczka et al., 2009). A decentralised organisation of purchasing on the other hand may result in functions within the same company negotiating with the same supplier regarding similar products, but this may be compensated by the potential benefits resulting from local embeddedness and an enhanced understanding of the operational requirements. In addition to increased individual ownership and personal commitment through this empowerment, a decentralised purchasing organisation may also gain advantages regarding speed and responsiveness to changing demands and market conditions (Monczka et al., 2009).

Few companies are, however, at either of these extremes (Monczka et al., 2009). A widespread practical solution for organisation of the purchasing function in companies are hybrid modes, i.e. various combinations of centralised and decentralised modes (Fearon and Leenders, 1995). Rozemeijer and Wynstra (2005) propose a model inspired by Rozemeijer (2000) for choosing a preferred purchasing organisation based on corporate coherence and purchasing maturity. Corporate coherence relates to the extent to which different parts – projects in this thesis – of the company are operated and managed as one entity. Purchasing maturity relates to the professionalism in the purchasing function regarding e.g. its role and position, the involvement of top management in strategic purchasing decisions, the quality of the purchasing staff and the level of collaboration with suppliers. Based on corporate coherence and purchasing maturity, a five mode taxonomy has been presented by Rozemeijer and Wynstra (2005): Decentralised, when maturity and coherence are low; Federal, when maturity is high and coherence is low; Centre-led, when maturity and coherence are high; Centralised, when maturity is low and coherence is high; and Coordinated, as an intermediate

mode when both maturity and coherence are intermediate. Federal, Centre-led and Coordinated are hybrid modes.

Despite many previous studies of the organisational structure of the purchasing function, further studies have been called for to “support purchasing’s growing importance and enlarged set of responsibilities” (Schneider and Wallenburg, 2013:152). An underpinning assumption in the previous studies is that organisations are designed as matrix or functional organisations (e.g. Bocconcelli and Håkansson, 2008; Rozemeijer, 2000). With few exceptions (e.g. Dubois and Wynstra, 2005; Ellegaard and Koch, 2012), organisation of purchasing in construction companies has not been researched. Since the original models of organisation of purchasing do not take into consideration the construction company context, the models need to be revised in order to explain the situation at hand. Inquiry into the organisation of purchasing in construction companies is thus warranted. If there is no clarity regarding the organisation of purchasing within a company, conflicts between different functions may develop (Ellegaard and Koch, 2014). In this thesis, views on the organisation of the purchasing function are used to analyse how organisation of purchasing influences buyer-supplier relationships. In the purchasing literature this interplay between the organisation of purchasing and the relationships with suppliers has been pointed out as important (Gadde et al., 2010; Hessel, 2014; Hillebrand and Biemans, 2003; Zhao et al., 2011).

### **2.3 Buyer-supplier relationships**

Construction companies face challenges related to the many types of suppliers involved as well as to the choice between long-term and short-term supplier arrangements. These challenges relate to the shared processes of the construction companies and their suppliers.

The labelling of these shared processes between buyer and supplier seems difficult. Several terms are used within the literature such as “transaction” (e.g. Williamson, 1981; Winch, 2001), “interaction” (e.g. Håkansson, 1982) and “relationship” (e.g. Harland, 1996b). I am aware that the notion of “relationship” might imply that there is something more to the processes between buyer and supplier in terms of long-term orientation, trust or collaboration, but nevertheless, I use the term “relationship” in this thesis since it is commonly used in the construction literature when these processes are under discussion (e.g. Dainty et al., 2001; Fernie and Thorpe, 2007; Hartmann and Caerteling, 2010).

Within the purchasing literature the types of buyer-supplier relationships range from arm’s length transactional relationships where two parties engage in a

transaction isolated in time, to collaborative relationships which span over extended periods reaching beyond the specific transaction, i.e. for more than one project (Anderson and Narus, 1991; Sako, 1992). Hence, the type of relationship, in this thesis referred to as the working closeness, depends on the expected duration of the relationship and how closely the involved parties need to work in order to achieve their goals. In the construction literature, collaborative relationships have been referred to as, for instance, long-term collaborative relationships (Fernie and Thorpe, 2007), high-involvement relationships (Gadde and Dubois, 2010) or partnering/partnerships (Beach et al., 2005; Dainty et al., 2001; Gadde and Dubois, 2010; Hartmann and Caerteling, 2010).

Buyer-supplier relationship studies are split into two streams, where the first focuses mainly on long-term relationships and the criteria for achieving such relationships, and the second is concerned with elucidating the importance of context and circumstances when choosing a preferred type of buyer-supplier relationship. Both these streams are covered below.

### **2.3.1 Criteria and barriers for long-term buyer-supplier relationships**

In the studies of buyer-supplier relationships that focus on long-term relationships, several criteria such as trust, commitment, effective communication, top management commitment and expectation of relationship continuity have been identified as essential for building long-term relationships (e.g. Ellram, 1995; Krause, 1999; Monczka et al., 1998). Based on a survey of 141 buyer-supplier practitioners within manufacturing, transport, distribution, food and pharmaceuticals in South Korea, Ryu et al. (2009) argued for a division of these criteria into two levels, where at the first level strategic fit and interdependency influence commitment between buyer and supplier, and at the second level operational compatibility and communication influence trust. Ryu et al. (2009) claimed that both commitment and trust influence the collaboration between the parties, which in turn contributes to better performance in the buyer-supplier relationship.

In construction as well, trust has been shown to be an important factor in collaborative relationships (e.g. Laan et al., 2011). Based on studies of relationships between construction clients and contractors, Kadefors (2004) argued that since construction projects often stretch over long periods, trust in buyer-supplier relationships may develop even during a single project. Furthermore, Lau and Rowlinson (2009) make a distinction between inter-firm trust and inter-personal trust and, basing their argument on a questionnaire survey in construction projects, they contended that construction clients tend to trust the

individual (in the construction company) in the buyer-supplier relationship, whereas in buyer-supplier relationships between construction companies and subcontractors, construction companies trust the firm. However, based on a questionnaire survey of individuals within the construction industry, Doloi (2009) showed that effective communication is even more important than trust. Hence, even though trust has been spotlighted as important, its influence as a criterion for long-term buyer-supplier relationships between construction companies still needs investigating.

Furthermore, based on a questionnaire survey of 448 contractor-subcontractor relationships in the Dutch construction industry, Kamann et al. (2006) investigated how previous mutual experiences and expected future interaction between contractors and subcontractors influence efficiency and project outcomes. In contrast to Lau and Rowlinson (2009), these authors saw a stronger link when previous and expected future experiences were between the individuals rather than on organisational level. Moreover, Kamann et al. (2006) showed that better results in projects were only related to the individuals' expectations of a common future, and not to their only having a common past. These results also differ from Beach et al. (2005), who, based on a questionnaire survey of 34 construction companies all with long-term relationships with a specific supplier, pointed out that the majority of respondents in their study believed that subcontractors with previous experience of the contractor would provide the contractor with better services. Consequently, as there seems to be no consensus in the understanding of the influence of previous experience, this still remains an important issue to investigate. Since the results differ at both organisational and individual levels, this differentiation will be followed up in this thesis.

In the studies promoting long-term relationships between construction companies and their suppliers, several barriers to the establishment of these relationships are mentioned. One of the main barriers to establishing long-term relationships with subcontractors, which are often small or medium-sized companies, is that the subcontractors perceive long-term relationships as increasing the contractor's profitability at the expense of their own (Dainty et al., 2001). It is further argued that long-term relationships are constrained by the construction client, i.e. the contractor's buyer. Some researchers have argued that construction clients are more reluctant to long-term relationships than are subcontractors, and that construction clients insist that contractors should use tender-based procurement of subcontractors instead of relying on long-term relationships (Beach et al., 2005). The clients' reluctance to long-term relationships is then passed on to the contractors in their relationships with their subcontractors and suppliers (Briscoe

and Dainty, 2005). Furthermore, Humphreys et al. (2003) argued that construction companies, when establishing long-term relationships with subcontractors, need to consider the low entry barriers for subcontractors in the construction industry as these may lead to subcontractors that do not always have the required expertise to perform satisfactorily. These identified barriers indicate that local knowledge of the suppliers is needed in the construction companies, as well as reinforce the need to not neglect the operational perspective on purchasing.

### **2.3.2 Context-dependent buyer-supplier relationships**

In the second stream of studies of buyer-supplier relationships, the generally positive influence of trust, commitment and long-term collaborative relationships is criticised and argued to not guarantee satisfaction and mutual understanding among buyers and suppliers (e.g. Fernie and Thorpe, 2007; Harland, 1996a). Through a comparison of companies in the automotive aftermarket in Spain and the UK, Harland (1996a) showed that satisfaction with the relationship among the involved actors was the same in both the collaborative and in the arm's length relationships, and argued that the circumstances decide what kind of relationship is the most appropriate.

Accordingly, no general best type of buyer-supplier relationship seems to exist, but prerequisites, such as mutual previous experiences, as well as context, such as company size and volume of business, play major roles in relationship decisions (Gadde and Snehota, 2000). Due to the limited opportunities of collaborative relationships being successfully implemented by both construction companies and suppliers, critical voices have raised concerns regarding researchers advising practitioners to engage in these relationships. The reasons for the criticism are possible discrepancies in size and turnover between contractor and supplier, as well as the possibility of one party being dependent on the other party for their existence and the survival of their business (Cox and Ireland, 2002).

Green et al. (2005) stated that few of the papers within construction research include context in their studies, and pointed out that power relations between companies as well as market conditions influence the appropriate type of buyer-supplier relationship. Hence, the relationships and the way that the supplier is approached by the contractor should be adapted to the context of the specific situation (Fernie and Thorpe, 2007). Similarly, Blois (1998) argued that "the risk of viewing relationships as if they must involve commitment and an almost blanket trust is to ignore the rich diversity of relationships which not only exist but are appropriate in different contexts" (1998:278). In this thesis, I do not take

for granted that buyer-supplier relationships are long-term and collaborative but rather look at each individual relationship in its specific context.

Cox (2001) argued that buyer-supplier relationships are characterised by the actual level of conflict between the buyer and supplier, and referred to this as the level of adversarialism. Cox (2001) emphasized that the level of adversarialism is independent of whether the relationship is collaborative or arm's length, i.e. the working closeness. Hence, despite the working closeness of the relationship, the actual adversarialism in the relationship may be either high or low. This distinction between working closeness and adversarialism is also taken into consideration in the analysis of the data.

## ***2.4 Suggested practices for improved purchasing***

In studies of buyer-supplier relationships, suggestions have been formulated on how to achieve better performance in the mutual processes between construction companies and suppliers. The most prominent expectation from construction companies concerning subcontractors with which the construction company has previously worked on several projects was that they should commit more resources to projects and create dedicated and integrated inter-organisational teams (Beach et al., 2005). Based on their study in which a process for developing long-term relationships was developed and tested with two subcontractors, Errasti et al. (2007) advised construction companies that significant improvements may be possible if their purchasing was concentrated to fewer suppliers and that they work more closely with these suppliers.

Other successful examples of buyer-supplier relationships were based on inter-organisational teams in the construction projects that had developed effective systems for communication and information exchange in project delivery (Briscoe and Dainty, 2005). Also, in a case study of a construction company in the UK and its subcontractors where the construction company worked systematically towards its most critical subcontractors, both contractor and subcontractors saw lower costs, improved team approaches and less confrontation (Humphreys et al., 2003). Additionally, the contractors' and subcontractors' ways of working together may be facilitated and enhanced by structuring inter-organisational project teams "in such a way that there are frequent and durable interactions among specific individuals" (Welling and Kamann, 2001:33).

Many of the above mentioned practices concern the processes and practices in inter-organisational project teams. These are processes and practices aimed at the projects and the operational perspective on purchasing. By using the tentative definition of purchasing which was proposed in the beginning of this chapter, the



project perspective on purchasing has been incorporated into the strategic perspectives on purchasing in the analysis of purchasing and the exploration of purchasing processes and practises.



## 3 Method

### 3.1 *Research approach and process*

This thesis is based on two studies: (1) a two-year case study carried out as an industrial PhD student employed by a large construction company; and (2) an interview study with three large construction companies and their subcontractors. Study 1 is composed of two sub-studies, and Study 2 was initiated with a pre-study.

Given the aim of this thesis is to explore purchasing processes and practices in large Swedish construction companies and to suggest ways of improving purchasing, a qualitative, interpretive approach was chosen. Qualitative research aims to “achieve an understanding of how people make sense out of their lives, delineate the process of meaning-making and describe how people interpret what they experience” (Merriam, 2009, p.14). Moreover, interpretive research assumes that there is not one reality, but rather multiple interpretations of reality of single events which are bound to specific contexts (Merriam, 2009). This qualitative, interpretive approach suited my ambition to depart from within the practitioners’ perceptions of their reality in my seeking to understand purchasing in large construction companies. Several qualitative data collection methods such as observations, informal conversations, individual interviews and document analysis have been used, and are further described and discussed in sections 3.2 and 3.3. First, a brief description of the studies is presented.

During study 1, I was employed as supply management specialist within the supply management specialist group at the purchasing department of a large construction company. The company is active nationwide in Sweden. I worked in a development project focusing on developing tools and methods for supplier development as well as managing supplier relationships. Two sub-studies were carried out in the development project. Sub-study 1.1 focused on a specific contractor-supplier relationship, further described in Paper I. This sub-study explored how purchasing was conducted within the large construction company and how supplier relationships were managed in the studied supplier. Sub-study 1.2 explored the strategic purchasers’ views on necessary criteria for achieving efficient contractor-supplier relationships (see Paper II).

As I was part of the purchasing department I had the opportunity to follow and observe the reasoning and the ways of working of strategic purchasers, i.e. category managers as well as of other staff such as sourcing specialists, content

specialists, purchasing group managers, purchasing managers and the purchasing director, within the central purchasing department. Based on these observations, Paper III discusses perceived barriers to integration of the purchasing department, projects and suppliers.

Study 2 concerned three large construction companies active in Western Sweden, and complements Study 1 by adding the project perspective and the project participants' perspectives on purchasing. In order to gain increased knowledge and understanding of these companies and their ways of working, a pre-study was carried out including 20 explorative semi-structured interviews with representatives from four companies: three large construction companies and one rental company of construction machinery and equipment. The results of this pre-study provided background information of the project context and of the studied companies. The pre-study resulted in three conference papers (see Josephson et al., 2009; Polesie, 2010; Polesie et al., 2009). The impressions from this pre-study led to Study 2, which formed the empirical base for Papers IV and V. The focus of Study 2, was on site managers in the three construction companies as well as on the subcontractor foremen with whom the site managers were currently working. This opportunity to change focus from the purchasing department to the projects and the project participants gave me a greater understanding of how purchasing is managed and carried out in construction projects.

## **3.2 Study 1 – Purchasing in a large construction company**

### **3.2.1 Research method – Case study**

The research method used in Study 1 was a case study. Case studies are in-depth investigations of contemporary phenomena in their real-life contexts when the boundaries between the studied phenomenon and its surrounding context are not evident (Yin, 2009). Merriam (2009) stated that the single most important characteristic of a case study is the delimitation of the object of study. In Study 1, the object of study is the purchasing department, and the focus of the study is purchasing in a large construction company. Dyer and Wilkins (1991) pointed out the benefits of a single case study over multiple cases as more in-depth understanding of the studied object may be gained (e.g. Eisenhardt, 1989). Case studies also enable the use of multiple sources of evidence (Yin, 2009). Pluralistic methods for data collection mitigate bias, enable triangulation and enhance contextual sensitivity (Dainty, 2008; Yin, 2009). In Study 1, data collection methods included observations, informal conversations, formal meetings, interviews, group discussions, a mini survey and reviews of documents and statistics, which are summarised in Table 1 and further covered in section 3.2.2.

When carrying out case study research, the selection of cases to study should be well-considered and well-motivated (Silverman, 2005). Study 1 is a revelatory case (Yin, 2009) as access had been gained to a purchasing department and its work with purchasing and supplier development, making it possible to investigate and explore purchasing in a large construction company from an insider perspective. Study 1 was collaboratively initiated by Chalmers and the large construction company as part of an EU project on industrialisation in supply (see Koch, 2011). At the time the company was going through a major purchasing transformation. As a result of this process, the development project was initiated in the company, and Study 1 was part of the development project. Hence, the large construction company was selected as the case study organisation due to its focus on purchasing and supplier development.

For sub-study 1.1, the relationship between the construction company and a rental company of construction machinery was chosen. The supplier was chosen due to it being the construction company's largest supplier<sup>5</sup>. In addition, the time-frame of the existing framework agreement made the specific supplier suitable for study. The framework agreement was up for renegotiation, which made it possible to discuss the inclusion of development activities in the new agreement. Furthermore, as the supplier is a subsidiary to the contractor, relationships differs from when external suppliers are used. The supplier, for instance, delivers approximately 80 per cent of its turnover to the contractor, making the contractor a very important customer. This has encouraged long-term thinking in the relationship from both organisations and also provided access to the supplier's organisation, which facilitated the collection of data.

### **3.2.2 Data collection and analysis**

During Study 1, observations and individual interviews were used as the primary data collection methods. As a complement, group discussions, a mini survey and documents reviews were carried out. The data collection methods are summarised in Table 1.

---

<sup>5</sup> One subsidiary to the construction company is a slightly larger supplier, but was not selected for sub-study 1.1 as it was used solely for import of material and is managed by the contractor's purchasing department.

**Table 1. Methods for data collection in Study 1**

<i>Type of method</i>	<i>Details</i>
<b>Observations</b>	2 years participatory observations within central purchasing department Several informal conversations daily with category managers, sourcing specialists, content specialists, purchasing group managers, purchasing managers and the purchasing director 3 individuals featured as key informants: 2 category managers, 1 sourcing specialist Meetings as part of the everyday work within the supplier development project Meetings as part of the everyday work within supply management specialists group Annual two-day seminars with central purchasing department
<b>Interviews</b>	37 interviews; 45-90 minutes per interview  Contractor: 8 category managers; 4 purchasing group managers; 8 site managers; 2 foremen Supplier: 7 business managers; 4 sales representatives; 2 key account managers; 2 service and logistic staff
<b>Group discussions</b>	1 group discussion with 2 of 3 key informants 2 feedback seminars with reference group
<b>Mini survey</b>	3 sales representatives from a supplier noted details on orders during one week
<b>Other data sources</b>	Annual reports, purchasing statistics for the internal database, framework agreements, decision of the purchasing transformation, website

## Observations

Continuous observations of the case organisation were conducted during my daily work over two years. Yin (2009) differentiated between direct observations and participant observations. In contrast to conducting direct observations, participant observations imply that one participates in the events being studied (Yin, 2009). Since I participated in the organisation which I studied, the observations in this thesis are categorised as participant observations. Gold (1958) presented four different stances of the relationship between the observer and the case study organisation, ranging from being a complete participant to being a complete observer. Next to the extreme of being a complete participant is participant-as-observer, which according to Bryman and Bell (2007) is applicable when a researcher is employed in the studied organisation, as was the case here. The participant-as-observer role implies that the researcher's observer activities are subordinated the role as participant and that the members of the studied organisation are aware of the researcher's role as researcher (Merriam, 2009), as in Study 1. Participant observations entail benefits such as gaining access to the case study organisation and opportunities to "perceive reality from the view-point of someone inside the case study" (Yin, 2009:112). Problems are, however, associated with the researcher becoming a supporter of the case organisation, that

the role as participant takes attention from the role as observer and that the researcher might find it difficult to be at the right place at the right time (Yin, 2009).

A primary source of information has been informal conversations which occurred many times every day. The informal conversations have mainly been with the staff at the central purchasing department located at the Gothenburg office. Category managers, sourcing specialists, content specialists, purchasing group managers, purchasing managers and the purchasing director have been recurrent counterparts in these conversations which took place during work, coffee breaks, travels and after-work activities. Three individuals within the purchasing department featured as key informants. These key informants were selected due to their openness and willingness to describe their ways of working and to share their experiences, reflections and the challenges they encountered during their daily work. These individuals described challenges and how work was progressing on at least a monthly basis.

Formal meetings were also a source of information. Mainly two types of formal meetings were attended. The first type concerned the development of tools and methods for supplier development related to the project which I was working in. The second type related to the supply management specialists group where I was formally employed, and concerned implementation and development of suppliers and the group's support to the category managers. This group was the recipient of the outcomes of the development project. These meetings provided an opportunity to continuously revise and interpret the findings through discussions with the people in the case organisation.

During the observations, field notes were taken in order to document situations and activities of interest to my research. For example, people at the purchasing department talked about difficulties with the purchasing transformation and perceived problems in disseminating the benefits of the framework agreements to the projects. Analysis of these field notes formed the basis of the integration barriers discussed in Paper III.

## **Interviews**

During Study 1, 37 in-depth interviews were conducted: 12 with strategic purchasers in the construction company's purchasing department, 10 with site management staff of the company<sup>6</sup>; and 15 with staff at the studied supplier (see Table 1). The interviews lasted from 45 to 90 minutes and were conducted mainly

---

<sup>6</sup> For practical reasons two of these respondents were interviewed simultaneously.

at the respondent's office or in an adjacent room. The respondents had been chosen to be a representative sample of their respective group. Concerning the strategic purchasers, 12 of the strategic purchasers were interviewed, and six of these were responsible for material suppliers and six responsible for service suppliers. They were geographically spread between Gothenburg, Stockholm, Malmö and two smaller offices. Four were purchasing group managers in addition to their roles as strategic purchasers. Of the ten respondent from the site management staff, eight respondents were site managers and two were foremen. The respondents were chosen to be a representative sample of the construction company's projects. They represented building and civil engineering projects of different sizes across the construction company's geographical area of operation. Regarding the selection of respondents at the supplier, a discussion was held with the supplier's CEO. Here the representative sample covered their three main geographic depots and their different business areas, i.e. cranes and elevators, barracks and containers as well as construction machinery.

The individual interviews complemented the observations by providing an opportunity for issues from the observations to be discussed and processed in a detailed and structured manner. In order to capture the issues raised by respondents as well as get answers to predefined questions, a semi-structured approach was used. Open-ended questions were used to avoid leading the respondents, who were encouraged to speak freely within the intended topic. To decrease misinterpretations follow-up questions were frequently asked. All interviews were audio-recorded with permission of the respondent, field notes were taken in order to capture what was said before and after the interviews as well as to note my reflections during the interviews.

Exercises were included in most of the interviews. The respondents, for instance, were asked to note on a paper activities which they perceived as apparent in relationships between the construction company and the supplier. The respondents were asked to specify criteria related to relationships with suppliers with framework agreement and also to rank these in order of importance, and argue why they ranked the criteria in that specific way. These exercises helped to better understand the respondents' views and answers and to obtain additional information from the respondents through asking probing questions related to the exercises.

The data collected from the interviews were analysed in various ways. Notes from the interviews were grouped and categorised in order to systematise the data and thereby help to identify issues that at first glance might not have been obvious. Accounts from the interviews were marked and labelled based on the topic



discussed. These accounts were then grouped, and the groups were again labelled. Recordings of the interviews were listened to with the aim of identifying different perspectives of the issues discussed during the interviews. The criteria which had been ranked by the respondent were also grouped so as to identify the criteria and statements that the respondents collectively considered to be most important; this also guided further analysis of the data by identifying new topics and connections to be looked for in the material. Since each analysis resulted in new insights, listening, grouping and analysis have been conducted in an iterative process.

### **Group discussions**

In addition to the observations and individual interviews, several group discussions were conducted with the dual purpose of exploring and testing ideas and findings. One example was when preliminary findings were presented during an audio-recorded three-hour group discussion to two of the three key informants. This resulted in additional insight regarding the integration barriers which were discussed and also in a revised categorisation of these integration barriers. Another example of group discussion was when I presented preliminary results of sub-study 1.1 to the strategic purchaser responsible for the supplier and to the supplier's management team. This discussion further increased my understanding of the strategic purchasers' roles in clarifying and visualising potential costs for the projects where the purchasing orders are signed, as well as reinforcing my understanding of the integration barriers between purchasing departments, projects and suppliers. In addition, the preliminary results were discussed in the PhD project's reference group consisting of suppliers, construction companies, a construction client and a representative from one of the financing bodies that met yearly. These group discussions resulted in further analyses of the data.

### **Mini survey**

Additionally, a mini survey was carried out in order to get more information on the construction company's ordering processes which had been mentioned in the interviews in sub-study 1.1 as a weakness in the interface between the contractor and the supplier. This mini survey complemented the existing order statistics supplied by the studied supplier.

In this mini survey, three sales representatives from the supplier studied in sub-study 1.1 made notes on each order from the contractor during one week. To obtain a representative sample, each of the sales representatives chosen worked with construction machinery at one of the supplier's three main depots. The notes highlighted when the order was made and when delivery to the ordering project was required. The data was then analysed and the orders were categorised

according to the notes made by the respondents. Four categories were found, based on the existing framework agreements, where orders of two days' notice or more represented one group, orders requested the next day, orders requested the same day and orders requested instantly represented the other three categories, respectively.

## **Documents**

Documents providing background information for the study and supplying details concerning for instance supplier statistics and purchasing volumes were used. These were for example annual reports, purchasing statistics from the case organisation, order statistics from the studied supplier organisation, framework agreements as well as the proposal and decisions that were the foundation for the transformation of the purchasing function within the case organisation.

It should, however, be noted that these documents, particularly the statistics, were taken directly from the case organisation's internal systems without critical review. Nevertheless, these numbers are the ones used by the case organisation for internal performance measuring and evaluation, which does not guarantee their correctness, but did provide contextual information.

## **3.3 Study 2 – Project perspectives and subcontractors**

### **3.3.1 Research method – Interview study**

Study 2 was a qualitative study based on in-depth interviews. The focus of the study was the relationships between site managers and subcontractors' foremen as well as their influence on purchasing of subcontractor services. Interviews were conducted with site managers from three construction companies in Western Sweden with turnovers that ranged from 408 to 1,192 MSEK and between 106 and 164 employees. Two interviews were carried out with each contractor as illustrated in Table 2. The companies had been selected for the study due to their interest in development activities, and all had been included in the pre-study. Due to this interest, access to the companies and the site managers was facilitated. In addition, nine subcontractors were included in the study. The respondents from the subcontractors were selected by the respondents from the construction companies and the selection process is elaborated on in the section below. The turnover of eight of the subcontractors ranged between ten and 65 MSEK and the number of employees from eight to 53, see Table 3. The ninth company deviated from the rest regarding turnover and number of employees. This company was much larger than the other eight and had a turnover of 1,745 MSEK and 1,200

employees. Due to this difference relative the other eight companies, this company was included in Paper IV but not in Paper V.

**Table 2. The site managers in Study 2 and their current projects**

<i>Contractor</i>	<i>Type of Site Manager's Current Project</i>		<i>Approx. Sum of Contract (SEK)</i>
A	Senior apartments	New/refurbishment	40 M
A	Apartments	New	34 M
B	Hospital	Refurbishment	63 M
B	Offices	Refurbishment	40 M
C	Apartments	New	270 M
C	Apartments	New	400 M

**Table 3. Subcontractor respondents in Study 2, their positions and company details**

<i>Respondent's Position</i>	<i>Profession</i>	<i>Turnover</i>	<i>Employees</i>
Owner, CEO and Foreman	Painting	10 M	16
CEO and Foreman	Waterproofing	60 M	21
Owner and Foreman	Landscaping	18 M	8
Owner, CEO and Foreman	Casting	60 M	26
Owner, CEO and Foreman	Ventilation	35 M	18
CEO and Foreman	Demolition	30 M	17
Foreman	Painting	30 M	40
Owner, CEO and Foreman	Smithery	65 M	53
Project manager	Prefab concrete	1 745 M	1 200

### **3.3.2 Data collection and analysis**

During Study 2, data were primarily collected through interviews. Group discussions were used to discuss the preliminary results and as an additional data collection method. Documents also provided contextual information. A summary of the data collection methods from Study 2 is presented in Table 4.

#### **Interviews**

15 semi-structured in-depth interviews based on open-ended questions were conducted. Each interview lasted for approximately one and a half hours and was conducted at the respondent's place of work. Before the interviews an interview

guide was written in order to structure the data collection (Bryman and Bell, 2007). All interviews were audio-recorded and transcribed verbatim. Notes were taken during the interviews and my reflections were summarized and noted after each interview. An additional interviewer participated in four of the interviews.

**Table 4. Data collection methods in Study 2**

<i>Type of method</i>	<i>Details</i>
<b>Interviews</b>	15 interviews; 90 minutes per interview 3 contractors: 6 site managers 9 subcontractors: 8 foremen; 1 project manager
<b>Group discussions</b>	1 seminar on preliminary results with reference group 1 seminar on preliminary results with industry representatives
<b>Other data sources</b>	Annual reports, websites

At each of the three construction companies, a contact person recommended two site managers for interviews. The criteria for the choice of site managers were that they should currently be running a project with subcontractors involved and that they should have been involved in the subcontractor selection process. In one company, three project managers were recommended two of which were randomly selected for interviews. However, two of the site managers were managing projects that as yet had only few subcontractors involved.

From their ongoing project each of the six site managers selected one subcontractor which they would like to work with in the future and one subcontractor which they would not like to work with in the future. The selection of the respondents from the subcontractors was inspired by the theoretical replication process where each respondent is carefully selected so that it predicts contrasting results (Yin, 2009). Through this conscious selection, findings are expected to better represent the current situation at the project level. Two site managers were, however, reluctant to disclose examples of subcontractors which they did not want to work with in the future. Also, one of the subcontractors declined to participate in the study. Thus the data was obtained from nine subcontractors selected by six site managers.

Of the nine respondents at the subcontractors, eight were foremen, in several cases in parallel to having other roles, as shown in Table 3. Their roles as foremen entailed managing the contract of the current project and being the site manager's contact during the project. The small size of the companies is one reason why the

foremen were also often CEOs and owners of the company. One respondent did not have the role of foreman but had the title of project manager<sup>7</sup>. His duties, were, however, similar to those of the foremen. The roles of the respondents were chosen since they are the ones who have the day-to-day contact and are financially responsible for the project and the purchased subcontractor services.

The site managers were questioned about their current project, about the subcontractors in their current project and issues related to their relationships with the two selected subcontractors' foremen. The nine selected subcontractors' foremen were asked about their current project and their relationships with two specific site managers: one they desired to work with and one they did not want to work with as well as about their relationship with the site manager who had selected them for the study.

The transcripts from the interviews as well as the notes were analysed, grouped and categorised. During the first analysis, the transcribed material was reduced by selecting data that was relevant to the investigated research questions. Each account was labelled, and my interpretations regarding each account were noted. In each interview, preferred characteristics of site managers and subcontractors' foremen were identified. These were grouped, and the groups then labelled. This is presented in Paper IV. Also, accounts of practices of achieving cooperation between site managers and subcontractors' foremen were included in my notes. These accounts were compared and three characteristic groups of practices for achieving cooperation were identified. This is further discussed in Paper V. Reading transcripts, categorisation and analyse were conducted in an iterative process.

### **Group discussions**

Preliminary results were presented and discussed with representatives from the construction industry. Both the research council of one of the funders as well as the steering group in the research project consisting of people from the companies involved in Study 2 were presented the preliminary findings. Insights from these discussions were incorporated in the analysis and the results of the study. Furthermore, preliminary results were presented and discussed during courses given to construction practitioners.

---

<sup>7</sup> This project manager's company was much larger than the other eight and had a turnover of 1,745 MSEK and 1,200 employees.

## **Documents**

Additionally, documents provided background information in Study 2. Annual reports and the companies' websites provided information on strategies, organisational settings as well as other company information, e.g. size, turnover and geographical spread of their markets.

### ***3.4 Reflections on the method***

During my research process my view on research and the interaction between research and its context has shifted. Due to my background within engineering and business administration, my initial focus was to solve practical problems. Later in the research process my focus instead shifted towards the understanding of problems. This is reflected in my research questions, of which the second focuses on identifying criteria whereas the first and third are focused on the connections between, for instance, the organisation of purchasing and buyer-supplier relationships and how these influence one another.

Regarding the data collection, several actions were taken to mitigate bias. Even though the possibility exists that I have been influenced by the people within the case organisation in Study 1 to a greater extent than I realised, a reflective and critical stance has been maintained during the study. This through, for instance, presentations and discussions of my interpretations with peers and supervisors at the university, both individually and in workshops. As the industrial PhD project was funded through a European Erabuild project, the preliminary results were also discussed on four occasions with academics from Denmark, Finland and France.

Concerning the selection of respondents for the interviews, in Study 1 I have chosen most of the interviewees, on some occasions together with representatives of the case organisation. Due to this, there is a risk that the answers and opinions may not be representative of the organisation as a whole. This is also a risk for Study 2, even though the site managers were selected through contact persons in the involved companies, and the site managers in turn selected the subcontractor foremen. Furthermore, as the respondents were aware of my role as researcher and of the research topic, their answers might have been biased towards satisfying the interviewer rather than providing their true opinions and views. In addition, the respondents may have tried to portray their companies and projects from an ideal state rather than the actual state. I have attempted to minimise the impact of the above by follow-up questions and informal talks before and after the interviews as well as basing parts of the interviews on specific examples instead of abstract situations.

Furthermore, both studies have a buyer's perspective. Since most of my experiences from Study 1 came from a buyer's organisation my reasoning starts from this perspective. I have, however, interviewed one supplier in Study 1 as well as both parties of the contractor-subcontractor relationships in Study 2 in order to better understand the relationship between buyer and supplier. The buyer perspective might also be argued for since the selection of respondents started within the buyers' organisations.

The two studies complemented each other in many ways. While Study 1 provided increased understanding from the perspective of the central purchasing department, Study 2 complemented this understanding by providing the perspective of the construction projects. Study 1 focused on a large nationwide construction company and its suppliers in general while Study 2 complemented it by focusing on subcontractors, which constituted a large part of the construction companies' purchasing. The different characteristics of the two studies also have positive implications since they have provided possibilities to identify differences and similarities across the studies. As the analysis was conducted in an iterative manner, Study 2 also made me look at Study 1 with new insight. This is reflected in Paper III where a more critical view of the case organisation in Study 1 has been taken.

In conclusion, the research in this thesis has been presented at academic conferences (Papers I: Frödell and Josephson, 2008 and IV: Frödell and Josephson, 2012), peer-reviewed for publication in academic journals (Papers II: Frödell, 2011 and III: Frödell et al., 2013) and discussed during several work-in-progress seminars and at the licentiate thesis seminar (Frödell, 2009), which has contributed to raise the quality and contribution of this research.





## 4 Summary of the papers

This thesis is based on five papers. In addition to fulfilling the specific aim of each paper, the papers have contributed to answering the three research questions. Along with the main results, the contribution of each paper is presented in the following sections as well as the papers' part of the thesis as a whole.

To recapitulate, the three research questions of this thesis are:

*RQ 1) How does organisation of the purchasing function influence relationships with suppliers?*

*RQ 2) What criteria do construction companies use to achieve "good" relationships with suppliers with framework agreements?*

*RQ 3) What influence do site managers and/or subcontractor foremen have on the selection of subcontractors?*

The papers focus on interactions within large construction companies as well as relationships between construction companies and their suppliers, see Figure 1. Four papers – I, II, IV and V – have an external approach, focusing on construction companies' relationships with suppliers whilst one paper – III – combines an internal and an external approach. Papers I, II and III are based on Study 1 and Papers IV and V are based on Study 2.

### **4.1 Paper I – Initiating supplier development through value stream analysis: The case of Skanska Sweden and its largest supplier**

Based on a case study at Skanska Sweden, this paper aims to identify strengths and weaknesses in the interface between a large Swedish construction company and its largest supplier. Value stream analysis and service blueprinting were used to guide and structure the data collection.

The knowledge the supplier has concerning the products to be delivered is an important factor for the contractor and is considered the greatest strength of the relationship. The case study also shows that suppliers are given very short notice of orders, which makes it difficult to predict buyer demand, and this is identified as the biggest weakness. To cope with the short-notice orders from the buyer, the supplier's activities are kept flexible, allowing for a variety of ways of carrying out the activities. Moreover, supplier personnel exert themselves to fulfil the needs of the projects which, though well appreciated by the contractors' site management, does imply negative consequences for the supplier as, for instance

supplier personnel having to abandon their intended duties and processes. An example of this is when, in urgent cases, the supplier's sales personnel personally deliver machines to projects.

This paper contributes with an empirical example of the relationship between contractor and supplier, and by presenting examples of strengths and weaknesses in the relationship. The paper shows how internal contractor problems result from different parts of the contractor's organisation signing the agreement with the supplier and executing the purchasing orders.

#### ***4.2 Paper II – Criteria for achieving efficient contractor-supplier relations***

Based on 12 in-depth interviews with strategic purchasers within a large construction company (Skanska Sweden), the purpose of this paper is to identify criteria for achieving efficient contractor-supplier relationships in construction. Achieving efficient contractor-supplier relationships may reduce costs and lead times through reciprocal involvement by contractor and supplier in the interface-related value creating processes. The paper draws on studies of buyer-supplier relationships.

The paper shows that the criteria are divided into input criteria (enablers), throughput criteria (activities) and output criteria (results). The most critical criteria, i.e. relationship enablers, are total cost focus, aligned core values, as well as willingness and the capability to collaborate and develop. Even though the respondents focus on the importance of activities in the relationship, further analysis of their perceptions revealed an underlying concern regarding the enablers of the relationship itself. Many of the enablers are dependent on continuity in the relationships; therefore, a long-term orientation on the part of the buying organisation is important. Such long-term orientation requires the commitment of the top management of the company.

The contribution of the paper is the identification of criteria for an efficient relationship between a construction company and those of its suppliers with framework agreements. Also, the paper contributes by emphasising the need for the buying company to control their own processes before approaching suppliers with long-term agreements.

### **4.3 Paper III – Integration barriers for purchasing organisation in a large construction company: towards requisite disintegration**

Based on a two-year case study of a large construction company (Skanska Sweden), the aim of this paper is two-fold: firstly, the development of a theoretical framework to characterise the purchasing organisation and its relationships with suppliers, and secondly, to analyse the limited adoption of integrated purchasing through an analysis of barriers to integration. The paper takes its point of departure in the literature on organisation of purchasing and focuses on the interaction between the central purchasing function and the projects as well as relationships with suppliers.

Six perceived integration barriers were identified. Two internal integration barriers are (1) the framework agreements subordinate status compared to the purchasing orders and (2) the short-term incentive systems for the strategic purchasers within the central purchasing function. Two integration barriers that are a mixture of internal and external barriers are (3) the inconsistent ways of working within the projects and the related difficulties for suppliers to develop their ways of working and (4) the central purchasing department's diminished influence on the procured products derived from clients' demands. Two external integration barriers are (5) the interpretation of the geographical conditions where the contractor is a national actor, but many of the suppliers act on a local market and (6) the interpretation of the market changes over time, which influence the contractor's consistency towards the suppliers. The internal integration barriers impede integration between the contractor's purchasing department and the projects, while the external integration barriers impede integration between the construction company and its suppliers. The paper proposes a mediating, yet requisitely disintegrated, organisation of purchasing based on reduced ambiguity on the part of top management and enhanced collaboration between purchasing department, projects and suppliers. This organisation of purchasing would reduce the risk of loss of local knowledge and embeddedness of the projects while still accentuating the purchasing expertise within the purchasing department.

Paper III contributes to the literature on organisation of purchasing, and the literature on construction supply chain management by identifying six integration barriers and by explaining how internal and external integration may be hindered or facilitated through the organisation of the purchasing function. The paper also contributes to the purchasing literature - which mostly sees the organisation as one entity - by making a distinction between the central purchasing function and the projects when analysing supplier relationships. Additionally, the paper

contributes by showing the effects of incongruent goals and ambitions driving different functions within the organisation.

#### ***4.4 Paper IV – Reproduction of exchange relationships: Changing focus from organisations to individuals***

Based on 15 interviews, Paper IV explores how dyadic exchange relationships between site managers and subcontractor foremen are produced and reproduced. The paper draws on the construction supply chain management literature. Three themes crystallised during the interviews with the site managers and three themes during the interviews with the foremen. Site managers discussed what makes certain subcontractors better than others, the importance of the specific individual in the role of foreman, and their views on price as a driver during procurement. The foremen discussed the preferred characteristics of site managers, the management of additional costs during the project and the additional costs related to specific site managers.

The paper shows that site managers prefer subcontractors who are autonomous and manage their problems on their own. That subcontractors put extra effort into their work is also appreciated as is a positive attitude. The subcontractor foremen have a preference for site managers who are good leaders that are able to keep the involved parties on schedule and who provide the subcontractors with conditions that permit them to work efficiently. Both site managers and subcontractor foremen agree that individuals within the relationship play important roles for the outcome of the project. A majority of the site managers consider the subcontractor foreman as decisive for the performance and outcome of the project, and the subcontractor foremen claim that specific site managers are decisive for project profitability. Despite this, the organisational focus of the purchasing of subcontractor services is based on the lowest bid and makes the projects select the subcontractors with the lowest price for the contract.

The paper contributes to the construction supply chain management literature by highlighting the contradictions between the importance of the individual and the prevalent organisational focus on lowest price purchasing. The paper also contributes by showing and arguing that the perspective of the individual combined with that of the organisation need to be taken into account when analysing contractor-supplier relationships.

#### **4.5 Paper V – Integration and cooperation during subcontractor procurement in construction projects**

Drawing on 14 interviews, this paper explores vertical cooperation during subcontractor procurement by investigating how site managers and subcontractor foremen intervene in the subcontractor procurement processes in order to form preferred inter-organisational project teams in construction projects. The paper draws on the construction supply chain management literature.

While the general perception within the construction supply chain management literature is that price is considered the most important factor in the purchasing process, when studying key individuals in contractor-supplier relationships three practices for achieving cooperation are identified which show deviations from this prioritisation. The three practices for achieving cooperation are highlighted by the site managers and subcontractor foremen as means of achieving a well-functioning process and, hence, reduced total costs of the relationship between contractor and subcontractor. Firstly, site managers give subcontractors the opportunity to recalculate quotations. If the preferred subcontractor is not the lowest bidder, the preferred subcontractor is thus able to adjust the quotation so that the site manager will be able to justify to his/her superiors the choice of subcontractor. Secondly, site managers request specific subcontractor individuals since they consider the performance in the project as dependent on specific workers rather than on companies. Thirdly, some subcontractors choose to work only with recurring customers in order to better be able to predict the results of the project and to obtain a higher success rate for submitted quotations.

This paper contributes to the construction supply chain management literature by providing empirical examples of practices to achieve cooperation during purchasing of subcontractor services. Even though price focus still prevails at the organisational level, the paper provides empirical evidence contradicting the current conception of the construction industry as adversarial and short-term. The paper shows how known practices and organisational pressures is played by people in inter-organisational project teams in order to foster cooperation between contractors and subcontractors in spite of the focus on price. The paper nuances the current perception of the construction industry in general and of purchasing of subcontractor services specifically.



## 5 Discussion and conclusions

The aim of this thesis is twofold: (1) to explore purchasing processes and practices in large Swedish construction companies regarding organisation of purchasing and buyer-supplier relationships, and (2) to suggest ways of improving purchasing. Three research questions have been posed, each of which is discussed in the following sections.

*RQ 1) How does organisation of the purchasing function influence relationships with suppliers?*

*RQ 2) What criteria do construction companies use to achieve “good” relationships with suppliers with framework agreements?*

*RQ 3) What influence do site managers and/or subcontractor foremen have on the selection of subcontractors?*

### 5.1 Organisation of purchasing

In order to be competitive, large construction companies in Sweden have included coordination of purchasing as a strategic issue, as is reflected in annual reports and internal strategic documents. As stated in these documents, one means of achieving this coordination is to increase agreement compliance in long-term agreements with suppliers. Note that even though mainly concerned with material suppliers, these long-term agreements can embrace either material suppliers or specialist contractors. In construction, the organisation of the purchasing function tends to be carried out both between the purchasing department and suppliers, and between projects and suppliers, which complicates any attempts at integration (see Figure 1).

The first research question investigates how organisation of the purchasing function influences relationships with suppliers. This thesis addresses this question by (1) identifying six integration barriers that hinder both internal and external integration, and by (2) characterising four modes of organisation of the purchasing function in large construction companies and their implications for supplier relationships. These two aspects will be discussed below.

As discussed in Paper III, the identified integration barriers can be internal, external or a mixture of both. Integration is here viewed as “the process of incorporating or bridging different groups, functions or organisations [...] to work jointly [...] on a common business-related assignment or purpose” (Monczka et al., 2009:114). An example of mixed internal and external barriers

is the variety of ways of working within and between the projects, which creates inconsistency. The variety is due to site managers choosing their own established and local practices and methods of ordering and delivering to the projects. This, in turn influences the interface with the suppliers since these have to adapt and change their routines according to the practices of the different projects. Due to these different practices, relationships with suppliers suffer in terms of continuity and consistency. Martinsuo and Ahola (2010) argued that continuity, and consequently consistency, are important for the external integration of suppliers to mitigate tendencies of exercising too much control of the individual projects, something which hinders external integration. Hence, a lack of internal integration creates practices that impede the possibilities for external integration with suppliers from a strategic perspective (Paper III).

External integration from a strategic perspective consists of e.g. supplier development, supplier evaluation and feedback, whereas seen from the operational perspective it consists of e.g. utilisation of inter-organisational resources for integrated project teams (Martinsuo and Ahola, 2010). Martinsuo and Ahola (2010) also showed that repeated relationships between buyer and supplier, i.e. relationships stretching over several projects, are necessary to develop viable working practices over time. This project perspective on external integration is supported in Papers IV and V, where the site managers studied tended to circumvent the organisation's purchasing procedures in order to work with their preferred suppliers. Hence, the site managers formed inter-organisational teams together with the suppliers that they preferred to work with. This practice would incorporate specific groups and organisations that the site managers believed would facilitate project execution. This data accords with the views concerning integration of Monczka et al. (2009).

In order to create a continuous and consistent interface towards suppliers, there is a need for a commonality of practice between buyer and supplier that can be accepted by both the purchasing department and the projects, i.e. by the strategic and the operational levels. The influence of internal integration on external integration is in line with propositions by Hillebrand and Biemans (2003), who suggested that internal integration, i.e. interfaces between functions within the organisation, is a prerequisite for external integration, i.e. collaboration with other organisations. Based on the studies in this thesis, I have provided examples on how internal integration influences relationships with suppliers in construction companies.

Few studies have discussed organisation of the purchasing function in construction companies. Exceptions are Dubois and Wynstra (2005) and



Ellegaard and Koch (2012). The former based their discussion of the role of the purchasing function in a construction company among others. In their example of the construction company they showed that the practice is generally that the purchasing department chooses suppliers with whom they sign framework agreements. The projects are then meant to use these given suppliers. The results from my study, however, indicate that in the construction companies' purchasing practice purchase orders have precedence over the framework agreements established by the purchasing department thereby creating an integration barrier. For example, a respondent from the purchasing department stated that "the framework agreements may be good for our suppliers but in the end it is the actual order that matters" (Paper III). Another example is a respondent, working as a supervisor in a construction project, who said that the only way to get the site manager in his current project to use the framework agreements would be if these happened to be with the suppliers the site manager prefers.

The problem from a strategic perspective is that the site managers have different preferred suppliers both in terms of each other and in terms of ones the purchasing department has chosen. This empirical example in this thesis of site managers deviating from the framework agreements supports Ellegaard and Koch's (2012) findings from a case study at a large construction company. They found that one reason for this deviation was that the site managers were convinced that the prescribed suppliers were not the cheapest for the particular project. Ellegaard and Koch (2012), as well as my examples show that, at the strategic level, project practices concerning relationships with suppliers are an important factor to take into consideration when creating integrated purchasing processes and practices.

Internal integration and related challenges for large construction companies remain under-researched in the purchasing literature, especially when the organisation of the purchasing function is discussed. Instead, it is often presumed in the literature that an organisation acts as one entity, which is reflected in the definitions of purchasing available (e.g. Monczka et al., 2009; van Weele, 2005). Through empirical examples I have shown that purchasing in construction companies is more complex. In spite of strategic documents, purchasing policies and formulated practices described in internal documents, all of which advocate a common practice, the projects live their own lives. It is therefore important to take the project perspective into consideration when exploring purchasing processes and practices in construction companies. Moreover, this complexity also shows the need for a revised definition of purchasing in construction. The tentative definition suggested in Chapter 2 captures these internal aspects as well as the importance of internal integration.

Based on the integration barriers found, four modes describing the organisation of the purchasing function have been presented in Paper III: Centralised, Mediating, Parallel and Decentralised. The four modes show how internal integration influences external integration. What distinguishes the two intermediate modes, Mediating and Parallel, is the degree of integration between the purchasing department and the projects. In the parallel mode, which is the less integrated, the purchasing department and the projects form their own processes with the suppliers, in terms of those with framework agreements. A consequence of adopting the parallel mode is, as one supplier explained, that suppliers need to market their products twice to the construction company: once to the purchasing department in order to get a framework agreement, and once to the project in order to get the actual purchasing order (Paper III). Hence, the suppliers have a dual interface to the construction company. This dual interface is disadvantageous to the construction company in that similar purchasing efforts are spent both in the purchasing department and in each project (Karjalainen, 2009). In order to overcome this, the organisation of the purchasing function needs to move from the parallel mode to the mediating mode (Paper III).

In the mediating mode both the purchasing department and the projects have a common approach towards the suppliers, and thus the suppliers have a unified interface to the construction company. In order to reach the mediating mode the identified integration barriers need to be surmounted. Previous research has found examples aimed at increasing internal integration through the use of cross-functional teams where site managers and strategic purchasers from the purchasing department work together with the suppliers (Ellegaard and Koch, 2012). Improved internal systems and processes have also been proposed (Zhao et al., 2011). Thus, as cross-functional teams and coherent internal systems and processes would enable construction companies to overcome internal integration barriers such as the subordinate status of framework agreements discussed above, they are possible methods to enhance internal integration. However, as shown in Paper III, top management has to be committed and also be clear about where in the organisation activities and decisions should be located in order to realise a more integrated organisation of the purchasing function.

Another issue are incentives systems, which seem to act as barriers to achieving a more integrated organisation of purchasing. In an example from Paper III, one of the strategic purchasers from the purchasing department stated that he would have been able to negotiate even lower prices from one of the suppliers than those specified in the framework agreement. However, the structure of the incentives system made it more advantageous to renegotiate the agreement with that supplier

again the following year and, hence, lower prices two years running instead of only once in the two years. Consequently, the company's incentives system encourages personnel in the purchasing department to choose a short-term solution since that is most beneficial to them. This short-term solution implies that the framework agreements which are presented to the projects are not as advantageous as they could have been had the staff of the purchasing department acted for the good of the organisation rather than as encouraged by the incentives system. Therefore the projects, i.e. the site managers, will choose their own preferred suppliers as these are considered cheaper. Consequently, the incentives systems need to be aligned with the formulated long-term orientation in policies and purchasing propositions, as is also highlighted in these companies' annual reports. Such a long-term orientation of the incentives systems would be a step towards surmounting the integration barriers.

By shifting to a mediating organisation of the purchasing function, relationships with suppliers would improve since suppliers would have a unified interface to the buyer. This is also in line with the large construction companies' strategies which promote their ambitions to coordinate purchasing. Hence, not only do the company perspectives and the project perspectives need to be considered when discussing purchasing in construction, but what is more important, these two perspectives need to be integrated for construction companies to improve purchasing.

## **5.2 Criteria for "good" buyer-supplier relationships**

In addition to the issues above, the large construction companies are working to lower the costs of purchased materials and services as well as to increase the efficiency of the processes shared with their suppliers. This is reflected in the construction companies' strategic documents, both external (e.g. annual reports) and internal (e.g. purchasing policies). One of the ways these companies decrease costs and increase efficiency is by signing framework agreements with certain suppliers. The question then arises how the construction companies develop their relationships with these suppliers. The second research question attempts to determine what criteria construction companies use to achieve "good" relationships with those suppliers they have framework agreements with. The question has been addressed by (1) identifying criteria that are prioritised by the purchasing department studied in their relationships with suppliers with framework agreements, and (2) identifying what criteria are prioritised in the projects concerning their relationships with suppliers with framework agreements. Based on the identified criteria, the answer to the research question

is that what criteria are prioritised largely depends on who does the choosing, i.e. whether it is the strategic purchasing department or the operational projects.

The case study described in Paper II shows that the purchasing department considers relationship enablers such as sharing of information, commitment and effective communication as prioritised criteria for achieving “good” relationships between construction companies and their suppliers with framework agreements. These findings support studies in the purchasing literature that have investigated long-term relationships, which similarly highlight criteria such as effective communication and information sharing (e.g. Krause, 1999; Monczka et al., 1998; Ryu et al., 2009). Moreover, these authors also argued that a strategic long-term perspective is a necessary criterion for the buying company in order to develop “good” relationships with suppliers.

In addition to the relationship enablers, the findings in Paper II show that purchasing activities such as feedback to suppliers, development work and the use of interactive procurement are also seen as prioritised criteria (see Figure 1 in Paper II). As purchasing activities, the respondents included activities on the project level such as adhering to framework agreements and providing the suppliers with the appropriate prerequisites. The respondents highlighting of these two perspectives reflects the importance of considering, alongside the strategic perspectives, the operational perspectives of purchasing. In current buyer-supplier relationship studies the operational perspective of the buying organisation tends to be ignored, resulting in an incomplete understanding of purchasing processes and practices. In this thesis I have attempted to bridge this gap. More research is, however, warranted.

From a project perspective the picture looks different. Here, flexibility and smoothness of the processes for the specific project are prioritised criteria for “good” buyer-supplier relationships with suppliers with framework agreements (Paper I). Such a short-term perspective supports Fearne and Fowler’s (2006) conclusion that construction projects may need to bypass the long-term orientation of the company in order to be able to deliver the project in accordance with project goals and budget. An interesting finding in this thesis is, however, that the site managers in Papers IV and V tended to have a more long-term perspective on relationships with their project suppliers, i.e. those without framework agreements than did the site managers and foremen in Paper I in their relationships with suppliers with framework agreements. Since the data in Paper I and the data in Papers IV and V stem from different studies based on different companies, this claim may, however, be the result of different company cultures rather than of different project approaches to buyer-supplier relationships. Hence,

further research investigating relationships with suppliers with and without framework agreements is called for.

In Paper I, the site managers and foremen prioritised the customer focus of their supplier, and expressed satisfaction over the flexibility and the supplier's expertise in solving their problems in the specific project at hand. In none of the cases, did there seem to be any adversarialism in the relationship between the project and the chosen supplier with a framework agreement despite the project's short-term, arm's length perspective in terms of their focus on the specific project. Instead, the two parties worked towards a common goal, even if it had been set by the buyer. This would indicate that adversarialism and working closeness, i.e. collaborative/long-term vs. arm's length/short-term, are two independent characteristics of the relationship. These findings are in line with Cox (2001:5), who stated that working closeness and adversarialism are indeed two different characteristics in a relationship between buyer and supplier. This, however, contradicts previous studies of buyer-supplier relationships such as Fernie and Thorpe (2007), who conflated these characteristics in their study of long-term collaborative relationships, claiming that arm's length adversarial relationships are necessary. As they did not make a distinction between the two characteristics, these latter studies are difficult to interpret. Indeed, both short-term and long-term relationships are established practices in construction due to different contextual situations and conditions, but whether these relationships would benefit from high adversarialism is questionable. In this thesis I have shown through empirical examples, that distinguishing between working closeness and adversarialism in buyer-supplier relationships provides a better understanding of the complexities embedded in purchasing in construction.

The tensions between the strategic and operational perspectives within construction companies have been identified and problematized (e.g. Gluch and Räisänen, 2012; Samuelsson, 2006). These studies do not cover the purchasing context in construction companies. The need to account for these often contradictory perspectives becomes salient when investigating relationships with suppliers, be they material or service suppliers, with framework agreements, as evidenced in this thesis. On one hand, the criteria which were identified by the purchasing department as influential for "good" suppliers with framework agreements are long-term and, as mentioned earlier, mainly focused on relationship enablers. On the other hand, from the operational perspective, the criteria that are identified as influential are short-term: flexibility and adaptability to fluctuating conditions in the specific project. As a result of this argument, both the strategic and operational perspectives need to be included in a definition of

purchasing in construction, as suggested in section 2.1. This proposed definition contributes to a fuller and more accurate description of the current purchasing practices and processes in large construction companies in Sweden today.

In addition, it is interesting to here mention an unexpected finding for me, namely that the respondents in Paper I did not talk about trust, neither explicitly nor implicitly. Yet, in the construction management literature, trust is an important criterion for good buyer-supplier relationships (e.g. Kadefors, 2004; Laan et al., 2011; Lau and Rowlinson, 2009), and I would have expected it to come up in the interviews. One reason why trust was not mentioned could of course be that the respondents felt it was obvious, but it could also mean that trust is not quite as prominent a criterion for the relationship between construction companies and their suppliers as the literature makes it out to be. Doloj (2009), in his study of participants in the design phase, e.g. contractors, architects and consultants, showed that effective communication supersedes trust as the most important criterion for project success. For the site managers and foremen interviewed in Paper I, the suppliers' knowledge and ability to help solve situated problems were considered the most important criteria in the buyer-supplier relationship. Although communication was not explicitly mentioned as a criterion, it can be inferred that such problem solving interactions would not be possible without effective communication. Hence, the results in this thesis indicates that, from a project perspective, effective communication would appear to be more important than trust for achieving a good buyer-supplier relationship between construction companies and suppliers with framework agreements. More research is, however, warranted.

### ***5.3 Site managers' and subcontractor foremen's influence on purchasing***

As previously shown in this thesis, operational perspectives on purchasing are important to consider in order to fully understand purchasing processes and practices in large construction companies in Sweden. At the project level, a variety of subcontractors are engaged in, e.g. painting, landscaping and ventilation. This variety of specialist contractors makes the purchasing of their services rather complex. Yet limited research has been conducted in this area (Dainty et al., 2001; Hartmann and Caerteling, 2010).

Therefore, the third research question of this thesis explores the influence site managers and/or subcontractor foremen may have on the subcontractor selection process. The reason for investigating these two actors is that they carry a heavy responsibility for the project, and are each other's counterparts in the decision

making processes at this level. This research question is addressed by (1) identifying practices for achieving cooperation between site managers and subcontractor foremen in the data, (2) identifying barriers for the establishment of these practices. Note that none of the construction companies included in this study had framework agreements with the particular subcontractors studied. Based on the identified practices and barriers, I argue that implementing integrated inter-organisational project teams may be a way for construction companies to improve purchasing. These aspects are discussed below.

As shown in Paper V, three practices for achieving cooperation were identified in the buyer-supplier relationships between site manager and subcontractor foremen: (1) site managers invite subcontractors to recalculate quotations, (2) site managers request specific craftsmen from the subcontractor, and (3) subcontractors choose to only work with known and recurring buyers. In the construction management literature, the construction industry is depicted as highly competitive and adversarial (e.g. Dubois and Gadde, 2000; Pryke, 2009), and there is little mentioned of the practices for achieving cooperation in buyer-supplier relationships identified in this thesis. These nuances need to be taken into consideration in order to develop improved purchasing processes and practices that integrate both strategic thinking and already existing fruitful operational practices. Moreover, in this literature, price focus is seen as the cause of adversarialism during selection of subcontractors. For example, Hartmann and Caerteling (2010:356) through their choice experiment showed that price is the principle criterion for the selection of subcontractors, and not until a subcontractor has offered a quotation which matches those of competitors do other criteria such as cooperation, quality and technical know-how become of interest. The results in Paper V empirically support these researchers' findings.

As discussed in Paper V, the findings show that there is organisational pressure on the site managers to select the subcontractors with the lowest prices. These site managers needed to show their superiors that the subcontractor they selected actually had the lowest price, otherwise this selection of subcontractor might not have been approved. The state of affairs exemplified here induces site managers to interfere in the pricing by giving their preferred subcontractor the possibility to re-quote their price so that it will become the lowest. One of the site managers stated that "the subcontractor which you [the site manager] know will do a good job [...], they can get a chance to quote a lower price in order to distinguish themselves from the competitors". Hence, even though price focus remains the principal criterion from the organisational perspective, Papers IV and V show how price focus may be played to the advantage of the project. I therefore argue

that site managers and subcontractor foremen deploy strategies by means of which they can ensure that the inter-organisational project team will run smoothly with as few disturbances as possible during the entire project. By highlighting the adversarial nature and neglecting to account for different practices for achieving local cooperation, the construction management literature presents a limited picture of the buyer-supplier relationships within construction, especially when concerned with purchasing of subcontractor services.

Several barriers, however, hinder the establishment of the practices for achieving cooperation between construction companies and subcontractors. Some of the barriers for long-term buyer-supplier relationships mentioned in the construction management literature are perception of unequal benefits between buyer and supplier (Dainty et al., 2001), low entry barriers for subcontractors (Humphreys et al., 2003) and the reluctance of construction clients toward long-term relationships between construction companies and subcontractors (Beach et al., 2005; Briscoe and Dainty, 2005). The most prominent barrier identified in this thesis is the late appointment and involvement of a site manager as this precludes him/her from becoming engaged in the purchasing of subcontractor services. The reasons for late appointing are for instance that the construction company submits tenders for several projects simultaneously, of which only a few are then awarded to them; that the projects are initiated shortly after they are awarded to the construction company; or that, due to special circumstances, a site manager has to be relocated.

Of the six interviewed site managers in Papers IV and V, three were appointed early enough and were actively involved in purchasing in their current projects. A fourth was appointed early enough but, due to time constraints, chose not to take part in the purchasing of subcontractor services. Those who were appointed late had no possibility of influencing the selection of subcontractors. Consequently, while the site managers point out the importance of selecting preferred subcontractors, the late appointment of the site manager hinders this involvement. If site managers are to be able to influence purchasing, this barrier needs to be dealt with. The involvement of site managers as well as of subcontractors in the early phases of construction projects has previously been identified as a facilitator for subcontractor cooperation and efficient processes (Eriksson et al., 2007). Consequently, early involvement of site managers, i.e. before the purchasing of subcontractors' services, could facilitate project cooperation, leading to smoother delivery and decreased risk of problems, even though practical conditions, as mentioned earlier, might still be difficult to surmount. It should be noted that the practical conditions may vary due to type of



project, as for instance whether the project is developed in-house or not, or whether it is a civil engineering or a multi-dwelling housing project. The relationship between the type of project and practices for achieving cooperation is therefore an interesting area for further research.

By appointing site managers early on in the project, their knowledge and prior experience of subcontractor services may be used to form preferred inter-organisational project teams. The forming of preferred inter-organisational project teams has previously been suggested in the literature as a means to improve the relationships between buyers and suppliers in construction companies (e.g. Welling and Kamann, 2001). Other suggestions for improved buyer-supplier relationships are better communication and information exchange (Briscoe and Dainty, 2005) and systematic approaches to purchasing of subcontractors' services (Humphreys et al., 2003). These suggested approaches are aimed at the project level and the operational perspective on purchasing. A characteristic of construction is that, at the project level, individuals from different construction companies and subcontractors tend to have worked together at some time or other (Bröchner et al., 2002). This factor could be leveraged during purchasing in order to, as recommended by Welling and Kamann (2001), match specific individuals in project teams so as to stimulate relationships between construction companies and their subcontractors. This may, however, only be achieved if the site managers are involved early on in the project, and are sanctioned by the organisation to influence the purchasing of subcontractor services.



## **6 Implications for construction and research**

The aim of this thesis has been two-fold: (1) to explore purchasing processes and practices in large Swedish construction companies regarding organisation of purchasing and buyer-supplier relationships, and (2) to suggest ways of improving purchasing. The thesis is based on two studies: a two-year case study of one large Swedish construction company and an interview study of site managers and their subcontractors' foremen in three large Swedish construction companies. Drawing on the results of this thesis, implications for construction companies and for research have been formulated.

### ***6.1 Implications for large construction companies***

For large construction companies to improve purchasing processes and practices, these need to strengthen the integration between the purchasing department and the projects. This thesis has shown that shifting from a parallel mode of purchasing, where similar purchasing efforts are performed both in the projects and in the purchasing department, to a mediating mode where purchasing department and projects collaborate and create a common approach towards the suppliers is a viable approach for achieving this integration. Through integration between purchasing departments and projects, consideration of the strategic perspective of purchasing is facilitated without forgetting or neglecting the operational perspectives of the various construction projects. This integration between strategic and operational perspectives is essential for large construction companies that want to rationalise and improve purchasing processes and practices.

In order to reduce duplication of work by purchasing departments and projects, large construction companies need to achieve commonality of purchasing practice. These purchasing practices need to be accepted and disseminated throughout all functions of the companies. Cross-functional teams as well as a systematic approach to purchasing are possible ways of achieving such accepted practises. Also, clear priorities that are independent of the level of integration of purchasing within the organisation are needed. When commonality of practice between buyer and supplier is accepted by both projects and purchasing department, a unified interface between buyer and supplier may be established, with the result that the suppliers will face a united buyer instead of different practices in the purchasing department and in the projects. Further, as shown in this thesis, internal integration (i.e. integration between the purchasing department and the projects), is a prerequisite for reaping the potential benefits

of external integration, through e.g. more efficient processes and reduced costs in buyer-supplier relationships.

Furthermore, in terms of operational purchasing processes, site managers benefitted when they were able to continue working with previously successful inter-organisational project teams. The prevailing organisational price focus of construction companies hampers well-working processes between construction companies and subcontractors as well as the development and refinement of efficient processes. Since a low price from the subcontractor does not necessarily lead to low costs and efficient processes, the purchasing of subcontractor services needs to focus on building high performing inter-organisational project teams rather than merely focusing on decreasing subcontractor prices. This thesis has shown that practices for achieving cooperation already exist. However, this cooperation needs to be leveraged, and the formation of these preferred inter-organisational project teams needs to be facilitated by top management.

This thesis shows that the late appointment of site managers is the main barrier to the formation of preferred inter-organisational project teams. Projects therefore need more influence over the formation of relationships between construction companies and subcontractors, and the development of such relationships needs to originate from the projects. To ensure that the strategic perspective is not forgotten and to facilitate this development of relationships, top management support as well as clear and accepted purchasing practices and processes is needed. Additionally, since the preferred inter-organisational project teams are formed by the site manager, he/she needs to be appointed and become involved early on in the project, i.e. before any purchasing decisions are made. Even though the appointment and involvement of the site manager is dependent on several factors, such as type of contract and project as well as late award of projects by the construction clients, this appointment and involvement is shown to be important and needs to be facilitated.

The focus of this thesis on the operational purchasing processes between buyer and supplier highlights the need to consider operational perspectives in addition to strategic perspectives when defining and describing purchasing in construction companies. Since the performance of projects depends on the relationships at project level, long-term firm-based contracts and framework agreements between construction companies and subcontractors could be counter-productive when only the strategic perspectives of purchasing in construction are considered. Fostering operational processes between buyer and supplier at the project level, and ensuring that top management supports the development of these purchasing

processes and practices can improve purchasing in large construction companies in Sweden.

Additionally, a new definition of purchasing in construction is suggested. Based on the aforementioned need to consider both operational and strategic perspectives in purchasing processes and practices and also integrating these perspectives to take advantages of potential synergies, the suggested definition is:

*Purchasing is the management of a construction company's external resources in terms of goods, services, capabilities and knowledge, based on both long-term and short-term perspectives, in order to enable the running, maintaining and managing of the construction company's projects and support activities while integrating the project perspective and the company perspective.*

This development of purchasing processes and practices should be the responsibility of the construction companies. Nevertheless, as seen in previous research, construction clients are often reluctant to the development of relationships between construction companies and their suppliers. Hence, as the development of these relationships impacts the cost, quality and the smoothness of the processes in construction projects, construction clients need to understand their potential role as facilitators rather than inhibitors in the development of these purchasing processes and practices.

## **6.2 Implications for further research**

The research presented in this thesis has identified avenues for further studies.

A wider study of organisation of purchasing in large Swedish construction companies is called for. As this thesis is based on a case study of one large construction company and an interview study of three large construction companies, an interesting way to further explore organisation of the purchasing function would be to collect data from a wider range of companies. Through a questionnaire survey, insights regarding organisational modes and levels of integration could be gained. The survey could be either national, or it could be international and compare the Swedish purchasing situation with that in Nordic, European and other countries. An international survey would be an interesting expansion since the purchasing markets for construction companies are becoming globalised and more international collaborations between construction companies are seen in Sweden, especially when large infrastructure projects are concerned. Such a survey would contribute to an interesting analysis of the situation of

purchasing practices within construction companies both in Sweden and internationally.

Furthermore, in-depth studies of the inter-organisational project teams that are currently experiencing “good” relationships would be an interesting avenue for further research. Through in-depth interviews and observations of purchasing practices and processes, knowledge would be gained on how these relationships are formed, why they are formed and what practices are carried out between the site managers and subcontractor foremen when forming project teams. Moreover, the organisational prerequisites required to develop these teams would be a worthwhile avenue to include. This type of study would further develop understanding of the practices for achieving cooperation identified in this thesis and also of the potential benefits of such cooperation.

The findings in this thesis also indicate that much is to be learned from studying the relationships between subcontractors and their suppliers, i.e. by studying the extended supply chain. Indications of how the logic in these relationships differs from the logic of the relationships between construction companies and subcontractors have been seen. Rather than between construction companies and subcontractors, previous experiences between individuals seem to play a more important role in the selection of suppliers between subcontractors and their suppliers. This could be further investigated through studies of the purchasing processes and practices of subcontractors. This is an interesting avenue for further research to better understand purchasing processes and practices in the Swedish construction industry.

## References

- Akintoye, A., McIntosh, G. and Fitzgerald, E. (2000) A survey of supply chain collaboration and management in the UK construction industry. *European Journal of Purchasing & Supply Management*, 6 (3-4), 159-168.
- Aljian, G. W. (1984) *Purchasing Handbook*, New York: McGraw-Hill.
- Anderson, J. and Narus, J. (1991) Partnering as a Focused Market Strategy. *California Management Review*, 33 (3), 95-113.
- Arditi, D. and Chotibhongs, R. (2005) Issues in Subcontracting Practice. *Journal of Construction Engineering and Management*, 131 (8), 866-876.
- Axelsson, B. (2005) From buying to supply management at Nordic Construction Company (NCC). In: Axelsson B, Rozemeijer F and Wynstra F (eds) *Developing sourcing capabilities: creating strategic change in purchasing and supply management*. Chichester: John Wiley and Sons.
- Bankvall, L., Bygballe, L. E., Dubois, A. and Jahre, M. (2010) Interdependence in supply chains and projects in construction. *Supply Chain Management: An International Journal*, 15 (5), 385-393.
- Beach, R., Webster, M. and Campbell, K. M. (2005) An evaluation of partnership development in the construction industry. *International Journal of Project Management*, 23 (8), 611-621.
- Bemelmans, J., Voordijk, H. and Vos, B. (2012) Supplier-contractor collaboration in the construction industry A taxonomic approach to the literature of the 2000-2009 decade. *Engineering, Construction and Architectural Management*, 19 (4), 342-368.
- Benton, W. C. and McHenry, L. (2010) *Construction Purchasing and Supply Chain Management*, New York: McGraw-Hill.
- Blois, K. (1998) Don't all firms have relationships? *Journal of Business & Industrial Marketing*, 13 (3), 256-270.
- Bocconcelli, R. and Håkansson, H. (2008) External integration as a mean of making changes in a company: The role of purchasing in a major turnaround for Ducati. *The IMP journal*, 2 (2), 25-37.
- Briscoe, G. and Dainty, A. (2005) Construction supply chain integration: An elusive goal? *Supply Chain Management*, 10 (4), 319-326.
- Bryman, A. and Bell, E. (2007) *Business Research Methods*, New York: Oxford University Press.
- Bröchner, J., Josephson, P.-E. and Kadefors, A. (2002) Swedish construction culture, management and collaborative quality practice. *Building Research & Information*, 30 (6), 392-400.

- Bygballe, L. E., Håkansson, H. and Jahre, M. (2013) A critical discussion of models for conceptualizing the economic logic of construction. *Construction Management and Economics*, 31 (2), 104-118.
- Byggkommissionen. (2002) Skärpning gubbar! - Om konkurrensen, kvaliteten, kostnaderna och kompetensen i byggsektorn. *SOU 2002:115*. Stockholm.
- Carr, A. S. and Pearson, J. N. (1999) Strategically managed buyer-supplier relationships and performance outcomes. *Journal of Operations Management*, 17 (5), 497-519.
- Carr, A. S. and Smeltzer, L. R. (1997) An empirically based operational definition of strategic purchasing. *European Journal of Purchasing & Supply Management*, 3 (4), 199-207.
- Carter, J. R. and Narasimhan, R. (1996) Is purchasing really strategic? *International Journal of Purchasing and Materials Management*, 32 (1), 20-28.
- Cox, A. (2001) The Power Perspective in Procurement and Supply Management. *Journal of Supply Chain Management*, 37 (2), 4-7.
- Cox, A. and Ireland, P. (2002) Managing construction supply chains: the common sense approach. *Engineering, Construction and Architectural Management*, 9 (5), 409-418.
- Cox, A. and Thompson, I. (1997) 'Fit for purpose' contractual relations: determining a theoretical framework for construction projects. *European Journal of Purchasing & Supply Management*, 3 (3), 127-135.
- Dainty, A. (2008) Methodological pluralism in construction management research In: Knight A and Ruddock L (eds) *Advanced Research Methods in the Built Environment*. Chichester, Wiley-Blackwell.
- Dainty, A. R. J., Millett, S. J. and Briscoe, G. H. (2001) New perspectives on construction supply chain integration. *Supply Chain Management: An International Journal*, 6 (4), 163 - 173.
- Doloi, H. (2009) Relational partnerships: the importance of communication, trust and confidence and joint risk management in achieving project success. *Construction Management and Economics*, 27 (11), 1099-1109.
- Dubois, A. and Gadde, L.-E. (2000) Supply strategy and network effects - purchasing behaviour in the construction industry. *European Journal of Purchasing & Supply Management*, 6 (3-4), 207-215.
- Dubois, A. and Gadde, L.-E. (2002) The construction industry as a loosely coupled system: implications for productivity and innovation. *Construction Management and Economics*, 20 (7), 621 - 631.



- Dubois, A. and Wynstra, F. (2005) Organising the purchasing function as an interface between internal and external networks. *Proceedings of the 21st Annual IMP Conference*. 0-11.
- Dyer, W. G., Jr. and Wilkins, A. L. (1991) Better Stories, Not Better Constructs, to Generate Better Theory: A Rejoinder to Eisenhardt. *The Academy of Management Review*, 16 (3), 613-619.
- Eccles, R. G. (1981) The quasifirm in the construction industry. *Journal of Economic Behavior and Organization*, 2 (4), 335-357.
- Egan, J. (1998) Rethinking Construction: Report of the Construction Task Force. London: Department of the Environment, Transports and the Regions.
- Eisenhardt, K. M. (1989) Building Theories from Case Study Research. *The Academy of Management Review*, 14 (4), 532-550.
- Ellegaard, C. and Koch, C. (2012) The effects of low internal integration between purchasing and operations on suppliers' resource mobilization. *Journal of Purchasing and Supply Management*, 18 (3), 148-158.
- Ellegaard, C. and Koch, C. (2014) A Model of Functional Integration och Conflict - the Case of Purchasing-Production in a Construction Company. *International Journal of Operations & Production Management*, 34 (3), 325-346.
- Ellram, L. M. (1995) Partnering pitfalls and success factors. *International Journal of Purchasing and Materials Management*, 31 (2), 35-44.
- Eom, C. S. J., Yun, S. H. and Paek, J. H. (2008) Subcontractor Evaluation and Management Framework for Strategic Partnering. *Journal of Construction Engineering and Management*, 134 (11), 842-851.
- Eriksson, P. E., Dickinson, M. and Khalfan, M. M. A. (2007) The influence of partnering and procurement on subcontractor involvement and innovation. *Facilities*, 25 (5), 203-214.
- Errasti, A., Beach, R., Oyarbide, A. and Santos, J. (2007) A process for developing partnerships with subcontractors in the construction industry: An empirical study. *International Journal of Project Management*, 25 (3), 250-256.
- Fabbe-Costes, N. and Jahre, M. (2007) Supply chain integration improves performance: the Emperor's new suit? *International Journal of Physical Distribution & Logistics Management*, 37 (10), 835-855.
- Fearne, A. and Fowler, N. (2006) Efficiency versus effectiveness in construction supply chains: the dangers of "lean" thinking in isolation. *Supply Chain Management: An International Journal*, 11 (4), 283-287.
- Fearon, H. E. and Leenders, M. R. (1995) *Purchasing's Organizational Role and Responsibilities*, Phoenix: Center for Advanced Purchasing Studies.

- Fernie, S. and Thorpe, A. (2007) Exploring change in construction: supply chain management. *Engineering, Construction and Architectural Management*, 14 (4), 319 - 333.
- Frödell, M. (2009) *Contractor-Supplier Relations in a Large Contractor Organisation*. Licentiate thesis, Division of Construction Management. Gothenburg: Chalmers University of Technology.
- Frödell, M. (2011) Criteria for achieving efficient contractor-supplier relations. *Engineering, Construction and Architectural Management*, 18 (4), 381-393.
- Frödell, M. and Josephson, P.-E. (2008) Initiating Supplier Development through Value Stream Analysis: The Case of Skanska Sweden and its Largest Supplier. *Proceedings of CIB W65/55 Commissions: Transformation through Construction*. Dubai, UAE, 1-10.
- Frödell, M. and Josephson, P.-E. (2012) Reproduction of exchange relationships: Changing focus from organisations to individuals. *Proceedings of CIB 2012 Management of Construction: Research to Practice*. Montreal, Canada, 661-672.
- Frödell, M., Josephson, P.-E. and Koch, C. (2013) Integration barriers for purchasing organisation in a large construction company: towards requisite disintegration. *The IMP journal*, 7 (1), 46-58.
- Gadde, L.-E. and Dubois, A. (2010) Partnering in the construction industry-- Problems and opportunities. *Journal of Purchasing and Supply Management*, 16 (4), 254-263.
- Gadde, L.-E., Håkansson, H. and Persson, G. (2010) *Supply Network Strategies*, Chichester: Wiley.
- Gadde, L.-E. and Snehota, I. (2000) Making the Most of Supplier Relationships. *Industrial Marketing Management*, 29 (4), 305-316.
- Gadde, L. E. and Dubois, A. (2012) Partnering med leverantörer - en outnyttjad möjlighet. Stockholm, Sweden: Sveriges Byggindustrier.
- Gann, D. M. (1996) Construction as a manufacturing process? Similarities and differences between industrialized housing and car production in Japan. *Construction Management and Economics*, 14 (5), 437-450.
- Gann, D. M. and Salter, A. J. (2000) Innovation in project-based, service-enhanced firms: the construction of complex products and systems. *Research Policy*, 29 (7-8), 955-972.
- Gluch, P. and Räisänen, C. (2012) What tensions obstruct an alignment between project and environmental management practices? *Engineering, Construction and Architectural Management*, 19 (2), 127-140.

- Gold, R. (1958) Roles in sociological field observations. *Social Forces*, 36 (3), 217-223.
- Gosling, J., Purvis, L. and Naim, M. M. (2010) Supply chain flexibility as a determinant of supplier selection. *International Journal of Production Economics*, 128 (1), 11-21.
- Green, S. D., Fernie, S. and Weller, S. (2005) Making sense of supply chain management: a comparative study of aerospace and construction. *Construction Management and Economics*, 23 (6), 579 - 593.
- Harland, C. (1996a) International comparisons of supply-chain relationships. *Logistics Information Management*, 9 (4), 35-38.
- Harland, C. M. (1996b) Supply chain management: Relationships, chains and networks. *British Journal of Management*, 7 (1 SI), S63-S80.
- Hartmann, A. and Caerteling, J. (2010) Subcontractor procurement in construction: the interplay of price and trust. *Supply Chain Management: An International Journal*, 15 (5), 354-362.
- Hartmann, E., Kerkfeld, D. and Henke, M. (2012) Top and bottom line relevance of purchasing and supply management. *Journal of Purchasing and Supply Management*, 18 (1), 22-34.
- Hatmoko, J. U. D. and Scott, S. (2010) Simulating the impact of supply chain management practice on the performance of medium-sized building projects. *Construction Management and Economics*, 28 (1), 35-49.
- Hessel, I. (2014) *Organising Purchasing and Supply Management Across Company Boundaries*. PhD thesis, Institutionen för teknikens ekonomi och organisation, Industriell marknadsföring, Chalmers tekniska högskola.
- Hillebrand, B. and Biemans, W. G. (2003) The relationship between internal and external cooperation: literature review and propositions. *Journal of Business Research*, 56 (9), 735-743.
- Holmen, E., Pedersen, A.-C. and Jansen, N. (2007) Supply network initiatives – a means to reorganise the supply base? *Journal of Business & Industrial Marketing*, 22 (3), 178-186.
- Humphreys, P., Matthews, J. and Kumaraswamy, M. (2003) Pre-construction project partnering: from adversarial to collaborative relationships. *Supply Chain Management: An International Journal*, 8 (2), 166-178.
- Håkansson, H. (1982) *International marketing and purchasing of industrial goods: An interaction approach*: Wiley Chichester.
- Josephson, P.-E., Polesie, P. and Frödell, M. (2009) Understanding resources waste reduction priorities in Swedish construction. *CIB Joint*

- International Symposium 2009: Construction Facing Worldwide Challenges*. Dubrovnik, Croatia.
- Josephson, P.-E. and Saukkoriipi, L. (2007) Waste in construction projects – call for a new approach. *The Centre for Management of the Built Environment (CMB)*. Gothenburg: Chalmers University of Technology.
- Kadefors, A. (2004) Trust in project relationships—inside the black box. *International Journal of Project Management*, 22 (3), 175-182.
- Kamann, D.-J. F., Snijders, C., Tazelaar, F. and Welling, D. T. (2006) The ties that bind: Buyer-supplier relations in the construction industry. *Journal of Purchasing and Supply Management*, 12 (1), 28-38.
- Karjalainen, K. (2009) Challenges of purchasing centralization – empirical evidence from public procurement. Helsinki: Helsinki School of Economics.
- Koch, C. (2011) New Industrialisation in Supply - Balancing project configuration and long term stability through partnerships. *Final report Erabuild project*. Herning: Institute for Business and Technology, Aarhus University.
- Kraljic, P. (1983) Purchasing must become supply management. *Harvard Business Review*, 61 (5), 109-117.
- Krause, D. R. (1997) Supplier Development: Current Practices and Outcomes. *Journal of Purchasing and Materials Management*, 33 (2), 12-19.
- Krause, D. R. (1999) The antecedents of buying firms' efforts to improve suppliers. *Journal of Operations Management*, 17 (2), 205-224.
- Laan, A., Noorderhaven, N., Voordijk, H. and Dewulf, G. (2011) Building trust in construction partnering projects: An exploratory case-study. *Journal of Purchasing and Supply Management*, 17 (2), 98-108.
- Laryea, S. and Lubbock, A. (2014) Tender Pricing Environment of Subcontractors in the United Kingdom. *Journal of Construction Engineering and Management*, 140 (1), 040130291-0401302912.
- Lau, E. and Rowlinson, S. (2009) Interpersonal trust and inter-firm trust in construction projects. *Construction Management and Economics*, 27 (6), 539-554.
- Martinsuo, M. and Ahola, T. (2010) Supplier integration in complex delivery projects: Comparison between different buyer–supplier relationships. *International Journal of Project Management*, 28 (2), 107-116.
- Merriam, S. (2009) *Qualitative Research: A Guide to Design and Implementation*, San Francisco: John Wiley and Sons.
- Monczka, R., Handfield, R., Giunipero, L. and Patterson, J. (2009) *Purchasing and Supply Chain Management*, Mason, USA: South-Western.

- Monczka, R. M., Petersen, K. J., Handfield, R. B. and Ragatz, G. L. (1998) Success factors in strategic supplier alliances: The buying company perspective. *Decision Sciences*, 29 (3), 553-577.
- NCC. (2013) Annual Report 2012.
- Nordin, F., Öberg, C., Kollberg, B. and Nord, T. (2010) Building a new supply chain position: an exploratory study of companies in the timber housing industry. *Construction Management and Economics*, 28 (10), 1071-1083.
- Paulraj, A., Chen, I. J. and Flynn, J. (2006) Levels of strategic purchasing: Impact on supply integration and performance. *Journal of Purchasing and Supply Management*, 12 (3), 107-122.
- Peab. (2012) Annual Report 2011.
- Polesie, P. (2010) What do managers mean by saying "I appreciate the freedom on site". *Proceedings of CIB 2010 World Congress*. Salford Quays, UK.
- Polesie, P., Frödell, M. and Josephson, P.-E. (2009) Implementing standardisation in medium-sized construction firms: facilitating site managers feeling of freedom through bottom-up approach. *Proceedings for the 17th Annual Conference of the International Group for Lean Construction*. Taiwan, 317-326.
- Pooler, V. H., Pooler, D. J. and Farney, S. D. (2004) *Global purchasing and supply management: Fulfill the vision*: Springer.
- Porter, M. E. (1985) *Competitive advantage: creating and sustaining superior performance*, New York: Free Press.
- Proverbs, D. G. and Holt, G. D. (2000) Reducing construction costs: European best practice supply chain implications. *European Journal of Purchasing & Supply Management*, 6 (3-4), 149-158.
- Pryke, S. (2009) *Construction Supply Chain Management: Concepts and Case Studies*. Chichester: Blackwell Publishing.
- Rozemeijer, F. (2000) How to manage corporate purchasing synergy in a decentralised company? Towards design rules for managing and organising purchasing synergy in decentralised companies. *European Journal of Purchasing & Supply Management*, 6 (1), 5-12.
- Rozemeijer, F. and Wynstra, F. (2005) Organizing for strategic sourcing. In: Axelsson B, Rozemeijer F and Wynstra F (eds) *Developing sourcing capabilities: creating strategic change in purchasing and supply management*. Chichester: John Wiley and Sons.
- Ryu, I., So, S. and Koo, C. (2009) The role of partnership in supply chain performance. *Industrial Management & Data Systems*, 109 (4), 496-514.
- Saad, M., Jones, M. and James, P. (2002) A review of the progress towards the adoption of supply chain management (SCM) relationships in

- construction. *European Journal of Purchasing & Supply Management*, 8 (3), 173-183.
- Sako, M. (1992) *Prices, quality and trust: Inter-firm relations in Britain and Japan*, Cambridge: Cambridge University Press.
- Samuelsson, P. (2006) *Integrated Measurement and Assessment of Performance in Large Organizations: The Case of a Swedish Construction Company*. PhD thesis, Building Economics and Management. Göteborg: Chalmers University of Technology.
- Sánchez-Rodríguez, C., Hemsworth, D. and Martínez-Lorente, Á. R. (2005) The effect of supplier development initiatives on purchasing performance: a structural model. *Supply Chain Management: An International Journal*, 10 (4), 289 - 301.
- Schneider, L. and Wallenburg, C. M. (2013) 50 Years of research on organizing the purchasing function: Do we need any more? *Journal of Purchasing and Supply Management*, 19 (3), 144-164.
- Silverman, D. (2005) *Doing Qualitative Research: A Practical Handbook*, London: Sage Publications.
- Skanska. (2012) Annual Report 2011.
- SNI. (2007) Swedish Standard Industrial Classification 2007.
- Statistics Sweden. (2013) Basfakta företag enligt Företagens ekonomi efter näringgren SNI 2007. År 2000-2011. Latest update 2013-05-06 ed.
- Statskontoret. (2009) Sega gubbar? En uppföljning av Byggkommissionens betänkande "Skärpning gubbar". Stockholm: SOU 2009:6.
- Sydow, J., Lindkvist, L. and DeFillippi, R. (2004) Project-Based Organizations, Embeddedness and Repositories of Knowledge: Editorial. *Organization Studies*, 25 (9), 1475-1489.
- The Commission of the European Communities. (2003) Commission recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises. Official Journal of the European Union, 2003/361/EC.
- Thiry, M. and Deguire, M. (2007) Recent developments in project-based organisations. *International Journal of Project Management*, 25 (7), 649-658.
- Thompson, I., Cox, A. and Anderson, L. (1998) Contracting strategies for the project environment. *European Journal of Purchasing & Supply Management*, 4 (1), 31-41.
- Van Der Vaart, T. and Van Donk, D. P. (2008) A critical review of survey-based research in supply chain integration. *International Journal of Production Economics*, 111 (1), 42-55.

- van Weele, A. (2005) *Purchasing & Supply Chain Management: Analysis, Strategy, Planning and Practice*, London: Thomson.
- Welling, D. T. and Kamann, D.-J. F. (2001) Vertical Cooperation in the Construction Industry: Size Does Matter. *Journal of Supply Chain Management*, 37 (4), 28-33.
- Williamson, O. E. (1981) The Economics of Organization: The Transaction Cost Approach. *American Journal of Sociology*, 87 (3), 548-577.
- Winch, G. M. (2001) Governing the project process: a conceptual framework. *Construction Management and Economics*, 19 (8), 799-808.
- Winch, G. M. (2010) *Managing Construction Projects: An Information Processing Approach*, West Sussex, UK: Wiley-Blackwell
- Yin, R. K. (2009) *Case study research: design and methods*, London: Sage Publications.
- Zhao, X., Huo, B., Selen, W. and Yeung, J. H. Y. (2011) The impact of internal integration and relationship commitment on external integration. *Journal of Operations Management*, 29 (1-2), 17-32.