Logistics performance management in textiles supply chains: best practice and barriers

Abstract

Purpose of this paper
The textiles industry is characterized by complex supply chains, unpredictable demand and being less developed in terms of logistics. The purpose of the paper is to explore and assess to what extent textiles supply chains display the best practices and barriers to logistics performance management that exist across supply chains in general.

Design/methodology/approach

The method is a multiple case study of two textiles supply chains with a special focus on the rarely-addressed interface between the manufacturer and the retail chain. The retail chains represent one large, global retail chain and one Nordic, comparably smaller retail chain. This paper is primarily empirical and describes practices for logistics performance management. The analysis discusses and explains best practices and barriers for logistics performance managements in textiles supply chains.

Findings

No textiles industry-specific patterns were found; consequently, we can say that textiles supply chains display generic best practices and barriers to logistics performance management. Some interesting findings, however, included the best practice of exchanging action plans between the actors, which enable improvement projects even across large geographical distances. One barrier found was the differences in selecting metrics and setting targets within the same supply chain actor.

Research limitations/implications
The theoretical contribution is that the best practices and barriers in the home and interior decoration part of the comparably less-researched textiles industry appear to conform to the generic ones apparent across other industries and sectors. This is an interesting finding, implying that general solutions theory also can be applied in this industry.

Practical implications

One practical contribution can be found in the descriptions based upon real case settings, which can provide managerial insights, be utilized for benchmarking purposes and indicate improvement potentials.

Originality/value
Textiles supply chains—starting at a manufacturer and ending in a retail chain—seem to be an unchartered territory and not many studies have been previously performed. We question industry differences and offer some insights related to context.

Keywords: *performance management, supply chains, textiles industry, best practice, barriers*

1. Introduction

To meet the demands of today's dynamic business environment, collaboration and access to performance information of supply chain partners are important (Ferreira *et al.*, 2012). Performance management implies that a number of activities, from strategy via measurement towards performance improvement actions, are viewed as a whole (Forslund and Jonsson, 2007; Papakiriakopoulos and Pramatari, 2010; Ferreira *et al.*, 2012). Performance measures can be internal or external, financial or non-financial, and can also be process measures (Kaplan and Norton, 1992; Papakiriakopoulos and Pramatari, 2010). Logistics refers to the effective and efficient management of material flows within and between companies. In this paper the order-to-delivery process is primarily studied. The management of logistics performance in the order-to-delivery process—for example, lead times, delivery precision, and environmental effects—is important for the effectiveness of a supply chain (Amato and Amato, 2009; ECR, 2011; Randall *et al.*, 2011). Measuring logistics performance moves the focus from strategic, financial performance on a managerial level to operational performance enabled by information sharing between customers and suppliers (Papakiriakopoulos and Pramatari, 2010).

Logistics performance management has previously been described in theory in different sectors. A number of studies have been carried out within and between companies in the manufacturing sector (e.g. Bourne *et al.*, 2002; Schmitz and Platts, 2004; Forslund and Jonsson, 2007; 2010; Ferreira *et al.*, 2012) and among logistics service providers (van Hoek, 2001; Liu *et al.,* 2010; Forslund, 2012). For the retail sector, the knowledge on aspects of logistics performance management is more fragmented. Wiese *et al.* (2012) claimed a time lag of more than ten years in retail performance research as compared to manufacturing. In studies among retail supply chain executives, performance management was pointed out as one key issue for future competitiveness (ECR, 2011; Randall *et al.,* 2011). Logistics performance management is seldom studied between manufacturers and retail chains. Hamister (2011) stressed the importance of addressing both manufacturers and retailers, as they have expertise in different domains and the combination can create unique knowledge.

Ferreira *et al.* (2012) made another contextual division and studied performance management in SMEs, indicating that company size matters. Papakiriakopoulos and Pramatari (2010) indicated that performance management practices differ between contexts and settings. Amato and Amato (2009) mentioned cross-industrial differences within the retail sector, and also differences between actors in retail supply chains. Industries may have their own specific characteristics. The textiles industry, addressed in this study, is highly competitive (Dotti *et al.*, 2012) and logistics problems such as long lead times and unpredictable demand prevail (Unahabhokha *et al*., 2007; Kwok and Wu, 2009). Few studies on logistics performance management in this industry have been identified. Unahabhokha *et al*. (2007) described how a predictive performance measurement system could improve low delivery performance of one textiles manufacturer. Dotti *et al.* (2012) studied a yarns and fabric manufacturer, where the company-internal performance measurement system had to be flexible to handle frequent re-design of production processes. Textiles supply chains are often design-driven (Chan and Chan, 2010), which puts extra demand on logistics performance. The fashion retail chain Zara is often described as being particularly successful in managing logistics performance such as lead time in their supply chain (e.g. Morgan, 2007).

Busi and Bititci (2006), Papakiriakopoulos and Pramatari (2010), and Ferreira *et al.* (2012) argue a need for extended, collaborative performance measurement systems along the interfaces of supply chains, something that Dotti *et al.* (2012) agreed with specifically for

supply chains in the textiles industry. As there is a limited knowledge on logistics performance management practices covering both the textiles manufacturer and the retail chain, it seems relevant to provide such descriptions. It is not clear whether generic practices also apply to textiles supply chains specifically. Descriptions can bring value to industry practitioners as well as complementing the current knowledge of performance management. The identification of good solutions or best practices can furthermore expand the knowledge on logistics performance management from other industries and sectors. Previous studies, mainly from the manufacturing sector, have identified, for example, common and agreed-upon performance metrics (Forslund and Jonsson, 2007) as a best practice. In the retail sector automatic performance data capturing and reporting have been identified (Papakiriakopoulos and Pramatari, 2010). As descriptions are scarce, limited knowledge exists on whether these best practices also are found in textiles supply chains. To what extent do textiles supply chains display the best practices for logistics performance management that exist across supply chains in general?

Research has also identified generic barriers to performance management in supply chains. Barriers are perceived causes to lower-functioning performance management. Lack of trust and lack of IT support (Brewer and Speh, 2001; Forslund and Jonsson, 2009) are examples of known barriers for performance management in supply chains. If we believe there are differences in practices between industries (e.g. Amato and Amato, 2009), we would also believe that there are differences in the associated barriers between industries, as indicated by Papakiriakopoulos and Pramatari (2010). No identified study has described barriers to logistics performance management in textiles supply chains. What barriers do companies in textiles supply chains face, and to what extent do textiles supply chains display the barriers to logistics performance management that are evident across supply chains in general? Understanding barriers seems to be a first step towards handling those barriers. This could be important for the studied companies and bring insights to other companies.

The purpose of this paper is to explore and assess to what extent textiles supply chains display the best practices and barriers to logistics performance management that exist across supply chains in general. The intended theoretical contribution is for logistics performance management literature, suggesting that the type of industry may make a difference.

The remainder of this paper is organized as follows: a literature review is conducted and presented. After the methodology section, two textiles supply chains and their performance management processes are described. The analysis compares performance management practices in textiles supply chains and identifies their best practices and barriers, together with a discussion on the findings. Finally, conclusions and ideas for future research are presented.

2. Literature review

A literature review was conducted to structure the empirical material and to frame the analysis. It is divided into three sections. In section 2.1, performance measurement is introduced broadly. Section 2.2 contains a review on the performance management process, along with its best practices and barriers. The textiles industry is described in section 2.3.

2.1 Performance measurement

Performance measurement is the process of quantifying the effectiveness and efficiency of actions (Neely *et al.*, 1995). Any company would strive to enhance revenue, control costs, increase asset utilization and improve customer satisfaction. In supply chains the emphasis is on how well a chain or group of companies performs in these terms, in order to create value for the final customer (Brewer and Speh, 2001).

There are several performance measurement frameworks in a supply chain. One framework is the balanced scorecard (Kaplan and Norton, 1992), which contains the measurement of both financial and non-financial performance. It balances internal and external performance and links performance metrics to processes. It was adapted to a supply chain environment by Brewer and Speh (2001). Another framework is the Supply Chain Operation Reference (SCOR) model. Based on five standard supply chain processes—plan, source, make, deliver and return—a terminology and a framework of standard process performance metrics was developed (Lockamy and McGormack, 2004). The SCOR model describes supply chains in five dimensions, namely, reliability, responsiveness, flexibility, cost and efficiency in asset utilization (Stephens, 2001). A third framework is provided by Krajewski *et al.* (2007), which distinguishes between inventory measures, process measures and financial measures.

2.2 The logistics performance management process

The entire process: Even if a growing amount of studies with frameworks, recommendations and metrics were available, the practical problem of implementation and use remains. Emphasis is put on metrics rather than the accompanying measurement framework (Neely *et al.*, 1995; Holmberg, 2000; Ferreira *et al.*, 2012). A performance management process encourages companies to improve their performance (Ferreira *et al.*, 2012) and widens the scope from metrics and measurement towards management. It implies that a number of activities, from strategy to improvement actions, are viewed as a whole (e.g. Busi and Bititci, 2006; Forslund and Jonsson, 2007; Papakiriakopoulos and Pramatari, 2010; Ferreira *et al.*, 2012). The development from performance measurement to management was identified as an important trend by, e.g., Busi and Bititci (2006).

Papakiriakopoulos and Pramatari (2010) found integrated business processes to be a key enabling factor for collaborative performance measurement. Collaboration, a best practice in the performance management process, can mean to jointly agree upon and conduct each of the respective activities between customer and supplier (Forslund and Jonsson, 2007). Another type of collaboration is suggested by Ferreira *et al.* (2012), who mention that one powerful supply chain partner often controls the collaborative performance management while the other partner follows, which can be referred to as a hierarchical type of collaboration. Forslund and Jonsson (2007) described a situation where one supplier handles the entire performance management process and the buyer accepts and follows it. Collaboration as a best practice is also suggested by, e.g., Busi and Bititci (2006) and Dotti *et al.* (2012).

Barriers can also be related to the entire process. Brewer and Speh (2001) in particular pointed out difficulties in developing a collaborative culture as an implementation problem for performance management in supply chains. This is also supported by Holmberg (2000), Bourne *et al.* (2002), Busi and Bititci (2006) and Papakiriakopoulos and Pramatari (2010). Lack of trust has been identified as another implementation problem or barrier by Brewer and Speh (2001) and Forslund and Jonsson (2009). The latter study found a lack of trust to be the single most hindering factor for collaborative performance management. A third barrier in the practical use of performance management as a whole is lack of understanding and knowledge (Brewer and Speh, 2001; Busi and Bititci, 2006).

Ferreira *et al.* (2012) suggest a performance management process consisting of three levels. The first level identifies the strategy and vision, while the second consists of execution and monitoring. Finally, the third level analyzes the output or outcomes. Neely *et al.* (1995) provided a structure in three elements: individual measures, a set of measures to capture performance as a whole and a supporting infrastructure, including the acquisition, sorting, analysis, interpretation and dissemination of measurement data. Simatupang and Shidharan (2003) suggested a four-step collaborative performance management process, consisting of 1)

design, 2) the utilization of a common IT system, 3) incentives and 4) intensifying and maintaining performance. Another structure of building collaborative performance management consists of data management, business process management and collaboration (Papakiriakopoulos and Pramatari, 2010).

The framework of Forslund and Jonsson (2007, 2010) is more detailed. It contains five activities and furthermore it is specifically developed for logistics performance management. Therefore, the description of the performance management process is based on the structure of this framework, although complemented by several other authors. The activities in this process are: selecting metrics, defining metrics, setting targets, measuring, and analyzing/acting.

Selecting metrics: Selecting metrics involves concretizing strategic choices and visions (Kaplan and Norton, 1992; Lohman *et al.,* 2004). This is also supported by Ferreira *et al.* (2012) who claim that "*implementing various performance indicators and measures and setting targets reflect the strategic goals and objectives of an organization*" (p. 683). In a supply chain, it is important that the actors discuss and agree on what logistics performance metrics to apply (Forslund and Jonsson, 2010). Related to selecting metrics, Brewer and Speh (2001) found barriers in the shape of differing goals and objectives when supply chain partners select metrics, and difficulties in linking metrics to customer value. Lohman *et al.* (2004) reported difficulty and uncertainty in selecting metrics, and Bourne *et al.* (2002) related problems in finding meaningful metrics to the failure of performance measurement implementation. Ferreira *et al.* (2012) found that collaborative partners used different metrics.

The performance metrics can be internal as well as external (Papakiriakopoulos and Pramatari, 2010). The key performance indicator (KPI) is a variable that measures a performance factor quantitatively and represents the overall performance of an organization or supply chain (Ferreira et al., 2012). The SCOR model contains defined performance metrics such as delivery performance, order fulfilment lead times and cash-to-cash cycle, which allow for performance measurement across the supply chain (Stevens, 2001). Krajewski *et al.* (2007) suggested inventory measures such as inventory value, weeks of supply and inventory turnover. Process measures are related to customer relationship, order fulfilment and supplier relationship processes and could include customer satisfaction, on-time delivery or lead times. Financial measures could be return on assets or cost of goods sold.

Forslund and Jonsson (2007; 2010) showed that delivery precision is a dominant logistics metric among manufacturing companies. Delivery precision and lead time were identified as important metrics for a textile manufacturer in the study by Unahabhokha *et al.* (2007). Dotti *et al*. (2012) provided a "performance box" for a textiles manufacturer with multidimensional metrics (cost, quality, time and productivity). Theodoras *et al.* (2005) identified the following logistics metrics as important between supplier and retailer: service level, complete orders, delivery of products without defects, efficient handling of returns, information about shortages in the orders, delivery precision and efficient handling of emergency orders. One development in retail supply chains is the acknowledgement of environmental performance variables, such as reduced packaging and alternative fuels (Fernie *et al.*, 2010). Ferreira *et al.* (2012) claim that the number of KPIs depends on the available data structure or on the complexity of the measurement process. Unahabhokha *et al.* (2007) and Papakiriakopoulos and Pramatari (2010) mentioned the importance of limiting the number of performance metrics. The opposite conclusion was delivered by Neely *et al.* (1995), who proposed that metrics should incorporate different perspectives, which may lead to a large number of metrics.

Defining metrics: Studies on performance management seldom include the definition or calculation of each performance metric (Papakiriakopoulos and Pramatari, 2010), which is an important link between the metric and accessible data. Bourne *et al.* (2002) concluded that companies, characterized as successful in performance management, understood the importance of using validated and sufficiently specified metrics definitions. Ferreira *et al.* (2012) stress the need for defining all applied metrics, and metrics definitions are especially critical in a supply chain context, as more than one actor should be able to use the metric. With discrepancies between the actors' definitions, all remaining activities are hampered. Lohman *et al.* (2004) suggested a detailed "metrics dictionary" to ensure common and shared metrics definitions in a supply chain as, like other performance factors, KPI varies in meaning according to stakeholder type (Ferreira *et al.*, 2012). Forslund (2010) found a lack of IT support for different metrics definitions.

In order to define logistics metrics such as on-time delivery, service level and lead-time, detailed aspects must be agreed upon by the supply chain partners. One is the measurement object, whether it is the order, order line, unit/product or value (Unahabhokha *et al.,* 2007). The second is the time unit, whether it is a week, day, hour, or some kind of delivery window. A third aspect is the measurement point, or where along the supply chain a measurement takes place; e.g., delivered from the supplier, accessible to the customer, or at the point of consumption. The fourth is the comparison, whether it is the customer's wished or the acknowledged demand that is compared (Forslund and Jonsson, 2007). For service level, one definition can be the percentage of available stock on every product to satisfy the retailer's demand (Theodoras *et al.*, 2005).

Setting targets: Targets are often based upon the supplier's subjective interpretation of the customer's needs. To avoid this and to make targets reflect real needs they should be set in a joint manner (Holmberg, 2000; Ferreira *et al.*, 2012). Performance target figures can be formulated as averages—i.e., the same target level for all customers or suppliers—or as specific targets—i.e., unique targets for specific customers or suppliers. Average figures are consequently not set jointly (Forslund and Jonsson, 2007). Wang *et al.* (2008) discussed the importance of setting specific and differentiated performance targets. Soltani *et al.* (2004) reported different problems with setting targets, e.g., missing targets, vague targets or inconsistency between targets.

Brewer and Speh (2001) and Forslund and Jonsson (2009) found differing goals and objectives when supply chain partners select different target levels for the same metric. Wang *et al.* (2008) mentioned the lack of conceptual frameworks to handle differentiated targets for different distribution channels or supply chains. Dotti *et al*. (2012) provided targets for each metric in the performance box developed for a textiles manufacturer.

Measuring: In measuring, it is recommended that the supply chain partners agree on who should measure, how often, with which methods and how to communicate the reports or outcomes of the measuring. This is described in detail for one specific textiles manufacturer focusing on delivery precision in a study by Unahabhokha *et al.* (2007). Data capturing of performance data was often conducted manually in manufacturing companies (Forslund and Jonsson, 2007; 2010), whereas Papakiriakopoulos and Pramatari (2010) note that retailers often have good data-capturing capabilities through access to point-of-sales (POS) data. Measurements can be made with different measurement frequencies, for example, daily, weekly or monthly. The measurement frequency restricts the frequency of conducting analysis. The performance figures could, in a similar way as for target figures, be either average for all customers or suppliers, or specific for certain customers or suppliers. Performance feedback could be given from customer to supplier and/or from supplier to customer, to be commented on, adjusted, or accepted, in order to assure common agreement

on actual performance outcome before starting the next activity, analysis. Another issue to study is how much manual work is required to report measurement data. Measurement reports generation could be done with more (for example, via Excel) or less (directly from the transaction system) manual work. Finally the communication of measurement data could be more (e.g. via a web portal) or less (e.g. via telephone or in meetings) integrated with the supplier (Forslund and Jonsson, 2007; 2010).

Papakiriakopoulos and Pramatari (2010) suggested providing measurement outcomes daily or weekly in a web-based measurement portal. Forslund and Jonsson (2010) showed that those customer-supplier dyads that had automatic, and thereby high-frequency measurement reports, perceived higher logistics performance levels than those dyads that had manual and low-frequency measurement reports. Hence good or integrated IT support is a best practice in measuring.

Analysing/acting: A properly conducted measurement activity is consequently a prerequisite for conducting analysis. The analysis should be input to corporate or supply chain-related continuous improvement projects and proactive decision making, as well as monitoring and following up past performance for making reactive decisions (Ferreira *et al.,* 2012; Dotti *et al.,* 2012). Collaborative analysis is a critical success factor for improved performance (Papakiriakopoulos and Pramatari, 2010; Ferreira *et al.*, 2012). Forslund and Jonsson (2010) showed that those customer-supplier dyads which had shared analysis and improvement actions showed higher logistics performance levels than those dyads that did not. Collaboration in the analysis activity depends on the extent of supply chain perspective in the continuous improvement. Different approaches could be to let the customer improve at the customer's plant, let the customer and supplier improve together, let the supplier improve at the supplier's plant, or undertake customer-initiated improvements at the supplier's plant (Forslund and Jonsson, 2010).

Forslund and Jonsson (2007) showed that analysing and acting were weakly-performed activities in the performance management process between manufacturing companies, mainly related to differences between the partners in the defining metrics activity. Menachof *et al.* (2009) found that the internationalisation of retail chains has led to performance improvements, where less developed logistics systems have been forced up to an international standard performance level.

Along with the literature review, a number of best practices and barriers for logistics performance management in supply chains are identified. Most studies are presented as generic in terms of which industries, sectors and contexts they represent. They are shown in Table 1.

Table 1. Best practice and barriers to logistics performance management

	Best practice (reference)	**Barriers (reference)**
The entire process	Collaboration (Busi and Bititci, 2006; Dotti *et al*., 2012; Ferreira *et al.*, 2012)	Difficulties in developing a collaborative culture (Holmberg, 2000; Brewer and Speh, 2001, Bourne *et al.*, 2002; Busi and Bititci, 2006) Lack of trust (Brewer and Speh, 2001; Forslund and Jonsson, 2009) Lack of understanding (Brewer and Speh, 2001; Busi and Bititci, 2006)
Selecting metrics	Agreed metrics (Forslund and Jonsson, 2010) Limited number of metrics (Unahabhokha *et al.* 2007; Papakiriakopoulos and Pramatari, 2010)	Differing metrics (Brewer and Speh, 2001; Bourne *et al.*, 2002; Ferreira *et al.*, 2012) Difficulties in finding meaningful metrics/linked to customer value (Brewer and Speh, 2001; Bourne *et al.*, 2002; Lohman *et al.,* 2004)
Defining metrics	Metrics dictionaries/validated metrics (Bourne *et al.*, 2002; Lohman *et al.*, 2004)	Lack of metrics definitions (Papakiriakopoulos and Pramatari, 2010) Lack of IT support for different metrics definitions (Forslund, 2010)
Setting targets	Shared and specific targets (Holmberg, 2000; Wang *et al.*, 2005; Ferreira *et al.*, 2012)	Inconsistent or subjective targets (Holmberg, 2000; Soltani *et al.* (2004) Differing target levels (Brewer and Speh, 2001; Forslund and Jonsson, 2009)
Measuring	Good/integrated IT support for data capturing and reporting (Busi and Bititci, 2006; Papakiriako-poulos and Pramatari, 2010) Frequent exchange of measurement outcome (Forslund and Jonsson, 2010; Papakiriako-poulos and Pramatari, 2010)	Lack of IT support for data capturing and reporting (Bourne *et al.*, 2002; Lohman *et al.*, 2004)
Analyzing/ acting	Collaborative analysis/ improvement actions (Dotti *et al*., 2012; Ferreira *et al.*, 2012)	Weak analysis due to differing metrics definitions (Forslund and Jonsson, 2007)

The textiles industry

The textiles industry is highly diverse and heterogeneous. The European textiles industry can be divided into three end market categories: clothing and fashion, home and interior decoration, and a broad range of technical uses including transport, construction, healthcare and furniture (Euratex, 2012). The industry can also be viewed in terms of the type of companies it consists of, ranging from chemical conglomerates producing dyes, detergents and artificial fibers, to healthcare companies producing bandages and other products, to niche design-driven fashion companies (Bruce *et al*., 2004).

The textiles industry tends to be dominated by large and powerful retailers, whilst the majority of the textiles manufacturing companies are small and medium sized with a limited amount of power. The retailers tend to deal with manufacturers with centralized buying who exert considerable pressure on prices, quality and delivery terms (Bruce *et al.*, 2004). The supply chains in the textiles industry are often complex and relatively long, with a number of supply chain actors involved. In the traditional textiles industry, supply chain actors face global competition where fibers may be produced in one country, spun into yarns, woven into fabrics, and confectioned in other countries, before being sold in a different part of the world (Abernathy *et al.*, 1999; Kwok and Wu, 2009). Problems such as long transportation distances, long lead times, short product life cycles, high product variety, unpredictable demand (Bruce *et al.*, 2004; Unahabhokha *et al.*, 2007; Kwok and Wu, 2009; Chaudry and Hodge, 2012) and low profit margins are common in the textiles industry (Bruce *et al.*, 2004). Kwok and Wu (2009) further emphasize the textiles industry as being less developed in terms of logistics. A high speed of change characterizes the industry (Dotti *et al.*, 2012). Fast fashion textiles items are increasing their share as consumers expect variety and changes in design (Chan and Chan, 2010). Time then becomes an important factor for achieving a competitive advantage. Traditional purchasing based on long-term forecasts implies high risk, and it is difficult to make a good forecast. One way to handle this is by Quick Response strategies, where an important aim is to shorten the lead times and to reduce inventory levels in the supply chain (Forza and Vinelli, 1997).

3. Methodology

For exploratory purposes, a case study approach is often appropriate (Yin, 2014). Even though a growing amount of studies with frameworks, recommendations and metrics are available, the practical problems with implementation and use remain. More empirical case studies are therefore needed to extract further knowledge (Lohman *et al.*, 2004; Papakiriakopoulos and Pramatari, 2010). According to Papakiriakopoulos and Pramatari (2010), case studies are furthermore a good consolidation tool between theory and practice. A case study approach was consequently selected for this paper.

Clearly defining the study object in supply chain performance measurement studies is encouraged by Barratt *et al.* (2011). The study object in this study is textiles supply chains, starting with a manufacturer and ending in retail stores, with the focal point being the seldom-researched interface between the textiles manufacturer and the sourcing organizations of the retail chain. Each supply chain consists of one manufacturer and at least one sourcing organization. A multiple case study of two textiles supply chains was carried out. Having a limited number of cases enables a deep and detailed study (Barratt *et al.*, 2011). Due to good access to two supply chains in home and interior decoration (Euratex, 2012), we decided to proceed with these. The two cases represent one large global supply chain and one Nordic, comparably smaller supply chain, based on retail chain turnover. Both retail chains are among the market leaders in Sweden. The case companies were selected based upon their similar

business models, with design in-house and their own or franchised retail stores. The suppliers are located in the same country in south-eastern Europe, while the central sourcing organizations are Swedish. Both are focused on the same home textile product. Consequently, the supply chains have a lot in common. This gives us a good position for concluding whether and how industry does matter.

It is not obvious which respondent to address when it comes to performance management. Respondents with knowledge and responsibility in logistics performance management were sought for broadly. More than one respondent per company was often needed to get the entire picture. The global supply chain had many persons in different functions involved, while the Nordic chain had logistics performance management centralized to just one person in each organization. Eleven respondents in total were selected. The studied companies and respondents are shown in Table 2.

Table 2. Studied companies and respondents

Supply chain	**Company/actor**	**Respondents**
The global supply chain	Textiles manufacturer	Customer representative 1, customer representative 2, quality manager
	Local sourcing of retail chain	Business developer, senior replenishment planner, replenishment planner
	Central sourcing of retail chain	Global business developer, senior global supply planner, global supply planner
The Nordic supply chain	Textiles manufacturer	Sales manager
	Sourcing of retail chain	Logistics and purchasing manager

The data collection followed the procedures recommended by Yin (2014), such as basing interview questions on the literature review, providing definitions, and letting each respondent validate their case description in order to increase validity. For specific questions where clarification was needed, additional interviews were carried out to verify and also specify the responses. All respondents were interviewed, and the supply chain actors were interviewed on separate occasions, in order to prevent each respondent from being affected by having the other supply chain actors present. Semi-structured personal interviews lasting between 60 and 90 minutes were carried out. Both textiles manufacturers were interviewed in Sweden. To increase reliability, multiple respondents were interviewed when possible, in order to enable source triangulation (Barratt *et al.,* 2011). Other data sources complemented the interviews, such as documents and measurement reports (method triangulation, Yin, 2014). Altogether this implies that the empirical study possesses satisfying validity and reliability.

The analysis is of a cross-case character and uses a pattern matching approach (Yin, 2014). It combines previous knowledge from the textiles industry and logistics performance management knowledge, in order to fulfil the purpose. As the results did not display the expected industry differences, we also discuss possible explanations for this.

4. Two textiles supply chains

This chapter is divided in two main sections: 4.1 presents the global supply chain, and 4.2 examines the Nordic supply chain. A special emphasis is placed on the relation or interface between the manufacturer and the sourcing organization of each retail chain. For each chain, descriptions of the respective supply chains' actors, relations and products are first given. Then the order-to-delivery process is presented in order to understand the context of logistics performance management. Finally, the logistics performance management practices are presented for the performance management process.

4.1 The global supply chain

Supply chain actors, relations and products

This textiles manufacturer is vertically integrated and production includes spinning yarn, weaving fabric, printing, dyeing and confectioning. The global retail chain sources textiles products and sells them under their own brand.

The global retail chain has two types of sourcing organizations: one global sourcing organization in the company headquarters and local sourcing organizations in different sourcing regions. The central sourcing organization has the strategic view of all business relations with textiles manufactures worldwide, and also works with global forecasting. The local sourcing organizations focus on operational and tactical questions related to all textiles manufacturers within their respective sourcing areas. The set up between sourcing organizations and the textiles manufacturer is illustrated in Figure 1.

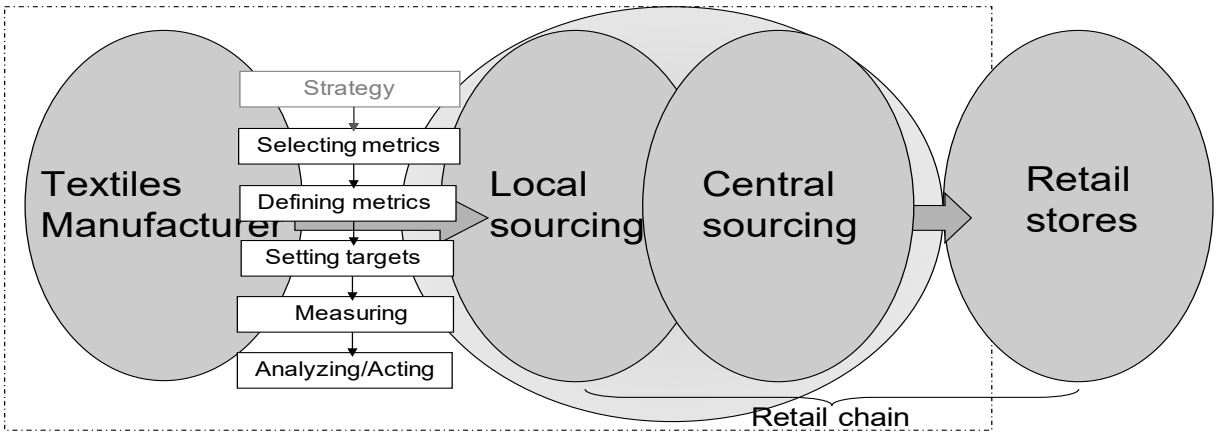

Figure 1. The actors in the global supply chain

The relationship between the companies is long-standing, and both textiles manufacturer and sourcing organizations perceive the relationship as important, strategic, and long-term. The retail chain is the textiles manufacturer's primary customer, and they have a specifically educated team working with the retail chain. The manufacturer is more dependent on the retail chain than vice versa. The location of the textiles manufacturer, close to the main selling markets, is perceived as a competitive advantage in relation to the predominately Asian suppliers.

The global retail chain has a wide range of home decoration products and purchases approximately 140 items from the textiles manufacturer. The item types are also sourced from other suppliers in other sourcing areas. The products range from basic products with a long product life cycle to more design-driven products with shorter life cycles. Most items, however, have a life cycle of more than six months.

The order-to-delivery process

The retail chain shares long-term requirements of 52 weeks, on an item number/week level, and aggregated sales forecast for 52 weeks with the textiles manufacturer via a web portal. Orders are sent weekly via EDI, with a four-week order lead time. The textiles manufacturer produces towards the customer order, but keeps some stock for the retail chain in the form of semi-finished and finished goods. Under normal circumstances, the placement of an order initiates weaving, printing/dyeing and confectioning. Deliveries are made one or two times per week. The textiles manufacturer is responsible for loading, after which the retail chain takes over the responsibility for the goods. The retail chain arranges and pays for the freight (FCA).

The performance management process

The entire process: The actors show a lot of collaboration, exemplified in, e.g., the IT solutions in the relationship. They show good knowledge of each other's processes and the sourcing organizations express trust in the textiles manufacturer.

Selecting metrics: The textiles manufacturer has a number of internal metrics, environmental effects, capacity utilization and external metrics, such as order quantities and wished delivery dates. They also recognize the KPIs selected by the retail chain.

The retail chain works with two types of metrics: KPIs, which are the same for all suppliers; and local, more specific metrics. The retail chain's KPIs have an external focus, measuring the textiles manufacturers as well as the availability in retail stores. The KPIs are: service level, delivery precision of the textiles manufacturer, cancellation rate, and lead time deviation. Central sourcing also measures landed cost (including cost of transportation and the amount of capital that is tied up) and follows the plan accuracy (correspondence between planned and actual orders), but has no measurement for the manufacturer's flexibility. The local sourcing organization follows all KPIs while central sourcing focuses primarily on the service level. Local sourcing also measures the flexibility of the textiles manufacturer and they follow the plan accuracy as well as fill rate in trucks or containers.

Defining metrics: The global retail chain has written definitions for the KPIs, stating what, when and how the KPIs are measured. This information is shared with the textiles manufacturer. For service level, the measurement object is "available in store". The measurement object for delivery precision is order value, the measuring point is "loaded at textiles manufacturer" and the time unit is +/-1 day for deviation. Comparison is delivery date according to order. Early deliveries are registered as "on time".

For cancellation rate the measuring object is order value. The measurement object for lead time deviation is the difference between planned dispatch date on consignment level and the original plan date. The deviation is based on order value. The measuring object for planned orders vs. actual orders is units and the comparison is planned order four weeks into the future (outside the delivery lead time), vs. the actual order. Flexibility is, according to local sourcing, measured based on the above plan accuracy on a unit level, based on the manufacturer's ability to deliver despite deviations. Fill rate is measured in percent of the total volume of the load carrier.

Setting targets: The targets for service level in the global retail chain are, depending on the turnover of the item, set to 99, 97, 95 or 90%. The supplier has items in all service level classifications. The central target for delivery precision is 95%, and the target for cancellations is a maximum of 5%. The local sourcing organization sets higher targets (95+) for delivery precision for the textiles manufacturers they work with. Lead time deviation is followed but no target value is set. The target for fill rate is 60%. The textiles manufacturer acknowledges the targets set by the retail chain and uses them as their own.

Measuring: Measurement data is captured automatically and both the textiles manufacturer and sourcing organizations feel that they have good reporting tools. The data for only one metric is collected and managed manually—the flexibility metric used by local sourcing. It shows how well the supplier can perform in relation to order fluctuations. As an example, during the last month, the fluctuations in orders have been up to +300% on an item level, and the supplier's delivery precision towards actual orders has been more than 90%. Both the manufacturer and the sourcing organizations currently reach the targets for their metrics. Reports for the KPIs are created monthly.

Analyzing/acting: The manufacturer gets monthly feedback regarding their KPI performance from local sourcing, hence analysis is provided by the other actor. Local sourcing analyses the KPI reports on a monthly basis and they also follow the day-to-day performance of the textiles manufacturer. Central sourcing follows and analyses the KPIs with a focus on service level. Improvement work is initiated if KPIs are deviating from target. Improvement work is also initiated if any of the supply chain partners perceive an improvement potential in any area. The improvement potentials can come from the benchmarks of other textiles manufacturers. The initiator of the improvement work varies between the three actors; the question of which supply chain actors will be involved in the improvement work also varies. It can be the manufacturer only, the manufacturer and local sourcing, or a joint project team between the manufacturer, local sourcing and central sourcing. If the textiles manufacturer is deviating from target for the KPIs they always communicate an action plan to local sourcing to ensure that they can reach the targets the next month.

The latest improvement project was a joint project for fill rate. There was no perceived problem with the fill rate from the textiles manufacturer, as the central goal of 60% was reached. However, as a result of a benchmarking activity towards another textiles manufacturer of the same range, an improvement potential was identified. The fill rate is now 75–78% as a result of small changes in the packaging instructions of the items as well as working with a third layer in the containers.

4.2 The Nordic supply chain

Supply chain actors, relations and products

The textiles manufacturer dyes and confections textile products. The sourcing organization of the Nordic retail chain is located in their Swedish headquarters. They handle both strategic and operational sourcing with suppliers. The products are delivered to Nordic stores, both owned and franchised. The supply chain is illustrated in Figure 2.

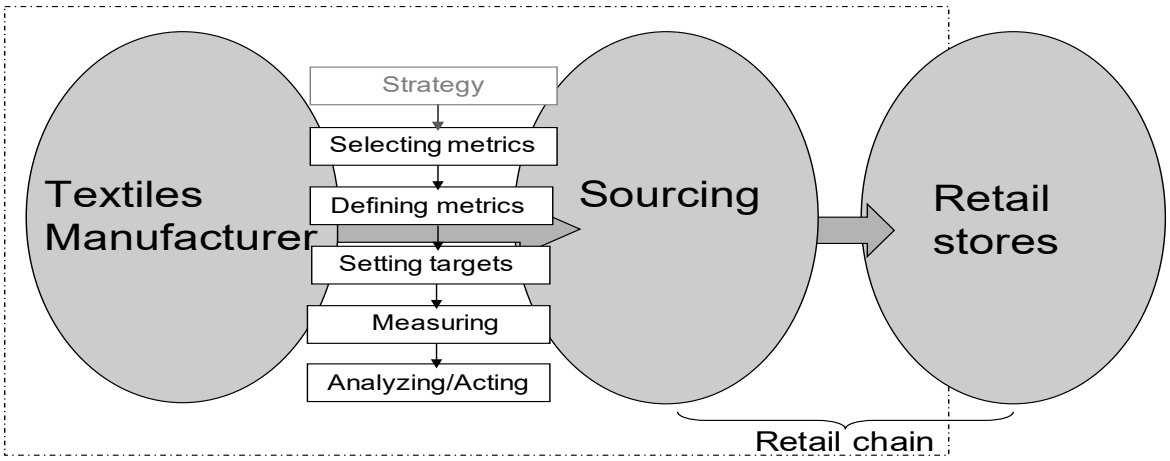

Figure 2. The actors in the Nordic supply chain

The textiles manufacturer is a strategic partner supplier for the retail chain. The retail chain is one of four key account customers of the textiles manufacturer. The manufacturer is more dependent on the Nordic retail chain than vice versa. The relationship is long-term on a company, but not a personal, basis.

This chain sources 150 items from the textiles manufacturer, branded with the retail chain's own brand. The products range from basic products with a long product life cycle, to more design-driven products with shorter life cycles.

The order-to-delivery process

In the order process, aggregated six-months' forecasts (defined as capacity/volume based on historical sales) are transmitted to the manufacturer by email. Grey fabric (not yet dyed a particular colour) is sourced based on this forecast. Orders are transmitted to the manufacturer via e-mail on a monthly basis. The manufacturer cuts, dyes and stitches the products to order. The lead-time from placement of the order by the Nordic retail chain to shipping is four weeks. The retail chain purchases FOB, which implies that the manufacturer arranges the road transport to the domestic port. One container is shipped every four weeks; this vessel leaves every Friday so a missed delivery is delayed one week. The container is transported by road to the distribution centre and then to the stores. The actors do not have a strong knowledge about each other's business processes.

The performance management process

The entire process: Purchasers have been changed frequently over time with little-planned successions, therefore little trust is built up in the relationship. Little personal communication takes place between the manufacturer and sourcing in the Nordic retail chain as most communication is conducted by email. This indicates a low level of collaboration, expressed by both actors.

The textiles manufacturer does not have good knowledge about the retail chain's performance management process. The Nordic retail chain's sourcing has good knowledge in performance management and logistics.

Selecting metrics: The manufacturer focuses on cost, inventory levels and container fill rate internally. Delivery precision is expressed to be very important as related to the delivery process, but no formal measurement is currently taking place. Flexibility is also something

that the textiles manufacturer “lives”, but they cannot measure it either. Environmental issues are important to them, as reflected in their ÖKOTEX certification, but they are not measured.

The sourcing of the Nordic retail chain uses the following metrics for both the textiles manufacturer and the stores: lead-time, delivery precision and damages. Flexibility is said to be important but no metric exists. Internally, the focus is on distribution costs, inventory levels and turnover plus CO_2 emissions as shown in the sustainability report. One shared metric that is a focus for both actors is delivery precision. Top management has shifted performance priorities and lately, financial performance has become more of a focus.

Defining metrics: The manufacturer has the following definition of delivery precision: the measurement object is each order, which is assessed as correct if the order volume is met +/-5%. The measurement point is accessible for delivery with truck to the port. The time unit is days, however there is also a weekly logic as the vessel leaves every Friday. The comparison is made against what is acknowledged to the customer.

The retail chain defines the delivery precision as follows: the measurement object is order line and the measurement point is accessible for delivery. The time unit is a window of +/-1 week for the manufacturer to handle the shipping frequency. The comparison is made against the acknowledged number of order lines. This implies that the actors define the central metric with a number of differences (in measurement object, time unit and comparison).

Setting targets: The target for delivery precision for the manufacturer is 100%.

The demand on logistics performance is high, and is expressed by the sourcing of the retail chain, and not based on the demand from stores. Sourcing in the Nordic retail chain has an 80% delivery precision target for the textiles manufacturer, which is deliberately not communicated to the manufacturer in order to prevent lowering of the textiles manufacturer’s ambitions to deliver with high delivery precision.

Measuring: The manufacturer conducts no data capturing or measurement; the retail chain’s orders are preventively and manually prioritized, flagged and chased through the production. No performance feedback is received from the retail chain, and no performance feedback is given to the retail chain. The perceived outcome is 100% delivery precision over a long time.

Manual data capturing is applied by the retail chain, but barcodes are successively implemented. Sourcing in the retail chain has very good IT support for the performance management process. They create internal monthly reporting out of the ERP system, which has to be complemented with the use of Excel. The perceived outcome for delivery precision is, on average, 78% from the textiles manufacturer. Over the months, this outcome ranges from 20 to 100%. The manufacturer is said to get performance feedback with measurement reports when needed.

Analyzing/acting: Due to the perceived high delivery precision performance level, currently little analysis or action takes place within the manufacturer; they are very confident with their performance. Overall, very little communication is taking place between the actors.

The retail chain does conduct internal analysis and action when needed, but does not complete such actions together with the manufacturer.

5. Analysis and discussion

Logistics performance management best practices in textiles supply chains are analyzed in section 5.1. In 5.2, barriers are identified and related to the barriers to logistics performance management that exist across supply chains in general. In 5.3, a discussion is presented. The

cross-case analysis is hampered by the differences found between the cases, where best practices mainly are found in the global supply chain.

5.1 Logistics performance management best practices

The entire process: The logistics performance management process in the global supply chain is perceived as well-functioning and collaborative. One sign of this is the well-developed and integrated IT support. The process is, however, controlled by the global retail chain. As demonstrated by Ferreira *et al.* (2012), this can be seen as hierarchical collaboration. Collaboration can be found in the entire process, but it can also be found in the context of the performance management process, in line with Papakiriakopoulos and Pramatari (2010) and Ferreira *et al.* (2012). We therefore add a level of best practices in Table 3.

Building on the proposal of Papakiriakopoulos and Pramatari (2010), we propose that the business process is one contextual variable. We have only studied the order-to-delivery process, which in the global supply chain operates with much higher frequency in both material and information flow, which supports the design-driven industry with short product life cycles (Chan and Chan, 2010). We also see considerable differences in the IT support level, where the global supply chain uses web portals and EDI, showing a highly integrated business process.

The actors in the studied supply chains agree that the retail chain is the dominant actor. The retailers' dependence on the textiles manufacturer is smaller than vice versa. This is in accordance with Bruce *et al.* (2004) and Dotti *et al.* (2012), who claim that the textiles industry is dominated by large and powerful retailers. This is the case even as the manufacturers deviate from the small- and medium-sized organizations that are typical for textiles manufacturers (Bruce *et al.*, 2004), as they belong to large groups of companies. Power correctly applied can promote collaboration in supply chain relations (Benton and Maloni, 2005).

Selecting metrics: None of the supply chains have adopted metrics frameworks such as a balanced scorecard (Kaplan and Norton, 1992) or the SCOR model (Lockamy and McGormack, 2004); however, in the Nordic supply chain, few logistics performance metrics are selected. Having few metrics is presented as a best practice by Unahabhokha *et al.* (2007) and Papakiriakopoulos and Pramatari (2010). In both supply chains, both internal and external metrics (Papakiriakopoulos and Pramatari, 2010) are found. In the global chain many metrics are agreed upon, or at least accepted. This can be seen as a best practice (Forslund and Jonsson, 2010). However, as noted by Lohman *et al.* (2004) and Ferreira *et al.* (2012) this may indicate that the metrics only reflect one actor's strategy. The Nordic supply chain has one such agreed-upon metric. Selecting delivery precision, which is done in both supply chains, is a common practice among manufacturers (Forslund and Jonsson, 2007; 2010), and was also mentioned as an important metric for textiles manufacturers by Unahabhokha *et al.* (2007). Selecting service level is expected to be more common among retailers (Theodoras *et al.*, 2005); this metric is found in the global supply chain.

Defining metrics: The textiles manufacturer in the global supply chain agrees to the metrics as defined, in the simple form of a metrics dictionary, by the global retail chain. This is in accordance with the recommendations by Bourne *et al.* (2002), Lohman *et al.* (2004), Papakiriakopoulos and Pramatari (2010) and Ferreira *et al.* (2012). In defining metrics, again we see a sign of hierarchical collaboration.

Setting targets: Specific and accepted targets for KPIs are used in the global supply chain between central sourcing and the manufacturer. This corresponds to the suggestions of

Holmberg (2000) and Wang *et al.* (2005) as a best practice. Accepting targets can also be related to the hierarchical collaboration based upon power.

Measuring: High-frequency measuring is carried out in the global supply chain with good IT support, supporting the findings of Busi and Bititci (2006) and Papakiriakopoulos and Pramatari (2010) and contrary to the findings of Forslund and Jonsson (2007; 2009). Good IT support is unlikely to be an industry practice, but more a "sign of the times", that all but one of the studied companies have caught up with the IT development and now appear to have the required tools.

Analysing/acting: Mutual feedback is taking place, leading to frequent analysis in the global supply chain. Collaborative analysis and improvement projects lead to reached targets, which corresponds to the findings of Papakiriakopoulos and Pramatari (2010), Forslund and Jonsson (2010), Ferreira *et al.* (2012) and Dotti *et al.* (2012). Overall performance management is high-frequency, and supports the high-frequency business processes well. An especially interesting best practice found in the textiles industry is the previously mentioned example of shared improvement projects on geographic distance by exchanging action plans. This best practice is marked with italic text in Table 3. It was not found in the literature review, but deserves to be spread to other companies.

Theory on best practices is mainly based on practices in the manufacturing sector (e.g. Forslund and Jonsson, 2010). Based on the discussion above, we can conclude that many of the generic best practices mainly have been identified in the global supply chain in the textiles industry. Table 3 presents the identified best practices and relates them to theory.

Table 3. Best practice in theory and in the cases

	Best practice in theory	**Best-practice in the cases**
Context		Collaboration in business processes based upon power
The entire process	Collaboration	Hierarchical collaboration
Selecting metrics	Agreed metrics Limited number of metrics	Agreed metrics Limited number of metrics
Defining metrics	Metrics dictionaries/validated metrics	Metrics dictionaries in simple form
Setting targets	Shared and specific targets	Shared and specific targets
Measuring	Good/integrated IT support for data capturing and reporting Frequent exchange of measurement outcome	Good/integrated or at least automatic data capturing and reporting Frequent exchange of measurement outcome
Analyzing	Collaborative analysis/improvement actions	Collaborative improvement actions *Sharing of action plans*

5.2 Barriers to logistics performance management

Barriers are perceived causes of lower-functioning performance management. A barrier can be seen as the opposite of a best practice, such as when collaboration is seen as a best

practice, and the difficulty of creating a collaborative culture is seen as a barrier. In addition, barriers can be related to context (Papakiriakopoulos and Pramatari, 2010), to the entire performance management process or to specific activities.

The entire process: Barriers identified in previous studies are also found in this study. In the Nordic supply chain, few signs of collaboration can be found. The actors do not display understanding (Brewer and Speh, 2001) of each other's performance management processes and they lack integrated IT support (Bourne *et al.*, 2002; Lohman *et al.*, 2004) other than email. Little personal communication is taking place. This indicates a low level of collaboration. Difficulties in developing a collaborative culture (Holmberg, 2000; Brewer and Speh, 2001; Busi and Bititci, 2006) are hence found. The low level of collaboration in the Nordic supply chain may be related to the lack of exchange and communication in the relationship as well as shifting priorities and focus from top management. In turn, it is also related to a number of other barriers; for example, that trust is not built up on a personal level (Brewer and Speh, 2001). Lack of trust is associated with less-collaborative logistics performance management, similar to the findings of Brewer and Speh (2001) and Forslund and Jonsson (2009). Barriers cause other barriers. Barriers in the context surrounding the performance management process then cause barriers in the process, and subsequently in specific activities. Barriers in a specific activity can again affect other subsequent activities in the performance management process. Managing logistics performance is a matter of finding good solutions and handling barriers. The interrelationships between barriers make it difficult to identify where to begin when barriers need to be handled.

Selecting metrics: A wide variety of logistics performance metrics are used in the global supply chain, contrary to what Unahabhokha *et al.* (2007) and Papakiriakopoulos and Pramatari (2010) recommend. It seems, however, that they manage this with their good IT support and the many persons involved. In the Nordic supply chain, few logistics performance metrics are selected. It is important to note that even though the Nordic supply chain has implemented few performance metrics, those metrics are neither agreed upon nor defined jointly, and hence all subsequent activities in the performance management process are hampered, in accordance with the proposal of Ferreira *et al*. (2012). Differing metrics can be seen between actors in the Nordic supply chain (Brewer and Speh, 2001; Ferreira *et al.*, 2012).

In the global supply chain, we can see internal differences between the sourcing organisations, hence appearing within one supply chain actor. Local sourcing has a metric for flexibility, showing how well the textiles manufacturer is performing despite the fluctuations caused by, for example, forecast errors. This metric is not supported by the global sourcing organization. We feel this is an interesting finding, presented in italics in Table 4. A plausible interpretation is that, in competition with other local sourcing organizations, the local sourcing uses its own metric (flexibility) to promote their local suppliers. The fact that the customer-focused metric service level is not applied in the Nordic supply chain may be interpreted as being due to difficulties in linking metrics to customer value (Brewer and Speh, 2001; Lohman *et al.*, 2004); however, this is not expressed by any of the actors. We still consider this to be a barrier for logistics performance management in this case.

Defining metrics: The definitions of delivery precision in the Nordic supply chain are not synched between the actors, and differ in measurement object and time unit, which was found to be a common practice by Forslund and Jonsson (2007) and also accords with the findings of Unahabhokha *et al.* (2007) and Ferreira *et al.* (2012). The limited communication that takes place between the partners is partly related to the long geographic distances that are typical in the industry (Kwok and Wu, 2009; Chaudry and Hodge, 2012).

Setting targets: In the Nordic supply chain the targets differ greatly between the partners. The Nordic retail chain's logistics manager mentions that performance targets are deliberately not discussed with the textiles manufacturer. This accords with the findings of Brewer and Speh (2001) and Forslund and Jonsson (2009), and is exactly the opposite of the recommendations made by Holmberg (2000) and Ferreira *et al.* (2012). The structure of the sourcing organization of the global retail chain implies that there is one additional interface to handle between central and local sourcing, and it is interesting to note that the global supply chain presents different targets for delivery precision between the two sourcing organizations. The global sourcing organization adheres to the KPI target, where local sourcing claims to work to reach a higher target. This has the potential to cause interpretation problems at the textiles manufacturer's end. This is another interesting finding of the study, marked with italic text in Table 4. As with the selection of metrics, this can be seen as an effect of internal competitive pressure in order to secure the competitiveness of the local textiles manufacturers. Hence both the number of supply chain interfaces and internal competition can be proposed as barriers not previously identified. The textiles industry implies complex and long supply chains with many interfaces (Abernathy *et al.*, 1999; Bruce *et al*., 2004; Kwok and Wu, 2009). Such interfaces present challenges to logistics performance management in general, and not only in the textiles industry. We propose that these barriers be classified as contextual rather than belonging to specific activities.

Measuring: The manufacturer in the Nordic supply chain has a manual measurement approach, in accordance with the findings of Forslund and Jonsson (2007; 2010), with the perceived outcome of 100% delivery precision. They do not perceive lacking IT support; the same is valid for the Nordic retail chain, contrary to the findings of Lohman *et al.* (2004) and Forslund and Jonsson (2007; 2009). The Nordic retail chain makes monthly reports and finds the manufacturer's delivery precision outcome to be significantly lower than their non-official target of 80%. One interesting note is that the IT-related barriers mentioned by Bourne *et al.* (2002) and Lohman *et al.* (2004) are not perceived. Even though it may not expressed by the respondent, we need to consider a lack of IT support to be one reason for the manual approach of the textiles manufacturer in the Nordic supply chain, which therefore is a barrier in the case.

Analyzing/acting: In the Nordic supply chain, the manufacturer perceives a 100% performance level, and perceives that no analysis is required. The retail chain conducts some internal analysis, but has not initiated any improvement actions in conjunction with the manufacturer—they do not even give feedback on performance information to the manufacturer. This is in line with the findings of Forslund and Jonsson (2007). One reason for the weak or lacking analysis is the differing metrics definitions (Forslund and Jonsson, 2007). We see here that a barrier in a precedent activity becomes a barrier in a subsequent activity. Not conducting collaborative analysis and actions can be related to lower performance levels that are also perceived by the retail chain, which accords with Forslund and Jonsson (2010).

As a summary of the discussion above, barriers identified across industries and sectors and those identified in this study of two textiles supply chains are shown in Table 4. None of these barriers are seen as being industry-specific.

Table 4. Barriers in theory and in the cases

	Barriers in theory	**Barriers in the cases**
Context		Supply chain interfaces Internal competition
The entire process	Difficulties in developing a collaborative culture Lack of trust Lack of understanding	Difficulties in developing a collaborative culture Lack of trust Lack of understanding
Selecting metrics	Differing metrics Difficulties in finding meaningful metrics/linked to customer value	Differing metrics *within and* between supply chain actors Difficulties in linking metrics to customer value
Defining metrics	Lack of metrics definitions Lack of IT support for different definitions	
Setting targets	Inconsistent or subjective targets Differing target levels	Differing target levels *within and* between supply chain actors
Measuring	Lack of IT support for data capturing and reporting	Lack of IT support for data capturing and reporting
Analyzing	Weak analysis due to differing metrics definitions	Weak analysis due to differing metrics definitions

5.3 Discussion

Even if it is acknowledged that the textiles industry is highly diverse and heterogeneous (Euratex, 2012), the sampling strategy was to select cases within one area of textiles—home and interior decoration—with a large number of similarities in order to keep many variables stable, and look for logistics performance management best practices and barriers that could be related to the industry. However, we note more differences than similarities *between* the cases. No textiles industry-specific practices in logistics performance management were found in the literature review. Neither were such practices found in the empirical study.

These unexpected results can lead us to at least two different paths. Either we conclude that it is necessary to consider a broader study of the textiles industry in order to make valid statements of industry practices, or we conclude that other factors than industry affect logistics performance management. Best practices were mainly found in the global supply chain while barriers were mainly found in the Nordic supply chain. This case shows the practices that we expected from textiles supply chains as being less developed than other industries in terms of logistics (Kwok and Wu, 2009). The large share of the company turnover from other industries in the global retail chain can act as an explanatory factor; the Nordic supply chain deals only in textiles. Menachof *et al.* (2009) found that the internationalization of retail chains has implied that less-developed logistics systems have been forced to conform to an international standard. Movement of and access to managers,

processes and IT support between industries can imply that industrial differences are of low importance.

6. Conclusion, contributions, limitations and future research

The purpose of this paper was to explore and assess to what extent textiles supply chains display the best practices and barriers to logistics performance management that exist across supply chains in general. No textiles industry-specific patterns were found; consequently we can say that textiles supply chains do display generic best practices and barriers. An interesting finding is the best practice of exchanging action plans between the supply chain actors, which enables improvement projects even across long geographical distances. One barrier not previously proposed by literature is the differences observed in selecting metrics and setting targets occurring within the same supply chain actor, which possibly can be explained by internal competition. It is also interesting to note that the previously well-known barrier of lacking IT support is not a perceived barrier by any of the respondents.

The theoretical contribution is that the best practices and barriers in the home and interior decoration parts of the comparably less-researched textiles industry appear to conform to those generic best practices and barriers apparent across industries and sectors. This is an interesting finding, implying that general solutions theory can also be applied in this industry. We also provide a discussion on some contextual factors that can explain differences in logistics performance management. A practical contribution can be found in the descriptions based upon real case settings, which can provide managerial insights, be used for benchmarking purposes and indicate improvement potentials. Other managerial implications are connected to the risk that additional internal interfaces and competition can cause differences in metrics and targets within the supply chain actor. This would be especially relevant for managers of larger companies to notice and possibly counter. As metrics should reflect strategy, it is plausible to believe that differences in metrics indicate a difference in strategy and overarching targets. We find this of high managerial value.

The study objects are supply chains, with a special focus on the interface between manufacturers and retail chains. This is a limitation, where an extension to the full supply chain could give a more comprehensive understanding. Other limitations are related to the small sample size—the cases were more heterogeneous than expected—and to the respondents—they are selected by the best of our knowledge but the descriptions are based on their perceptions. A third limitation is related to the fact that both supply chains are based in home and interior decoration/home textiles, which represent only one part of the textiles industry (Euratex, 2012).

Future research is recommended to complement this study. To be able to offer a state-of-the-art description, including confirmed best practices and barriers of textiles supply chains, a broader survey study would be required. It would also be interesting to expand the current case study's scope in order to also capture the interface between the sourcing organizations and the retail stores, to make a more retail-oriented study. However, such a study would grow very large. An additional path would be to continue the investigation of contextual factors that affect logistics performance management. Knowing more about contexts seems to be a more relevant explanation for differences than industry. Performance management with suppliers is one step in increasing the capabilities of a supplier (e.g. Mortensen and Arlbjørn, 2012), which in more extensive steps is referred to as supplier development. Continued case studies in this area would complement the understanding gained in this study.

References

Abernathy, F.H., Dunlop, J.T., Hammond, J.H. and Weil, D. (1999), *A Stitch in Time – Lean Retailing and the Transformation of Manufacturing Lessons from the Apparel and Textiles Industries*, University Press, New York.

Amato, L.H. and Amato, C.H. (2009), ”Changing retail power and performance in distribution channels”, *International Journal of Retail & Distribution Management*, Vol. 37 No. 12, pp. 1057-1076.

Barratt, M., Choi, T.Y. and Li. M. (2011), “Qualitative case studies in operations management: trends, research outcomes, and future research implications”, *Journal of Operations Management*, Vol. 29, pp. 329-342.

Benton, W.C. and Maloni, M. (2005),“The influence of power driven buyer/seller relationships on supply chain satisfaction”, *Journal of Operations Management,* Vol. 23, pp. 1-22.

Bourne, M., Neely, A., Platts, K. and Mills, J. (2002), “The success and failure of performance measurement initiatives – perceptions of participating managers”. *International Journal of Operations & Production Management*. Vol. 22 No. 11, pp. 1288-1310.

Brewer, P. and Speh, T. (2001), “Adapting the balanced scorecard to supply chain management”, *Supply Chain Management Review*, March/April, pp. 48-56.

Bruce, M., Daly L. and Towers, N., (2004), “Lean or agile: A solution for supply chain management in the textiles and clothing industry?” *International Journal of Operations & Production Management*, Vol. 24 No. 2, pp. 151 – 170.

Busi, M. and Bititci, U. (2006). “Collaborative performance management: present gaps and future research”. *International Journal of Productivity & Performance Management*, Vol. 55 No. 1, pp. 7-25.

Chan, F.T.S. and Chan, H.K. (2010), ”An AHP model for selection of suppliers in the fast changing fashion market”, *International Journal of Advanced Manufacturing Technology*, Vol. 51, pp. 1195-1207.

Chaudry, H. and Hodge, G. (2012) “Postponement and supply chain structure: cases from the textile and apparel industry”, *Journal of Fashion Marketing and Management*, Vol. 16 No. 1, pp 64-80.

Cox, A., Watson, G., Lonsdale, C. and Sanderson, J. (2004), “Managing appropriately in power regimes: relationship and performance management in 12 supply chain cases”, *Supply Chain Management: An International Journal*, Vol. 9 No. 5, pp. 357-371.

Dotti, S., Zanga, G., Gaiardelli, p. and Resta, B. (2012). ”A performance measurement system for the textile and clothing industry: the performance box”, *Annals of the University of Oradea. Fascicle of Textiles, Leatherwork,* Vol. 13 No. 1, pp. 15-22.

ECR (2011), “Optimizing your supply chain by using standards”, available at: www.ecr-all.org/ecropedia (accessed 20 April 2012).

Euratex (2012), *Position of the European textiles and clothing industry and its applied research community on support for SME Research & Innovation under HORIZON 2020*, position paper

Fernie, J., Sparks, L. and McKinnon, A. (2010), “Retail logistics in the UK: past, present

and future", *International Journal of Retail & Distribution Management*, Vol. 38 No. 11/12, pp. 353-370.

Ferreira, P.S., Shamsyzzoha, A.H.M., Toscano, T. and Cunha, P. (2012), "Framework for performance measurement and management in a collaborative business environment", *International Journal of Productivity & Performance Management*, Vol. 61 No. 6, pp. 672-690

Forslund, H. (2010), "ERP systems' capabilities for supply chain performance management", *Industrial Management & Data Systems*, Vol. 110 No. 3, pp. 351-367.

Forslund, H. (2012). Performance management in supply chains; logistics service providers' perspective. International Journal of Physical Distribution & Logistics Management, Vol. 42, No. 3, pp. 296-311.

Forslund, H. and Jonsson, P. (2007), "Dyadic integration of the performance management process: a delivery service case study", *International Journal of Physical Distribution & Logistics Management*, Vol. 37 No. 7, pp. 546-567.

Forslund. H. and Jonsson, P. (2009), "Obstacles to supply chain integration of the performance management process in customer-supplier dyads: the buyers' perspective", *International Journal of Operations & Production Management*, Vol. 29 No.1, pp. 77-95.

Forslund, H. and Jonsson, P. (2010), "Integrating the performance management process of on-time delivery with suppliers", *International Journal of Logistics; Research and Applications,* Vol. 13 No. 3, pp. 225-241.

Forza, C. and Vinelli, A. (1997), "Quick response in the textiles-apparel industry and the support of information technologies", *International Journal of Retailing & Distribution Management*, Vol. 8 No. 3, pp. 125-136.

Holmberg, S. (2000), "A systems perspective on supply chain measurement", *International Journal of Physical Distribution & Logistics Management*, Vol. 30 No. 10, pp. 847-868.

Kaplan, R.S. and Norton, D.P. (1992), "The balanced scorecard – measures that drive performance", *Harvard Business Review*, January-February, pp. 71-79.

Krajewski, L.J., Ritzman, L.P. and Malhotra, M.K. (2007). *Operations management: processes and value chains*. Pearson Education, Upper Saddle River.

Kwok, S.K. and Wu, K.K.W. (2009), "RFID-based intra-supply chain in textiles industry", *Industrial Management & Data Systems*, Vol. 109 No. 9, pp. 1166 – 1178.

Liu, X., Grant, D.B., McKinnon, A.C. and Feng, Y. (2010). "An empirical examination of the contribution of capabilities to the competitiveness of logistics service providers; a perspective from China". *International Journal of Physical Distribution & Logistics Management*, Vol. 40 No. 10, pp. 847-866.

Lockamy, A. and McCormack, K. (2004). "Linking SCOR planning practices to supply chain performance: an explorative study". *International Journal of Operations & Production Management*, Vol. 24 No. 12, pp. 1192-1218.

Lohman, C., Fortuin, L. and Wouters, M. (2004), "Designing a performance measurement system: a case study", *European Journal of Operational Research*, Vol. 156 No. 2, pp. 267-286.

Menachof, D. A., Bourlakis, M. A. and Makios, T. (2009), "Order lead-time of grocery

retailers in the UK and Greek markets", *Supply Chain Management: An International Journal*, Vol. 14 No. 5, s. 349-358.

Morgan, C. (2007), "Supply network performance measurement: future challenges?", *International Journal of Logistics Management*, Vol. 18 No. 2, pp. 255-273.

Mortensen, M., and Arlbjørn, J. (2012),"Inter-organisational supplier development: the case of customer attractiveness and strategic fit", *Supply Chain Management: An International Journal*, Vol. 17 No. 2, pp. 152 – 171.

Neely, A.D., Gregory, M.J. and Platts, K.W. (1995), "Performance measurement system design: a literature review and research agenda", *International Journal of Operations & Production Management*, Vol. 15 No. 4, pp. 80-116.

Papakiriakopoulos, D. and Pramatari, K. (2010), "Collaborative performance measurement in supply chain", *Industrial Management & Data Systems,* Vol. 110 No. 9, pp. 1297-1318.

Randall, W.S., Gibson, B.J., Defee, C.C. and Williams, B.D. (2011), "Retail supply chain management: key priorities and practices", *International Journal of Logistics Management,* Vol. 22 No. 3, pp. 390-402.

Schmitz, J. and Platts K.W. (2004), "Supplier logistics performance measurement: indications from a study in the automotive industry", *International Journal of Production Economics*, Vol. 89 No. 2, pp. 231-43.

Simatupang, T. and Shidharan, R. (2003), "The collaborative supply chain", *International Journal of Logistics Management*, Vol. 13 No. 1, pp. 15-30.

Soltani, E., van der Meer, R.B., Gennard, J. and Williams, M.T. (2004), " A study of UK-based TQM-driven organisations", *The TQM Magazine*, Vol. 16 No. 6, pp. 403 – 417.

Stephens, S. (2001). "Supply chain operations reference model version 5.0: a new tool to improve supply chain efficiency and achieve best practice", *Information Systems Frontiers*, Vol. 2 No. 4, pp. 471-476.

Theodoras, D., Laios, L. and Moschuris, S. (2005), "Improving customer service performance within a food supplier-retailers context", *International Journal of Retail & Distribution Management*, Vol. 33 No. 5, s. 353-370.

Unahabhokha, C, Platts, K and Kim Hua Tan (2008), "Predictive performance measurement system; a fuzzy expert system approach", *Benchmarking; an International Journal*, Vol. 14 No. 1, pp. 77-91.

van Hoek, R.I. (2001). "The contribution of performance measurement to the expansion of third party logistics alliances in the supply chain". *International Journal of Operations & Production Management*, Vol. 21 No. 1/2, pp. 15-29.

Wang Y., Potter A., Mason R. and Naim M. (2008), "Aligning Transport Performance Measures with Customized Retail Logistics: a Structured Method and its Application, *International Journal of Logistics: Research and Application*, Vol. 11 No. 6, pp. 457–473.

Wiese, A., Kellner, J., Lietke, B., Toporowski, W. and Zielke, S. (2012), "Sustainability in retailing –a summative content analysis", *International Journal of Retail & Distribution Management*, Vol. 40 No. 4, pp. 318-335.

Yin, R. (2014). *Case study research; design and methods.* Sage Publishing, London.