

Postponement and Logistics Flexibility in Retailing

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Abstract

This dissertation addresses several general logistics problems in retailing regarding meeting a variety of customer demand and availability, efficiency and effectiveness in carrying inventory, and increased logistics flexibility. It builds upon the well-established supply chain principle of postponement, and argues for the benefits associated with it in tackling certain logistics challenges. Classically, most of the scholarly contributions in logistics and supply chain management in relation to postponement and logistics flexibility deal with manufacturing firms. This thesis contributes to the current literature by studying the concepts in a retail context. It shows the contemporary application of postponement, and the potential benefits associated with it. It could serve as a hint for retail decision-makers on prioritizing certain logistics decisions regarding their desired performance.

The thesis aims to explore the application of postponement and logistics flexibility in retailing, and to investigate the resulting firm performance. It consists of a cover and a compilation of six articles, which serve to address three research questions. The thesis has a mixed methods design and consists of two empirical strands. The first two articles report two individually carried out systematic literature reviews on postponement and logistics flexibility, which serve as building blocks for the empirical strands. The first Strand, which consists of two empirical articles, includes qualitative case studies dealing with exploring how postponement is applied in retailing, seeking connections to logistics flexibility. Qualitative data is collected via a myriad of sources and tools. In Paper 3, data is collected on Media Markt, Jysk, and Lidl via interviews, and site visits, as well as from secondary sources on other supply chain actors, including service providers and product suppliers. Paper 4, explores a manifestation of postponement – customization – in upscale bicycle retailing in the nexus of retailers and consumers. It is built on qualitative data collected via interviews and netnography. The second Strand consists of two quantitative articles based on a cross-sectional survey of retailers in Sweden. Paper 5, which is of exploratory nature, deals with simplifying the complexities associated with logistics practices of retailers, and intends to provide a taxonomy of logistics configurations resulting from postponement and logistics flexibility. It also studies the performance differences of the identified groups of retailers. Finally, Paper 6 uses Structural Equation Modelling to explain the impact of postponement on logistics flexibility and well as that of the latter on firm performance. Also, the logistics flexibility-performance relationship is examined in the presence of uncertainty contingencies and logistics integration. Papers 5 and 6 use both strategic and financial measures of performance from subjective self-reported, as well as objective secondary sources.

The results of the thesis show that postponement is gaining increased attention among scholars and practitioners. There is an expanding tendency towards involving other supply chain actors, including logistics service providers and especially consumers, in postponement activities. The case studies point to the different approaches to logistics flexibility and varied performance of retailers. The taxonomy study based on the configuration approach in Paper 5 is an attempt to tackle the complexity in understanding the logistics practices of retailers. Three groups of retailers were identified regarding their logistics configurations based on postponement and logistics flexibility, labeled as Rigid, Speculative, and Responsive. These groups were compared in relation to their financial and strategic performance, and it was shown that if speculation and logistics flexibility are high, then financial performance would be generally higher. If postponement and logistics flexibility are high, then strategic performance would be higher. Also, the thesis provides empirical support for the role of postponement in increased logistics flexibility in retailing. Also, higher logistics flexibility was proven to be associated with higher strategic firm performance. The impact of logistics flexibility on firm performance was shown to be moderated by uncertainty as well as by logistics integrations. As a result, performance is higher when both logistics flexibility and uncertainty are higher or lower. However, logistics integration proved to have contrasting positive and negative moderating roles when considering strategic and financial performance respectively, which could be traced back to the potentially high monetary engagement connected to logistics integration.

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I Introduction

In this chapter, after an overview of the developments of the retailing industry, some facts regarding retailing in Sweden are presented. By setting the stage via the problem discussion, the overall thesis purpose along with the corresponding research questions are introduced. Finally, the intended contributions and limitations of the thesis are highlighted.

I.1 Background

Today's retail market is characterized by a high level of turbulence where several conventional management approaches have proven to be unavailing (e.g., Reynolds et al. 2007; Ganesan et al., 2009). Retailers as individual actors are involved in a wide range of activities including, developing strategies, analyzing customers, choosing markets and channels, making location decisions, providing ambiance, organizing operations and managing employees and stores, and finally finding, designing, purchasing, pricing, and promoting merchandise and services (Kamakura, Kopalle, & Lehmann, 2014; Levy & Grewal, 2001). The fact that Supply Chain Management (SCM) in a retail setting brings the business-to-business and business-to-consumer areas together, makes the gap between the two obsolete, artificial, and irrelevant (Dant & Brown, 2008).

The body of research on retailing has expanded rapidly and includes mainly their operations and relationships. Meanwhile, the retail trade has experienced major developments; therefore, some scholars call for viewing the research on retailing within the broader framework of conceptual thought on international business (Alexander & Myers, 2000). Retailers are the final links in supply chains which interact with consumers and play a crucial role by providing several value-creating functions including: providing an assortment of products and services, breaking bulk, and holding inventory (Levy & Weitz, 2012). Retailers were once adequately viewed as the passive recipients of products that were allocated to the stores by manufacturers in anticipation of demand (Ferne & Sparks, 2004). Today, retailers' position has changed to being dynamic designers and controllers of products and services supply in relation to customer demand. Meanwhile, the power of retailers has increased substantially, and they actively organize and supervise their respective supply chains, all the way from supply and production to consumption (Hofer, Jin, Swanson, Waller, & Williams, 2012). In what they call "modern retailers", Abrahamsson and Rehme (2010) discuss the role of logistics to be to create profitability and to support growth and market expansion. These issues have led to severe changes

in supply chain designs to increase the flexibility in dealing with the classic problem of managing inventory in an uncertain environment.

Fernie (2007) highlights that retailers have been in the forefront of applying best-practice principles to their businesses and have been acknowledged as innovators in logistics management. The retail industry has undergone several changes both in terms of strategies and formats. Figure 1 depicts the major phases that the retailing industry has gone through over the past decades in relation to SCM. In brief, there has been a significant shift from a *supplier-control* scenario to a more *relationship* one since the 1980s, during which retailers themselves built regional distribution centers (RDCs) to reduce the burden of high inventory levels and longer lead-times (LT). This is in line with what Abrahamsson (1993) refers to as “Time-Based Distribution”. Along with the general SCM developments and initiatives, such as logistics integration solutions, retailers have opted for turning manufacturers into partners. Moreover, the internet has hugely transformed the way retailers do business with the suppliers and consumers, in terms of further integration, offering more stock keeping units (SKUs), and further customization (Grewal & Levy, 2009). Although such integrative initiatives have generally helped supply chains with seamless flows, they have proven to be costly to implement, and occasionally overly complicating certain activities. More recently, with the prevalence of social media and mobile platforms, as well as increased shopper savviness and expectation, retailers have explored means to improve the total shopping experience.

As an example, MyFab, an innovative French furniture e-tailer, which was established in 2008, is offering a totally new concept. As opposed to its competitors which are highly dependent on building large stocks of inventory, MyFab encourages potential customers to vote for some candidate designs. Then, it starts placing orders for the most popular ones to its manufacturing suppliers and later ships the products directly to the customers from the manufacturing sites through logistics providers. This “overly simplified” version of managing the supply chain and the innovative concept that offers products that cost substantially less than competitors is believed to be changing the industry more than any other company “since IKEA” (Girotra & Netessine, 2011) which increases the retailer’s flexibility in meeting the demand. Another example is Atol, one of the largest French eyewear retailers, which offers a rather unique shopping experience to its customers to customize and try on optical glass frames online via a smartphone app. The app makes use of “augmented reality” techniques where the frames are placed on the customer’s face via mobile cameras. Customers can choose among a wide variety of options in rims, bridges, hinges, temples, nose pads, among others, in terms of colors and different designs. Then, they can order their favorite glasses and be charged on their next cell phone bill. Later, Atol places orders to their suppliers in China, does the assembly in their warehouse, and finally, locates a dealer on Google Maps and informs the customer via SMS to collect their glasses.

Introduction

Trikoton, a German clothing manufacturer and retailer, offers customers knitted vests, scarves, or leggings that are knitted specifically based on their voices. Through a recording software on their website that analyzes customers' voices, the microcontrollers attached to the knitting machines start 24 small engines that imitate a pattern card filled based on the user input. In this way, Trikoton "handcrafts" and sells "coded" clothing in a mass production manner that are shipped worldwide. By highlighting the retailing and SCM initiatives, these examples point to the general trend in providing a better shopping experience and customization through use of technology and involvement of several actors. All in all, from a retailer's standpoint, the practices introduced improve the ability to meet a myriad of demand requirements and variety, especially; in the light of uncertainty by creatively delaying certain activities.

1.2 Raising the Problem

From Figure 1 it could be noted that a major struggle of retailers over the years has been managing inventory; i.e., finding a balance between inventory levels, lead-times and service levels. Much academic effort in SCM has been devoted to the challenges caused by the ever-increasing competition in the market and extremely demanding customer requirements, as well as managing inventory. This setting is coupled with other environmental munificence, uncertainty and dynamism, including technological complexity, conflicts, and turbulence. After decades of attempts in managing resources and aligning operations with customer demands, many supply chains still fail in successfully tackling these issues. These challenges are even more severe in the context of retailing since retailers, as the final nodes in supply chains, are in the forefront of transacting with consumers, and at the same time are prone to severe rapid developments.

European retailers, specifically, have experienced a 30% increase in the overall SKUs listed between 2000 and 2009 (Sternbeck & Kuhn, 2014). Especially, with the online/offline channel integration in retailing, managing inventory levels becomes of utmost importance (Gallino & Moreno, 2014). Sweden is an interesting and dynamic retail marketplace, in which the retail sector has experienced significant growth for more than a decade outperforming most other Western European countries (Hultman & Elg, 2013). The Swedish retail trade had a total turnover of 646 billion SEK in 2013 employing 280,000 individuals (HUI Research, 2014). Figure 2 depicts the increasing trend in sales volume in the Swedish retail trade in the past two decades. Retailers in Sweden typically have an annual inventory turnover rate of three (HUI Research, 2014).

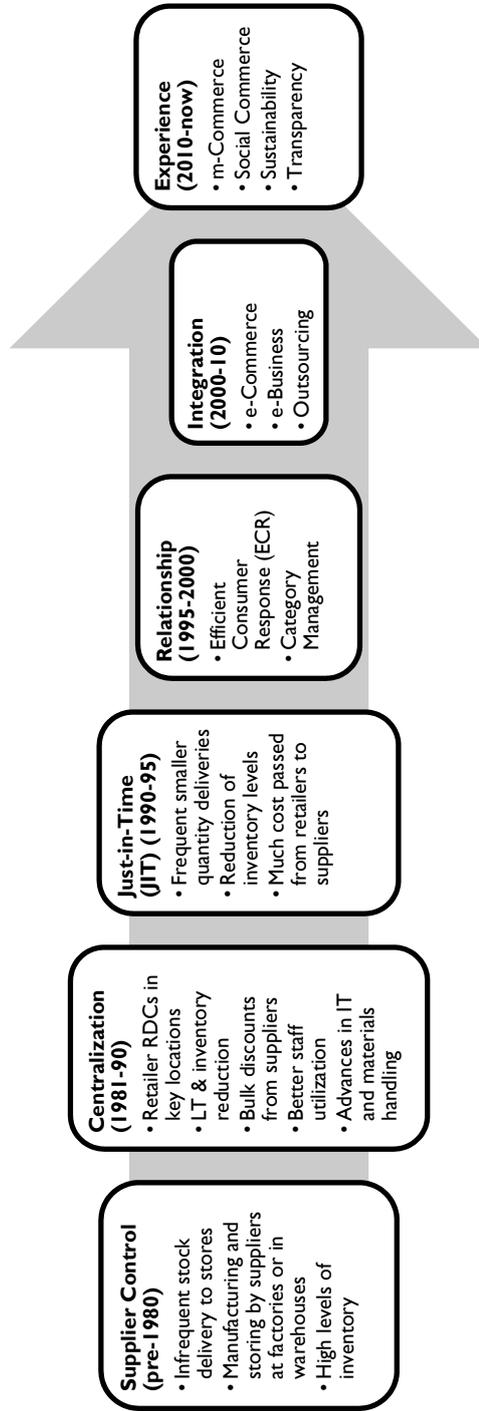


Figure 1 Stages in Retail Supply Chain Development

Source: Partly Based on Fernie et al. (2000) and Fernie et al. (2003: 192)

Introduction

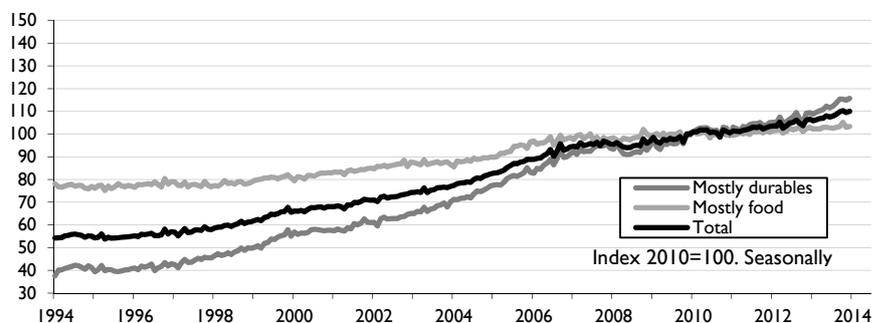


Figure 2 Retail Trade, Sales Volume

Source: Statistics Sweden¹ (Data up to and including June 2014)

From a research standpoint, using a “temporal lens” has been regarded as the appropriate means of looking at uncertain and dynamic situations to grasp a better understanding of not only the processes and practices but also the speed of changes (Ancona, Goodman, Lawrence, & Tushman, 2001). Time-based performance has been on the front page of scholarly and practice agenda and has proven to impact overall firm performance (Droge, Jayaram, & Vickery, 2004; Lee, 2004; Nahm, Vonderembse, Subba Rao, & Ragu-Nathan, 2006). Moreover, retailers often impose time pressure on their supply chains, such as by tight and demanding deadlines, due to shopper reactions to new merchandise, early seasonal weather changes, and last-minute promotions to meet quarterly sales goals (Thomas, Esper, & Stank, 2010).

“Time” is inherent in dynamic capabilities. Firms that develop dynamic capabilities have proven to outperform the competition in the long-run (Teece, 2007). Flexibility is a well-established avenue for exerting control in uncertain environments (Eisenhardt & Martin, 2000; Fredericks, 2005). Besides the reactive aspect of flexibility, much attention has been drawn to the proactive property of flexibility. Xerox, IBM, and Volkswagen have undertaken large scale transformations to increase competitiveness, in this regard (Sawhney, 2006). The fundamental premise of flexibility is that resources can be deployed and coordinated; and, thus they can be bundled to form capabilities (Liao, Hong, & Rao, 2010).

Flexibility has been empirically assessed as a logistics capability of a firm by some scholars (Hartmann & de Grahl, 2011), and is defined as the ability to quickly reconfigure resources and activities in response to environmental demands (Wright & Snell, 1998). Flexibility has several components; however, logistics flexibility is considered as one of the most important of them all (Paulraj & Chen, 2007b). By supporting an assortment of delivery needs and

¹www.scb.se/Statistik/HA/HA0101/2014M06D/HA0101_2014M06D_DI_01_EN_Portalen.xls

enabling a firm to be more responsive to product delivery demands logistics flexibility improves a firm's chances for gaining a competitive edge and outperforming the competition (Swafford, Ghosh, & Murthy, 2006b).

The majority of the body of the literature on flexibility pertains to the manufacturing setting. However, what is evident in the structure of supply chains over the course of the recent decades is that the distribution and downstream side, especially retailing, has come to the forefront of attention. Contemporary retail market is characterized by a high level of turbulence requiring further attention to flexibility (e.g., Reynolds et al. 2007; Ganesan et al., 2009). The question arises as how retailers can perform better due to logistics flexibility under environmental uncertainty. The fact is, as the facades of supply chains, retailers face individual shoppers and consumers who take higher quality, on-shelf availability, wide assortments, speedy delivery, after-sales services, fun shopping experience, and lower prices for granted. Internet and mobile services such as price-comparison apps and social media reviews have made it easier for shoppers to cross-shop in a transparent multi-channel setting. Provided with a wide set of choices of retailers – even at a click's distance – shoppers' expectations are ever-increasing to even include customization and personal services. Therefore, the challenge for retailers is straightforward and evident: in what ways can they better serve customers with availability, speed, delivery, and quality in an efficient and effective way, and meanwhile, meet financial and strategic performance targets?

Obviously, keeping loads of inventory in stock in anticipation of unknown demand cannot be an option in the majority of the scenarios. First of all, this requires high investments in infrastructure, including warehousing, IT systems, and personnel. Plus, if a wide assortment is carried, planning and merchandising could get further complicated. This should be seen in the light of the fact that inventory is one of the largest assets for the supply chain – as much as 30% of manufacturers' assets and 50% of the assets owned or carried by wholesalers and retailers (Twede, Clarke, & Tait, 2000). Second, for many product categories, including those with short life cycles and shelf lives, or those of perishable nature, this option is not practically viable. Moreover, from a product lifecycle standpoint, finished products in stores are in their most expensive state. A case of the automotive industry studied by Holweg and Pil (2004) shows that among the various levels of inventory that is held throughout the supply chain, finished cars in dealerships are kept for a longer period. This incurs high depreciation and opportunity costs. In turbulent situations, in which the whole supply chain is affected, such as in natural disasters, forecasting becomes next to impossible.

Therefore, the problem seems to have much in common with the basic inventory and flows management in the SCM literature on how much and for how long inventory should be kept to balance out the costs of lost sales and holding inventory? Beyond this simple problem is the question of adjusting flexibility in meeting customer demand under conditions of uncertainty, in

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relation to performance. As a well-established and yet evolving supply chain concept, the principle of postponement has proven to be highly relevant and appealing in this regard. In simple terms, the principle calls for delaying, or postponing, the point of product differentiation (Boone, Craighead, & Hanna, 2007; van Hoek, Vos, & Commandeur, 1999), or considering a base level of predictable demand for products – that can be planned for – and to postpone the production or distribution of the demand above the base level (“surge”) (Christopher & Holweg, 2011). In this regard, postponement represents a major strategic alternative to sales forecast-based distribution systems (Zinn, 1990) that can deal with uncertainties and reduce the risk of having the wrong product at the wrong place at the wrong time in the wrong condition (Twede et al., 2000). Postponement is generally considered as “a basic technique” leading to higher flexibility (Tang & Tomlin, 2008; Waller, Johnson, & Davis, 1999; Waller, Dabholkar, & Gentry, 2000), agility (Holweg, 2005), or “agile capability” (van Hoek, Harrison, & Christopher, 2001). Yang, Burns, and Backhouse (2004a) argue that in a manufacturing context, postponement, via its manifestation, customization, leads to agility. Therefore, customization is regarded as an outside-in result of applying postponement (LeBlanc, Hill, Harder, & Greenwell, 2009; Waller et al., 2000).

Theoretically, postponement aims at delaying certain activities in the supply chain until customer orders are received or better information is realized (Li, Ragu-Nathan, Ragu-Nathan, & Subba Rao, 2006; van Hoek, 2001; Yang, Burns, & Backhouse, 2004b). As a well-established supply chain, distribution, and marketing principle, practically, it dates back to the 1920s (Council of Logistics Management, 1995), and has been studied since the seminal work of Alderson (1950). Postponement has proven to help supply chains to deal with market demands in terms of quality, delivery, pricing, and variety (Appelqvist & Gubi, 2005; Brown, Lee, & Petrakian, 2000; Goodrich, 2007; Rahimnia & Moghadasian, 2010; van Mieghem & Dada, 1999). Moreover, ever since its introduction, postponement has attracted both practitioners and academicians exponentially. Right before the turn of the century, Morehouse and Bowersox (1995) predicted that it would increase in application, to the extent that by 2010, half of all inventory throughout the food and other supply chains would be retained in a semi-finished state waiting for finalization upon customer orders. Anderson et al. (1997) view postponement to be one of the major principles in SCM. In a similar slant, theoretical reviews have proven that the interest in postponement has significantly increased among researchers in the past three decades (Boone et al., 2007; van Hoek, 2001; Yang et al., 2004b).

Much of the popularity of postponement has been due to the augmented interest in being as close as possible to consumers (Appelqvist & Gubi, 2005; Graman & Bukovinsky, 2005; Haug, Ladeby, & Edwards, 2009), and e-business (Grewal & Levy, 2009; Yang et al., 2004b). In this regard, retailers as the final stages in supply chains that are in the forefront of engaging and transacting with consumers (Ganesan et al., 2009), should be no exception in being

involved in some sort of postponement, either as an actor involved in an activity delayed from further upstream or as an actor delaying an activity further downstream.

Interestingly, while retailers have shifted from being passive recipients of products from manufacturers in anticipation of demand (see Fernie & Sparks, 2004 for a discussion), consumers are also recently extremely actively involved in “co-creating value” (Andreu, Sánchez, & Mele, 2010; Lusch & Vargo, 2006; Vargo & Lusch, 2008) and participate in customization processes (Firat, Dholakia, & Venkatesh, 1995). Therefore, with this “multiple role playing” in supply chains, there seems to be a great relevance and potential for retailers to apply postponement in their operations. However, the recent general perception appears to be that postponement is associated with manufacturing and production environments (see Feitzinger & Lee, 1997; Hermansky & Seelmann-Eggebert, 2003; Huang & Li, 2009). In this regard, such deployment in retailing seems to have been a missing link in the literature despite the fact that some retailers have proven to be role models in this realm. The remarkable cases of Bang and Olufsen (Appelqvist & Gubi, 2005), Benetton (Dapiran, 1992) and Zara (Christopher, 2000) have been among the few such examples. One can still argue that the high level of forward or backward integration among these retailers (mainly related to ownership), could be convincing enough to assimilate these retailers with typical manufacturers who practice retailing as well. As a result, it is both academically and practically appealing to investigate such application in relation to flexibility in the realm of retailing.

1.3 Purpose and Research Questions

In a broad study of retail SCM priorities and practices, Randall, Gibson, Defee, and Williams (2011) found that in light of uncertain economic conditions, retailers develop more agile/responsive SCM strategies. Meanwhile, building on the expectation of the increase in the application of postponement and its importance regarding flexibility (Boone et al., 2007; Morehouse & Bowersox, 1995), it is reasonable and timely to study this supply chain concept in a retailing context. This thesis is an attempt in shedding light on postponement, logistics flexibility and performance in a retail setting. Therefore, the purpose of this study is:

To explore the application of postponement and logistics flexibility in retailing, and to investigate the resulting firm performance.

In line with the overall purpose, some research questions can be developed. First of all, retailing is a very complicated business (Levy, Grewal, Peterson, & Connolly, 2005), and its definition has been a means of controversy (Dant & Brown, 2008). For instance, some definitions of retailing tend to focus on the

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distribution and sales aspect of it: “Final activities and steps needed to place merchandise made elsewhere into the hands of the consumer or to provide services to the consumer” (Dunne, Lusch, & Carver, 2014: 4). This definition is in line with how NAICS² (2007) sees the retail trade:

“The Retail Trade sector comprises establishments engaged in retailing merchandise, generally without transformation, and rendering services incidental to the sale of merchandise.”

Meanwhile, following the definition, it is stressed that “establishments that both manufacture and sell their products to the general public are not classified in retail, but rather in manufacturing. However, establishments that engage in processing activities incidental to retailing are classified in retail. This includes establishments, such as optical goods stores that do in-store grinding of lenses, and meat and seafood markets”. The Swedish Standard Industrial Classification (SNI, 2007)’s definition also stresses “sales without transformation”, since the operations within retail, including sorting, separating, mixing, and packaging, generally “do not affect the substantial characteristics of [products]”.

However, such definitions seem to have been generally developed for means of justifying general national industry classifications and seem to be non-comprehensive and contradictory at some level. For example, “substantial characteristics of products” seems to be blurred and could be discussed from utility and value perspectives. This definition is in line with the conventional view on retailers considering them as the passive recipients of products that were allocated to the stores by manufacturers in anticipation of demand (Ferne & Sparks, 2004). However, considering the changes in the role and power of retailers, some scholars tend to underline any value creating activity happening in the final stages of supply chains:

“Retailing is a set of business activities that adds value to the products and services sold to consumers for their personal or family use.” (Levy & Weitz, 2012: 6)

From this perspective, products are not necessarily “made elsewhere”. Moreover, retailing does not only include retail firms and could entail several actors located in the supply chain. Considering the developments in the retailing industry, a study of the application of “delayed value-creation” in retailing seems valuable. Such study could serve to further transfer scholarly knowledge from established SCM literature from manufacturing to retailing. Also, although generally the conception in the SCM is that postponement allows firms to be more flexible, especially in developing product variety, meeting customer demand, and differentiation (Tang & Tomlin, 2008, Prasad, Tata, & Madan, 2005; Waller et al., 1999), such connection needs further elucidation. Therefore, in order to shed light on the application of

² North American Industry Classification System

postponement in retailing, as well as its connection to logistics flexibility, the following research question is proposed:

RQ₁: How is postponement applied in retailing and how could such application be connected to logistics flexibility?

With this research question and by focusing on retail firms, different types of postponement applied will be explored along with providing insights on the role of different actors involved. Customization is regarded as a manifested result of applying postponement, has been widely studied in close connection to – or even interchangeably with – postponement (LeBlanc et al., 2009; Waller et al., 2000). In order to practically capture how postponement could be applied, focusing on customization has been a prevalent approach among scholars (Graman & Bukovinsky, 2005, Feitzinger & Lee, 1997). Therefore, with this research question, the manifestation of postponement in customization processes will be explored as well. Also, an assessment of the level of logistics flexibility of the retail firms will be provided to understand how postponement and logistics flexibility are related.

Managing logistics in retailing is very complex. Perhaps, finding two retail institutions that have exactly similar logistics practices, supplier relationships, and performances is a daunting task. Therefore, retailers could have unique combinations of managing and practicing different logistics activities. While practically, there are several ways to achieving superior performance, defining one best set of practices would not virtually make much sense. As a result, in relation to the overall purpose, further exploring postponement and logistics flexibility should lead to facilitating the understanding of the different resulting configurations of these logistics practices by retail firms. Therefore, it would be of interest to explore different sets of retail firms with similar characteristics in terms of logistics practices and flexibility to understand if and how they perform differently. Therefore, the following research question is suggested accordingly:

RQ₂: Is it possible to identify a taxonomy of retailers based on their application of postponement and levels of logistics flexibility, and if so, do these groups have different performance levels?

By exploring this empirical taxonomy of retailers, a better picture of the current situation of retailing logistics configurations and performance could be realized. As a result, retailers could be grouped into more manageable sets based on certain predefined underlying similarities.

Finally, in order to address the latter part of the overall purpose, the following research question is proposed:

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RQ3: How does application of postponement affect logistics flexibility, and how does logistics flexibility impact performance providing uncertainty and logistics integration?

As discussed earlier, along with the developments in retail SCM, retailers are exposed to high uncertainty and have experimented initiatives relating to logistics integration. The concern with this research question is to explain how postponement, logistics flexibility, and performance are related. The effect of flexibility on long-term performance of firms is well documented in the literature (Nair, 2005; Swafford et al., 2006a). Meanwhile, finding a fit between internal strategies and structures, and environmental variables such as uncertainty, has proven to be the key in achieving better firm performance (Wagner, Grosse-Ruyken, & Erhun, 2012). Along similar lines, logistics integration is conceived of being influential on firm performance. Logistics integration refers to “specific logistics practices – operational activities that coordinate the flow of materials from suppliers to customers throughout the value stream” (Stock, Greis, & Kasarda, 2000: 535). In light of integration, retailers can better react to changes in customer demand and minimize demand and supply mismatches which leads to preventing expensive waste of inventory and effort (Richey, Adams, & Dalela, 2012). However, the positive performance outcomes associated with higher logistics integration has been an area of debate and disagreement among scholars. While several operational and strategic performance benefits of integration have been documented, the financial investment cost, and the possibility of creating further complexity, have put its benefits to question (Fabbe-Costes and Jahre, 2008, Das, Narasimhan, and Talluri, 2006, Hertz, 2001). Therefore, in addressing this research question, the impact of logistics flexibility on performance will be viewed in light of uncertainty and logistics integration. In this regard, a working conceptual model is presented in Figure 3 which depicts the relationships explained by addressing RQ3.

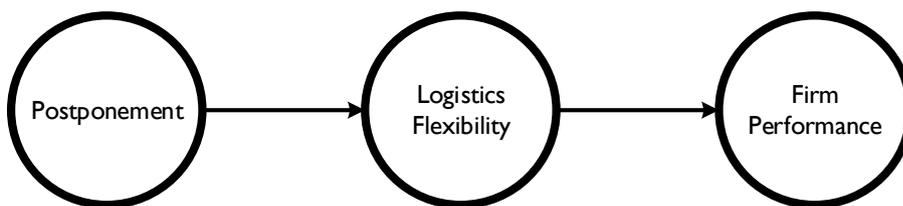


Figure 3 Working Conceptual Model

Figure 3 is a simplified conceptual model. Before the last research question could be answered, different types and components of postponement and

logistics flexibility should be identified since both concepts have evolved and there is little consensus regarding their scope, definition, and measurement.

1.4 Intended Contributions and Limitations

The dissertation is intended to add to the current literature on SCM by focusing on postponement, logistics flexibility, and performance in a retailing context. First, two systematic literature reviews are carried out separately on the concepts of postponement and logistics flexibility to identify their types, developments, emerging themes, and respective measurements. This dissertation is unique in the sense that postponement and logistics flexibility in a retailing environment are studied simultaneously in relation to performance in one study. Most prior studies have either considered the concepts individually or mixed them with other distinct concepts in the SCM literature. Logistics flexibility has been studied as a stand-alone concept, and not as a simple sub-construct of supply chain or value chain flexibility. Moreover, this study contributes to the retailing literature by focusing on the retailers mainly in Sweden, as opposed to the vast majority of the existing literature on postponement and flexibility that have a manufacturing focus. This thesis contributes to the literature by including both subjective and objective measures of performance (strategic and financial) while most prior studies consider either of them. By taking a competency/capability view on postponement and flexibility, both upstream and downstream sides of flexibility are accounted for, although the level of analysis of the thesis is firms and not the extended supply chains. Also, both internal and external aspects of integration are taken into consideration.

Methodologically, the thesis takes a mixed methods approach, which is widely called for in SCM and retailing literature. The overall study design, including the survey and in-depth case studies, are unique to the postponement and logistics flexibility literature. The coding and analysis in the systematic literature reviews, as well as in the qualitative studies, are carried out by using the NVivo software which could, besides increasing the overall validity, have pedagogical implications.

From a practical standpoint, the thesis can reveal which activities could be potentially postponed and how retail managers can benefit from the principle of postponement to increase logistics flexibility. It also sheds light on the importance of competencies in creating logistics flexibility which leads to overall better strategic and financial firm performance. The study could indicate which logistics configurations of retail firms resulting from applying postponement and logistics flexibility can potentially be associated with different firm performance outcomes.

The focus of the thesis is on retail firms which mainly deal with selling merchandise (except for motor vehicles and motorcycles). For instance, typical

“service retailers” such as banks, hospitals, and travel agencies are not included in the study. The study deals with certain SCM issues by taking retail firms as focal firms. In the qualitative case studies, some insight from the relationship between retail firms and their immediate first tier suppliers, service providers, as well as consumers is provided. However, studying other tiered suppliers are not within the scope of the study. Therefore, the unit of analysis is retail firms in supply chains. The limitations to the choice of method, study design, and sampling are addressed in the Method Chapter.

1.5 Disposition of the Thesis

This dissertation consists of two main sections. The first section, which also comprises the Introduction chapter, includes the literature and theory addressed in the dissertation, which is presented in Chapter 2. In this chapter, the theoretical underpinnings as well as the literature on postponement and logistics flexibility is overviewed. The chapter starts with a brief overview on “timing” to underline the importance of timing decisions in time-based competition. Also, the concepts of logistics integration and environmental contingencies which are later considered as moderating constructs on the relationship between logistics flexibility and firm performance are presented. Finally, the theoretical perspectives brought forward by the configuration and the resource-based view of the firm are presented. In Chapter 3, the method is discussed in detail which encompasses discussion on the study design, data collection and research approach. Further information regarding method is provided in the attached papers. Chapter 4 involves a summary and discussion on the findings of the dissertation. Finally, in Chapter 5 some concluding remarks are presented. In Chapters 4 and 5, the research questions, and the overall thesis purpose are addressed.

The second section comprises the six articles. The articles are intended to address the overall purpose of the thesis by focusing on the research questions. The first two articles are systematic literature reviews on postponement and logistics flexibility which serve as an input to the consecutive articles. Paper 3 is an exploratory study which aims to explore how postponement is applied in retailing and how such application could be connected to logistics flexibility. This study specifically addresses RQ₁ by means of a set of three exploratory empirical cases of Media Markt, Lidl, and Jysk. Also, this paper provides insights from some logistics providers and suppliers. Paper 4 looks at how customization, a manifestation of postponement, is practiced in retailing in the nexus of retailers and consumers. The paper explores the process of customization by investigating how retailers and consumers interact in bicycle retailing. The study also contributes to addressing RQ₁ and is based on qualitative empirical data gathered on three small upscale bicycle retailers. Papers 5 and 6 are quantitative studies dealing with RQ₂ and RQ₃ respectively,

and are based on large-scale samples drawn from retailers in Sweden. Paper 5 is an exploratory taxonomy study which follows the findings from Paper 3 to identify meaningful groups of retailers regarding their logistics configurations resulting from postponement and logistics flexibility. It is further investigated whether these clusters of retailers have different performance. Paper 6 uses Structural Equation Modelling (SEM) to investigate the relationships between postponement and logistics flexibility, and logistics flexibility and performance. The latter relationship is further tested in light of uncertainty and logistics integration. Figure 4 depicts the flow and order of the papers along with their purposes.

1.6 Summary

This chapter presented an introduction to the dissertation. It started with some instances of the application of postponement and touched upon the main issues related to this concept, specifically flexibility. This background was followed by an overview of the developments of retail SCM as well as the current status of retailing in Sweden. The problem discussion further covered issues such as uncertainty, benefits of generic products to flexibility, and multiple role playing of actors in retailing. Following this stage setting, the purpose was presented along with three research questions. Finally, the focus, limitations, and intended contribution of the dissertation were presented followed by an overview of the interconnection of the Papers included in the dissertation.

Introduction

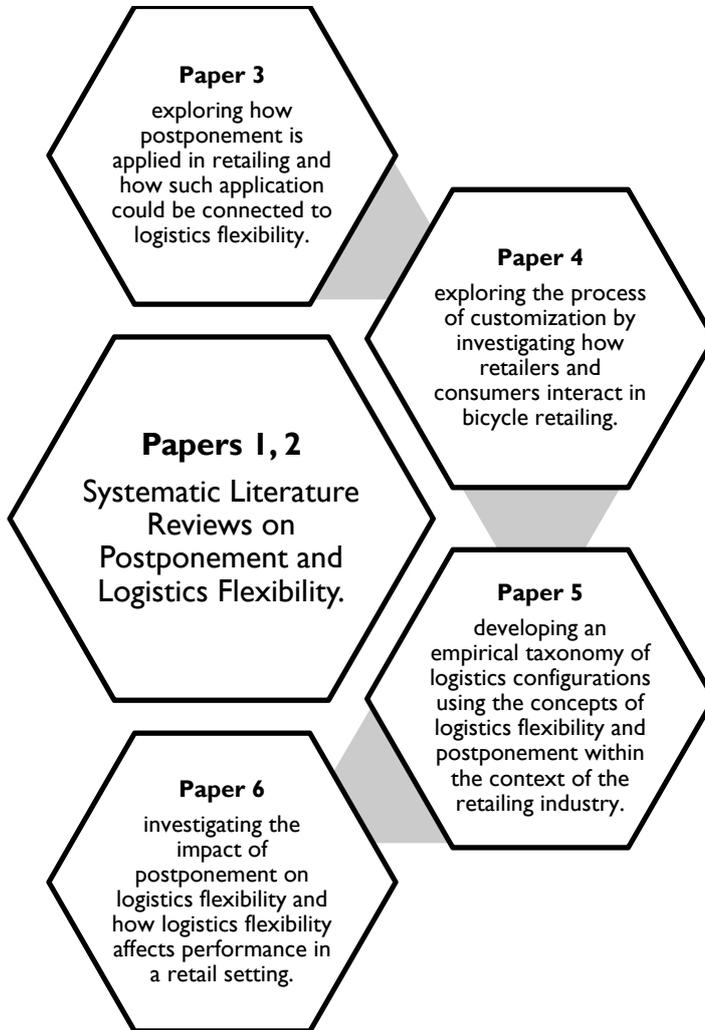


Figure 4 Interconnection of the Papers Included in the Dissertation

2 Literature and Theory

In this chapter, an overview of the theories and main concepts addressed in the dissertation is provided. Specifically, this chapter reflects on the working conceptual model presented in Figure 3 and provides a review of the literature which will be used to further develop the conceptual model in the following chapters. Chapter 2 starts with a brief overview on time and timing which are the underlying issues in postponement and logistics flexibility. A brief discussion on environmental contingencies is provided later followed by reviews on logistics flexibility and postponement. Before presenting logistics flexibility, flexibility in its broader sense is introduced. In discussing postponement, the concept of decoupling point is discussed which precedes a summary on postponement types and a review of the customization literature in relation to postponement. Specifically, the literature on postponement and logistics flexibility are further discussed in Papers 1 and 2. Later, logistics integration and performance are presented which will be addressed later in the empirical studies. Finally, the theories used in the conceptual development of the dissertation as well as the empirical papers are reviewed.

2.1 Introduction

Time and Timing

Time decisions have long been the concern of logistics and SCM scholars, especially, in relation to performance. Cornerstone issues such as JIT, lean, lead-times, flexibility, integration, and postponement, deal with time and timing in one way or another. Time is inherent in the definition of change itself (Huy, 2001). Time is an abstract, complex and intangible concept that is central to organizational and management research (Bluedorn & Denhardt, 1988). Timing refers to when an act is performed, not in isolation but in a dynamic context; thus, “when” matters for the outcome since conditions change over time, especially in sequence based models in marketing and logistics (Andersson & Mattsson, 2006).

Ever since Taylor’s time and motion studies, faster has been perceived to be a corollary to less costly, especially in industries specializing in mass production or high-volume service (Orlikowski & Yates, 2002). Strategy scholars generally prescribe that research should incorporate temporal aspects of strategic choices since definitions of strategy conceptualize it dynamically as a flow or stream of organizational actions (Mosakowski & Earley, 2000). Time is an elusive notion, possibly because it is essential to all human understandings of our world (Halinen, Medlin, & Törnroos, 2012). The common preoccupation with time as measured by the hands of a clock is a relatively modern phenomenon (Davies, 1994). Much scholarly contribution deals with the way time is understood; its

objectivity or subjectivity. Rhetorically, from Greek mythology, *chronos* represents serial chronological time, while *kairos* represents a reference point from a significant event in time (Orlikowski & Yates, 2002). Clock time or absolute time is the interpretation of time that has evolved through history to become referred to as the objective view of time (Aaboen, Dubois, & Lind, 2012). Event time, however, is a social construction in which the boundaries of the present rely on a past and future time (Halinen et al., 2012).

Crossan et al. (2005) discuss that event time management has a focus on flexibility, in order to respond to internal and/or external changes or events and, ultimately, to maintain an organization's competitive position either reactively or proactively, while clock time management implies "manipulation, active planning, and execution of strategic action". Ancona et al. (2001) argue that by using a "temporal lens", one can think not just about processes and practices but also how fast they are moving. Dynamic capabilities require that an organization has two temporal orientations: the present and the future (Ancona et al., 2001). Several SCM scholars have called for time-related performance measures. Jayaram, Droge, and Cornelia (2000) suggest considering new product development time, lead-time, delivery speed, and responsiveness to customers as suitable time-based performance measures in SCM. Stalk (1988: 41) refers to time as "a strategic weapon [...] equivalent of money, productivity, quality, even innovation". Thomas (2008) also highlights the strategic role of time in "time-based competition theory" and discusses how time and speed in logistics can yield superior performance.

Environmental Contingencies – Dynamic Capabilities

Several managerial decisions have been criticized for the oversight of dynamism, environmental contingencies, and managers' role (Eisenhardt & Martin, 2000; Sirmon, Hitt, & Ireland, 2007). The reason is that, practically, managerial decisions concerning resources and capabilities are ordinarily made under conditions of uncertainty, complexity, and conflict (Amit & Schoemaker, 1993). One of the major challenges in SCM is to deal with uncertainty at different levels. Galbraith (1973: 5) defines uncertainty as "the difference between the amount of information required to perform a task and the amount of information possessed by an organization". In a manufacturing setting, the literature suggests three levels of uncertainty pertaining to product volume or demand, mix or specification, and delivery (Slack, 1993; Tachizawa & Thomsen, 2007; van Donk & van der Vaart, 2005).

Environmental dynamism is regarded as the strongest determinant of uncertainty (Fredericks, 2005). It refers to the frequency of change and turnover in environmental forces; for instance, changes in customer preferences and competitor strategies create difficulties in planning, coordination, and inventory decisions (Achrol & Stern, 1988). On the demand and market side, Rabinovich and Evers (2003a) count five aspects of volatility; namely,

instability, unpredictability, heterogeneity (customers desiring identical products), unintelligibility, and inconsistency. Competition uncertainty refers to the “extent of changes in primary competitors” nature and action regarding product development and technology adoption” (Zhang, Vonderembse, & Lim, 2002: 565). The authors consider other contingencies to be supplier and technology uncertainty. In dynamic markets, dynamic capabilities to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments are necessary (Teece, Pisano, & Shuen, 1997). Such dynamic capabilities enable businesses to create, deploy, and protect the intangible assets that support superior long-run business performance (Teece, 2007).

2.2 Flexibility

Flexibility is generally regarded as an effective dynamic capability (Wadhwa, Saxena, & Chan, 2008). In broad terms, flexibility has been defined by Upton (1994) as “the ability to change or react to environmental uncertainty with little penalty in time, effort, cost or performance”. Flexibility is a complex, multidimensional, and hard-to-capture concept (Zhang, Vonderembse, & Lim, 2005). Literature proposes several constructs to represent the flexibility related to purchasing, sourcing, or supply (Tachizawa & Thomsen, 2007). Arguably, *speed* and *timeliness* are widely considered as characteristics of flexibility (Duclos, Vokurka, & Lummus, 2003; Grawe, Daugherty, & Roath, 2011; Lummus, Vokurka, & Duclos, 2005; Nair, 2005). From this view, flexibility is the ability to quickly reconfigure resources and activities in response to environmental demands (Wright & Snell, 1998).

Various initiatives have been taken to systematically explain flexibility as a construct. Generally, there are two major approaches to explaining flexibility which have much in common; one in relation to the drivers and sources, and one in relation to competencies and capabilities. Tachizawa and Thomsen (2007) reflect on the reasons why flexibility is needed and how it can be achieved. In this way, they elaborate on “drivers” and “sources” of flexibility. Drivers are factors that determine the need for flexibility which are mainly related to internal or external uncertainty such as supplier, demand, or technology volatility. Sources, on the other hand, are the specific actions taken to generate flexibility, such as single-sourcing contracts with key suppliers (Jack & Raturi, 2002). Some scholars have used the range, mobility, and uniformity to explain flexibility; which relate to variety, speed, and quality, respectively (Koste & Malhotra, 2000; Upton, 1994). Watts et al. (1993) dichotomize flexibility into primary and secondary, which is to a great extent in line with the competency and capability approach to flexibility (Stalk, Evans, & Shulman, 1992). Flexible competencies, which are internally focused, provide the processes and infrastructure that enable firms to achieve the desired levels of flexible

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capabilities. On the other hand, flexible capabilities, which are externally focused, can be viewed as a linkage among corporate, marketing, and manufacturing strategy.

Some scholars consider flexibility to be a key characteristic of agility (Swafford, Ghosh, & Murthy, 2006a; Swafford, Ghosh, & Murthy, 2008; Swafford et al., 2006b); and hence regard flexibility as an internally-focused competency and agility as an externally-focused capability. Agility means using market knowledge and a virtual corporation to exploit profitable opportunities in a volatile marketplace (Naylor, Naim, & Berry, 1999). For instance, Swafford et al. (2006a; 2008; 2006b) see a firm's supply chain agility as "an overall organization capability" which "involves all processes within a firm plus the firm's suppliers and customers", where flexibility (manufacturing, sourcing, and distribution) is antecedent to agility. This approach leads to operationalizing flexibility by considering range (number of choices and heterogeneity) and adaptability (cost and time) (Sánchez & Pérez, 2005; Swafford et al., 2006b). This view considers agility at a higher level compared to flexibility in which manufacturing, procurement, distribution, labor, operations resources, technology and IT systems flexibility generally lead to agility. Reflecting on Swafford et al. (2006a; 2008; 2006b) and studies with similar conceptualization, Braunscheidel and Suresh (2009) question the clarity of such measures regarding unit of analysis (whether they deal with agility of the focal firm – which is mainly a manufacturer – or the entire supply chain). Christopher and Towill (2000) see agility as a business-wide capability that embraces organizational structures, information systems, logistics processes and, in particular, mindsets. They regard flexibility as a key characteristic of an agile organization. Similarly, Jüttner et al. (2010) highlight that the origins of agility as a business concept lie in flexible manufacturing systems but "flexibility" as its key characteristic was soon extended to the supply chain level. Along similar lines, Paulraj and Chen (2007b: 5) define agility as the "supply chain partners' superior performance in flexibility, time, delivery and responsiveness".

"Nature of demand changes" has been another criterion for distinguishing the two concepts. Lee (2004: 4), for instance, relates agility to "responding quickly to short-term changes in demand" while referring to "adjusting supply chain's design to meet structural changes" as adaptability. However, Upton (1994: 76), refers to this stream of discussion as "derailed" and regards both as flexibility since "most situations demand types of flexibility which allow change that may be seen as both reactive and proactive: the source of the need for the change depends on one's point of view, but is a separate issue from the ability to change". Some other scholars either use flexibility and agility interchangeably or do not engage in the arguments regarding their differences (Zhang et al., 2002; Zhang, Vonderembse, & Lim, 2003; Zhang et al., 2005) due to the fundamental nature of dynamic capabilities such as flexibility in being fast and timely. Addressing the confusion revolving around these interrelated concepts, Bernardes and Hanna (2009) propose considering flexibility when dealing with

changes regarding pre-established parameters, and agility when dealing with a new parameter set. They view agility as a philosophical approach. Responsiveness, on the other hand, pertains to “the ability to respond and adapt time-effectively based on the ability to ‘read’ and understand actual market signals” (Catalan & Kotzab, 2003: 677). Therefore, responsiveness is related to external-facing flexibility in response to some sort of external stimuli (mainly, customer demand) (Reichhart & Holweg, 2007a). Two other concepts discussed alongside flexibility, generally in the SCM risk management literature, are resilience and robustness. Resilience is “the ability of a supply chain to return to normal operating performance, within an acceptable period of time, after being disturbed” and robustness is “the ability of the supply chain to maintain its function despite internal or external disruptions” (Brandon-Jones, Squire, Autry, & Petersen, 2014: 55).

Supply chain flexibility has its roots in the manufacturing industry literature and hence has been mainly associated with manufacturing to an extent that it has been accused of neglecting the role of services (Stevenson & Spring, 2007). In the manufacturing context, flexibility is typically defined in terms of machine, material, labor, routing, volume, and mix flexibilities (Zhang et al., 2002). In this sense, modular supply chain design principles and delayed configuration – postponement – for customization have been considered as giving supply chains a potential source of competitive advantage (Brun & Zorzini, 2009; Waller et al., 2000). Cvsa and Gilbert (2002) contend that by postponing its ordering decision, a downstream firm retains operational flexibility to respond to demand information. Stevenson and Spring (2007) maintain that supply chain flexibility can and should be placed above other types of firm flexibility (e.g., manufacturing flexibility) in the “flexibility hierarchy”. They discuss that supply chain flexibility, in this sense, would incorporate all the internal issues inherent at the plant and firm-level together with a wider range of services and external sources of flexibility, including sourcing, procurement, and logistics. The flexibility hierarchy that they introduce includes operational flexibilities (at resource and shop level), tactical flexibilities (at plant level), strategic flexibilities (at firm level), and finally, supply chain flexibilities (at a network level). Another classification of supply chain flexibility provided by Duclos et al. (2003) includes operations system, market, logistics, supply, organizational, and information systems flexibility. However, Lee et al. (2010) argue that a major drawback with most of the existing flexibility classifications is that they simply focus on the importance of flexibility and that they are very difficult to implement in practice.

Logistics Flexibility

Zhang et al. (2005: 71) define logistics flexibility as the ability of a firm to respond quickly and efficiently to changing customer needs in inbound and outbound deliveries. In a similar fashion, Stevenson and Spring (2007) look at

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logistics flexibility as the potential to rapidly send and receive products cost effectively as customers and sources of supply change. Logistics flexibility has proven to enable superior customer service (van Hoek, 2001) by responding quickly and efficiently to needs for delivery, support and services (Zhang et al., 2002). Pagh and Cooper (1998) stress the potential of logistics flexibility in coordinating source, “make”, and “deliver” operations in order to cut cycle time and responding quickly to actual customer needs rather than satisfying demand through forecast-based inventory (Zhang et al., 2005). Zhang et al. (2002) highlight that logistics flexibility enables firms to customize product and service offerings without increasing stock levels. In this way, with flexible logistics competencies and capabilities, bundles of services, such as adding product features or providing specific packaging, labeling, and product configuration can be aligned with individual customer needs.

Taking a competency and capability view, Zhang et al. (2002, 2003, 2005; 2006) categorize logistics flexibility into four sub-components. In their view, physical supply and purchasing flexibilities are supply-side competencies that support customer-facing capabilities; namely, physical distribution and demand management flexibilities. This view is in line with, Langely and Holcomb (1992) who maintain that these capabilities lead to higher distribution flexibility, logistics customer value and demand management flexibility. The four components of logistics flexibility are shown in Figure 5. Based on this framework, Physical Supply Flexibility enables firms to coordinate the delivery of incoming goods while Purchasing Flexibility requires a heavy emphasis on information exchange and mandates effective and frequent communication with suppliers. Physical Distribution Flexibility is referred to by Porter (1985) as outbound logistics flexibility which deals with delivering the finished product to customers reliably and efficiently. Demand Management Flexibility facilitates communication with customers.

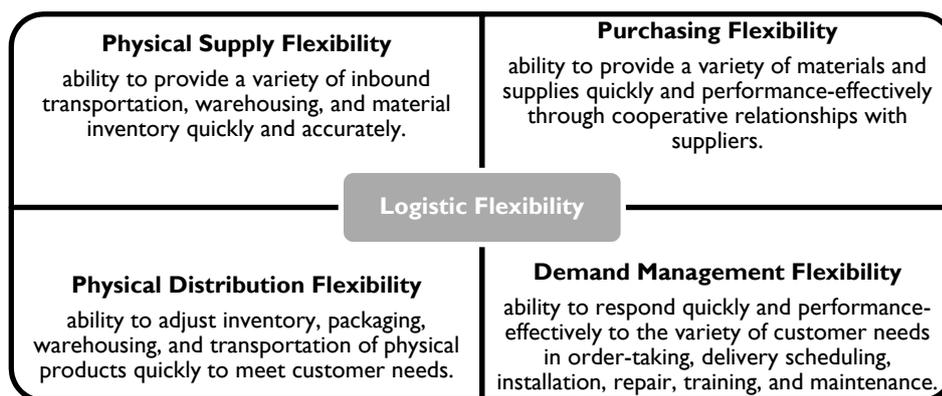


Figure 5 Sub-constructs of Logistics Flexibility

Source: Based on Zhang et al. (2002, 2005)

2.3 Postponement

Alderson was the first researcher who discussed the principle of postponement in his seminal article in 1950. In simple terms, he maintained that changes in form, identity, and location of products, are what causes product differentiation, and the closer to the consumer these changes are made, the more differentiated products become. He later called these changes “transformations” which increase value or utility for ultimate consumers (Alderson, 1965). Therefore, by delaying or postponing these changes, differentiation could increase. Alderson (1950) contended that through application of the principle of postponement, “marketing efficiency within a complete system of distribution can be promoted.” He counts the major benefits of applying postponement to be reducing the cost of sorting, and reducing marketing risks. He discusses that by analyzing the “postponeability” of individual steps in marketing channels, it might turn out that some steps may not need to be performed at all and could hence be eliminated. Cox and Goodman (1956) were also among the early scholars who extensively discussed the application of the principle of postponement in the marketing of house-building materials. They saw postponement as deferring each successive narrowing commitment in marketing channels as long as possible so as to reduce the likelihood and the cost of mistaken commitments.

In 1965, Alderson introduced his “transvection” concept, which has much in common with the current developments in SCM. He defines transvection as “a single unit of action of the marketing system [...] comprising all prior action necessary to produce a final result [an end product]” and placing it in the hands of the ultimate consumer (Alderson & Martin, 1965: 123). Alderson views transvections as complements to, and outcomes of series of transactions. He calls the basic function of marketing “sorting”, which he dichotomizes into assigning and selecting (the latter from a buyer’s perspective), and argues that each two successive transformations are intervened by a sort (Alderson, 1965). Some scholars have assimilated Alderson’s transvection to Porter’s concept of the value system (Priem, Rasheed, & Amirani, 1997; Priem & Swink, 2012)

Although Alderson admits that the principle of postponement is not “an answer to all planning problems in marketing”, Bucklin (1965), challenged Alderson’s work for not giving equal attention to what was the prevalent practice at the time – the converse of postponement – which he labeled “speculation”. He argued that ownership responsibilities in the channel as a whole cannot be avoided, and that some or groups of institutions “must continually bear this uncertainty from the time the goods start through production until they are consumed”. He discussed that by applying “changes in form, and the movement of goods to forward inventories at the earliest possible time in the marketing flow” (i.e., speculation), several other costs of the marketing system could be reduced. These costs reductions could be in

sorting and transportation by large quantity orders (rather than small frequent orders), or other large-scale economy related costs (such as in mass production), as well as costs of stock-outs (Engelseth & Jafari, 2012). Moreover, he argued that uncertainty could be reduced in a variety of ways, such as through the benefits of the principle of grouping in transforming risks to “more manageable forms of relatively predictable risks”. He, therefore, calls for considering postponement and speculation in duality, which he calls “The Combined Principle”. This view is believed to balance the advantages of postponement against the advantages of speculation (Zinn & Levy, 1988). This principle suggests that changes in time, place, or form of products should be made at the point (in time or place) where the total unit cost of distribution is minimized (Zinn & Bowersox, 1988). This point is referred to as the “point of differentiation” or “decoupling point” (Lee & Tang, 1997). It makes sense that postponement is cost effective whenever the reduced inventory carrying costs associated with the centralization of inventories exceed the additional cost of transportation, order processing, and lost potential sales (Zinn & Levy, 1988).

Decoupling Point

A major strategic decision in the design of the supply chain, according to Stevenson and Spring (2007), is the positioning of the customer order decoupling point, also known as the “order penetration point”. Decoupling point is the point at which strategic stock is often held as a buffer between fluctuating customer orders and/or product variety and distribution (Naylor et al., 1999). According to Mason-Jones et al. (2000), the decoupling point is the point in the material flow streams to which the customer’s order penetrates. It is here where order-driven and the forecast-driven activities meet. In this sense, it separates the part of the supply chain oriented towards customer orders from the part based on planning. As a result, by keeping products in a more generic form, producing or distributing more customized offerings could be made possible. Figure 6 illustrates how the positioning of the decoupling point through the supply chain can draw a line between supply chain decisions, practices, and strategies. This point “decouples” the uncertainty level due to better realization of demand.

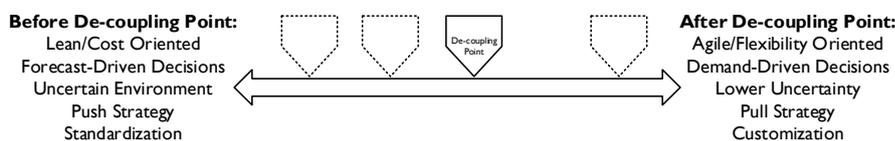


Figure 6 Positioning of the Customer Order Decoupling Point

Source: Base on Stevenson and Spring (2007)

The positioning of the decoupling point is affected by various factors, including market characteristics, product characteristics, production characteristics, and delivery and production lead-time (Olhager, 2003; Olhager, 2010; Pagh & Cooper, 1998). According to Davis (1993), the positioning of the decoupling point is associated with the issue of postponement which increases the efficiency as well as the effectiveness of the supply chain. Reflecting on the work of Mintzberg and Waters (1985) on strategies, Stevenson and Spring (2007) acknowledge that in many cases, it is unclear whether the positioning of the decoupling point is a deliberate or an emergent strategy; however, the flow of product up to the decoupling point may be forecast-driven, while, after the decoupling point, it should be demand-driven (Christopher & Towill, 2000). Similar to the product decoupling point is the concept of “information” decoupling point which reflects how far upstream real demand information penetrates. According to Christopher (2000), this point should be preferably positioned further upstream as opposed to the product decoupling point. Reflecting on information decoupling point, Mason-Jones and Towill (1999) argue how businesses should separate contingency from real orders as they move upstream.

Naylor et al. (1999), maintain that the positioning of the decoupling point depends upon the longest lead-time an end-user is prepared to tolerate and the point at which variability in product demand dominates. The lean paradigm, according to Naylor et al. (1999), can be applied to the supply chain upstream of the decoupling point because the demand is smooth and standard products flow through a number of value streams. Christiansen et al. (2007) discuss that the purpose of the lean philosophy, inspired by the Japanese production management concept, is to reduce all kinds of waste (inventory, unutilized capacity, bad quality, obsolete, extra time, etc.), in order to minimize cost. Lean strategy can be interpreted as Porter’s (1985) cost-effective strategy. Building on the concept of lean supply, Reichhart and Holweg (2007b) introduced lean distribution which is essentially the extension of the demand-driven “pull” signal downstream from the factory to the final customer, in order to build products only when the customer demands them. In this way, they challenged the mainstream focus of the time in the SCM literature on manufacturing operations. Their main premise was that the philosophy of contemporary lean thinking could be summarized as maximizing the relative value delivered (considering varying consumer preferences) by reducing waste and thus operational costs.

From Naylor et al. (1999)’s view, the agile paradigm must be applied downstream from the decoupling point as demand is variable and the product variety per value stream has increased. According to Christopher and Towill (2000), the aim of agile supply chain should be to carry inventory in as generic a form as possible (i.e., standard semi-finished products awaiting final assembly or localization). They refer to postponement as a vital element in any agile strategy. In this regard, while postponement allows the supply chain to keep

forecast-driven products in generic form longer by increasing speed and moving the decoupling point upstream, it allows the supply chain to create flexibility (Stevenson & Spring, 2007). The combination of “lean” and “agile” approaches at the decoupling point for optimal SCM is sometimes referred to as “leagile” (Bruce, Daly, & Towers, 2004; Mason-Jones et al., 2000). According to Naylor et al. (1999), postponing the decoupling point reduces the risk of being out of stock for long periods in retailing, and of holding too much stock of products that are not required. Most importantly, they claim that postponement is also essential where products have, or are likely to have, a short life cycle as in fast fashion environments such as in Benetton or as in computer manufacturing. In this way, postponing product differentiation reduces the risk of both stock-outs and holding excess stocks (Davis, 1993). However, although moving the decoupling point downstream provides flexibility benefits and reduced uncertainty, there is a trade-off with efficiency (Stevenson & Spring, 2007). In a study of Volvo Cars, Fredriksson and Gadde (2005) explain that if Volvo Cars had moved the decoupling point all the way upstream, it would have destroyed the economies of manufacturing.

Postponement Types

Various types of postponement have been discussed in the literature. Alderson (1950)'s original work started off by discussing time, identity, and form. Over the years, postponement has evolved to cover areas in addition to distribution, and researchers have explored several sub-types of the earlier types introduced by Alderson. Zinn and Bowersox (1988), for instance, count four types of form postponement, along with time postponement. Pagh and Cooper (1998) expanded this view by focusing on logistics and manufacturing types of postponement [and speculation] and proposed a 2x2 matrix of configuration of strategies resulting in a combination of the two types.

Form Postponement

Form postponement holds that the final formation or manufacturing of products (labeling, packaging, assembly, or even design) could be delayed until a better demand or market information is gained, or even until customer orders are placed (Pagh & Cooper, 1998). Therefore, products could be kept in a semi-finished state which avoids hefty costs of finished product holding inventory and obsolescence. In other words, firms can avoid the risk of having inventory at the wrong location due to errors in demand forecasting (Zinn & Levy, 1988). This could result in customizing products suitable for specific market segments or geographical spread (Lee, Billington, & Carter, 1993). Form postponement enables firms to adopt a build-to-order (BTO) or make-to-order (MTO) strategy (Gunasekaran & Ngai, 2005). As shown in Figure 6, by positioning the

decoupling point upstream or downstream, these strategies could be graphically illustrated using a “flows” metaphor.

Time/Place Postponement

The time of shipment and the location of final product processing offer alternatives to anticipatory distribution (Zinn & Bowersox, 1988). In this way, by placing inventories in distribution centers closer to the market, rapid deliveries to orders could be fulfilled without incurring the cost of excessive inventories further downstream – say on store shelves. Alderson maintains that a vast majority of the advancements in marketing – or what is recently discussed in SCM – is rooted in applying postponement, such as in rapid inventory turnover in retailing. Therefore, this type of postponement is closely related to, and dependent on logistics initiatives such as integration. It leads to reduction or elimination of the anticipatory nature of logistics since products are distributed directly to retailers or consumers (Pagh & Cooper, 1998). Cox and Goodman (1956: 55) refer to centralized distribution by “The Principle of Massed Reserves” in marketing, and assert that since aggregate stocks can be smaller when they are centralized than when they are dispersed, they reduce the cost of storage because “fluctuations in the flows into and out of individual establishments offset each other to some extent”. Of course, a complex question arises as to determine the optimum number and location of distribution centers (Feitzinger & Lee, 1997).

Zinn and Levy (1988) consider JIT systems as the extreme case of such postponement. However, Waller et al. (1999) argue that postponement and JIT could be mutually exclusive in some cases. They use retail firms that keep only displays in their outlets and hold several months of inventory in their warehouses as examples of firms which practice postponement but not JIT because of the large amounts of inventory. Similarly, they discuss that when products are made to inventory but only in anticipation of daily demand (such as in Toyota manufacturing plants), JIT is applied but not postponement.

Other Types

Over the years, postponement has evolved both practically and academically. Yang et al. (2004b) add product development and purchasing (originating from Alderson (1950) to the much discussed postponement types. van Mieghem and Dada (1999) introduce price postponement. In that case, for instance, by delaying the pricing decision until a better demand information is realized (price postponement), firms can use price as a response mechanism to change demand so that the modified demand is better matched with the fixed supply (Tang, 2006). Kiesmüller, de Kok, and Fransoo (2005) discuss transportation mode [selection] postponement. There is much potential in further developing Alderson’s idea of identity postponement. Still typologies of postponement are encouraged to include broader areas such as service processes beyond

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distribution and logistics (Boone et al., 2007; van Hoek, 2001). Another type of postponement which has been underdeveloped in the literature could be labelled “financial postponement”. Take for instance Zara, which is widely-used as a text-book example for “classic” types of postponement. They allocate new stock to stores every other week which encourages more frequent shopper visits. This is enabled by quick response (QR) methods and only committing up to 20% of their buying budget six months in advance of the season with the commitment increasing to 50% by the start of the season. As a result, Zara’s flexibility improves in allocating the remaining 50% of the budget in order to react to the latest fashion trends (Ferne, Sparks, & McKinnon, 2010).

Perhaps, the most significant notion brought up by Alderson’s original work, which has not been given its due attention, is the linkage between postponement and the development of self-service. He takes the example of the food markets that evolved from home delivering groceries to allowing shoppers into the stores and engaging them in sorting. In this way, instead of incurring the burden of stocking groceries in home larders, shoppers were encouraged to hand-pick fresh items and assemble their own orders in stores, perhaps more frequently. What he labels “purchasing postponement” for the shopper has some important implications. First, the delivery activity for the retailer could be eliminated by avoiding “differentiation” for every household and stocking a convenient assortment in the store. So, for the retailer, several risks are shifted further downstream to other actors (i.e., the shoppers). Second, from a shopper’s point of view, the purchasing activity is postponed until the latest possible time, or perhaps a more convenient time, or whenever fresh items are needed. Therefore, for both “the size of working stocks”, as well as some risk and uncertainty costs are reduced.

Postponement and Customization

Customization, in simple terms, is the extension of options and characteristics of a product, and postponement or delayed configuration is considered the key to it (Feitzinger & Lee, 1997; Waller et al., 2000). In fact, the growth in postponement is partially ascribed to reflect the increased demand for customized products (Boone et al., 2007). Postponement is regarded as an operational and organizational concept that is used to achieve customization (van Hoek, 1998a; van Hoek, 2001). In a global context to achieve customization, according to Cooper (1993), postponement could be applied for specific markets depending on whether the brand is global, the formulation, and the peripherals (labels, packaging, and instruction manuals) of the product is common for different markets or not.

Customization and postponement have sometimes even been used interchangeably in the literature; nevertheless, the majority of scholars have regarded customization as an outcome or manifestation of postponement. However, van Hoek (2001) argues that customization could be realized through

other methods than postponement as well. For instance, he points to the cases where customization is embedded in the product such as in software products and Lycra custom clothing, or when customization is achieved through “services only, not impacting manufacturing or distribution of the physical product”. The latter argument seems to stem from Pagh and Cooper’s (1998) dichotomy in being goods-centric and is in contradiction to the more recent paradigm in marketing of Service-Dominant Logic (SDL) (Lusch & Vargo, 2006; Vargo & Lusch, 2004). Waller et al. (1999) touch upon the same issue by discussing that postponement and customization should be both viewed in a spectrum. They exemplify cases such as the French nuclear reactors in which a firm offers one standard product with no variations (which they refer to as no customization), but manufacturing and assembly is postponed until an order is placed. However, one can argue that in such instances, other postponement types such as place postponement might be used in relation to the components. The problem seems to stem in different viewpoints on postponement and customization and considering them as only having “zero and one” extremes. However, even customization has been widely discussed as having several levels.

The term “mass-customization” was coined by Davis (1989) where he proposed that by making use of technology, it could be economically feasible to “mass produce” customized products, services, markets, and even organizations. He argued that in any of the cases, each is understood to be both part (customized) and whole (mass) simultaneously. Later, the concept was further developed by Pine II (1993a) into a business concept. Mass customization, in his view, relates to the ability to provide individually designed products and services to every customer through high process flexibility and integration (Da Silveira, Borenstein, & Fogliatto, 2001). In this regard, Kotler (1993) maintains that in mass customization, new technologies pave the way for going back to tailoring goods and services for customers affordably on an individual basis to deal with the challenge of long lead times associated with pure conventional customization. Mass customization has been identified as a competitive strategy by an increasing number of companies (Da Silveira et al., 2001). However, it has not proven to be the key to success for every supply chain. Obviously, of the caveats to mass customization are unique operational capabilities (Zipkin, 1997), and cost. Feitzinger and Lee (1997: 116) discuss that although some companies in such industries as paint and consumer electronics have succeeded in dramatically increasing their product variety through product and process modularization and postponement significantly reducing the time to fulfill customers’ orders and reducing costs, some other companies have not. They have “mass-customized only to see their costs soar out of control”. Huffman and Kahn (1998) pinpoint the downsides of offering too many options to customers. They maintain that retailers that implement a high variety strategy need to ensure that customers are not confused with the complexity inherent in a wide assortment of options.

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Other concepts and terms similar to customization are personalization (Peppers, Rogers, & Dorf, 1999), and individualization (Imhoff, Loftis, Geiger, & Imhoff, 2001). Vesanen (2007)'s comprehensive study shows that personalization is performed by the firm while customization is performed by consumers. They contend that moving from personalization to customization, the level of interaction and collaboration increases. Piller et al. (2004) differentiate customization with mass customization based on the extent of the "willingness to pay". In the case of customization, for instance, they state that in the sports shoe market, Adidas can charge higher premiums for its customized sports shoe brand "mi adidas" (up to 50%) compared to the customized shoes of Nike (between 5% and 10%). Adidas not only offers a choice of numerous colors, but also to customize the shoes with regard to comfort, fit (exact measurements) and functionality (cushioning etc.). In contrast, Nike limits customization to the design (selection of color options). Piller et al. (2004), further argue that only if the premiums asked for the customized solution do not lead to a change of market segments compared to providing the product in a mass production system, it can be referred to as mass customization. Wind and Rangaswamy (2001: 14) propose "customerization" as the next stage of evolution of mass customization. They define it as "a buyer-centric company strategy that combines mass customization with customized marketing which is highly IT-sensitive". The difference, as they see it, is that mass customization is IT-intensive on the production side, whereas customerization is IT-intensive on the marketing side. They contend that customerization is more than mass customization in the sense that there is even no need for having manufacturing capabilities. Wind and Rangaswamy (2001) take the example of the retailer garden.com which is extremely successful in creating customized products and delivering unique shopping experience. Surprisingly, the retailer does not own any nurseries nor does it take delivery of plants. The delivery is operated by logistics service providers such as FedEx and UPS. Hence, the authors discuss, the distribution channel is also becoming more customerized.

Nevertheless, the other side of the coin in any customization scenario is that in an environment where the demand volume is difficult to predict, the composition of demand would also be difficult to predict due to the vast number of options available to customers. This would be amplified in cases where the nature of the demand is heterogeneous such as in fast fashion retailing and computer equipment manufacturing. The cases of HP and Benetton (Dapiran, 1992; Feitzinger & Lee, 1997) show how postponement can help manage the uncertainties in the demand and meanwhile be successful in mass-customization.

2.4 Logistics Integration

Logistics is typically seen as having an integrative and boundary-spanning role in that it focuses on coordinating activities between functions that can provide desired levels of support to the customer at the lowest total cost (Gustin, Stank, & Daugherty, 1994). Logistics, which provides time and space utilities, is dependent upon information systems and computer technology to facilitate collaborative planning, support operations, and control real-time information throughout a firm's supply chain (Vickery, Jayaram, Droge, & Calantone, 2003). Integration and synchronization are believed to be the keys to responsiveness. Synchronization implies that each entity in the network is closely connected to the others and that they share the same information (Christopher, 2011: 227). Mentzer et al. (2001) classify SCM activities into integrated behavior, mutually sharing information, mutually sharing risks and rewards, cooperation, integration of processes, having the same goals and focusing on serving customers, and building and maintaining long-term relationships.

Collaboration between retailers and their suppliers has been ongoing for decades, but in recent years, the level of complexity and coproduction of competitive advantages have reached new heights. Retailers must not only balance returns on assets, growth, and inventory turns but also develop strategic approaches in collaboration with their supply chain partners to drive demand (Ganesan et al., 2009). Initiatives such as Electronic Data Interchange (EDI), ECR, and general models such as the Supply Chain Operations Reference (SCOR), all stress the weight of the attention given to integration in SCM literature and practice, to the extent that SCM is seen equivalent to integration by some scholars (see Lambert, Cooper, & Pagh, 1998). For instance, ECR, which could be seen as an extension of the Vendor Managed Inventory (VMI) concept (Kaipia & Tanskanen, 2003), on the supply side, is concerned with mechanics of supplier integration, where its remit extends from improved forecasting, through sales-ordering, to cross-docking and the introduction of continuous replenishment. On the demand side, ECR covers new product development (NPD) and introductions, trade and consumer promotions and all aspects of Category Management, including product ranging and store assortment (Christopher & Peck, 2003: 96). These systems are ideally meant for replacing inventory with perfect information (Chen & Paulraj, 2004a; Paulraj, Chen, & Flynn, 2006). On a broader scale, Rai et al. (2006: 229) consider supply chain process integration as “the degree to which a focal firm has integrated its physical, financial, and information flows with its supply chain partners”.

Logistics integration refers to “specific logistics practices — operational activities that coordinate the flow of materials from suppliers to customers throughout the value stream” (Stock et al., 2000: 535). Fabbe-Costes and Jahre (2007) discuss four intertwined layers of logistics integration; namely, of flows

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(physical, information, financial), of processes and activities, of technologies and systems, and of actors (structures and organizations). Several time-based and overall firm performance outcomes have been documented to be resulting from logistics integration practices (Braunscheidel & Suresh, 2009; Droge et al., 2004; Paulraj & Chen, 2007a, b). Besides reducing the costs in activities such as customer service, transportation, warehousing, inventory management, order processing, information systems, production planning, and purchasing, logistics integration helps to minimize the build-up of inventory at critical business interfaces while improving transport and warehouse asset utilization and eliminating duplication of efforts (Gustin, Daugherty, & Stank, 1995).

This is of utmost importance, especially, in retailing and SMEs where logistics costs represent a considerable part of the total interface cost between retailers and their suppliers (Caputo & Mininno, 1996; Gélinas & Bigras, 2004). Specifically, retailers look beyond their organizational boundaries to evaluate and integrate the resources and capabilities of their suppliers and customers, and thus, create superior value and a competitive advantage that they might sustain over time (Ganesan et al., 2009). Operationally, by integrating their operations and using linking technologies with their suppliers, retailers attain a higher level of flexibility to react to changes in customer demand, and minimize mismatches in demand and supply, preventing expensive waste of inventory and effort (Richey et al., 2012). Moreover, it is widely accepted that integrating operations with suppliers and customers is of strategic importance (Frohlich & Westbrook, 2001).

Scholars have called for further attention to both inter-departmental and inter-organizational integration (Kahn & Mentzer, 1996; Stank, Daugherty, & Ellinger, 1999). In an inter-organizational context, Caputo and Mininno (1996) study logistics integration at three levels: within each firm (internal integration), between businesses located at different stages of the channel (vertical integration), and between different businesses located on the same level of the channel (horizontal integration), which resembles the concept of “linkage” in Porter’s (1985) value chain. Hence, it can be viewed at different levels and scopes including dyadic, triadic, or network. The external integrations involve core competencies related to coordination with customers and suppliers (Flynn, Huo, & Zhao, 2010). Frohlich and Westbrook (2001) propose the “Arcs of Integration” model which underlines the direction (upstream or downstream) and extent (degree) of integration in a supply chain setting. High levels of process integration across firms are characterized by greater coordination of the firm’s logistics activities with those of its suppliers, and blurred organizational distinctions between the logistics activities of the firm and those of its suppliers (Stock et al., 2000). Logistics integration could be extremely resource consuming and does not happen overnight. Stevens (1989) discusses integration at strategic, tactical, and operational levels, and proposes a gradual multi-phase approach for integrating in supply chains. It is due to this complexity that operationalizing and investigating the effect of integration on performance

becomes a daunting task. In fact, after a systematic study of the literature, Fabbe-Costes and Jahre (2008) suggest that the positive effect of integration on higher performance be taken with caution.

2.5 Performance

SCM scholars have, generally, regarded performance measurement and analysis a complex and daunting task. Various approaches have been taken to measure performance. Regarding the nature of measurement, both qualitative and quantitative measures have been considered in this respect. Beamon (1999) criticizes qualitative evaluations for being vague and difficult to utilize, and calls for using quantitative measures. Generally, most of the research addressing performance deals with self-reported subjective evaluations of performance by decision-makers. Meanwhile, Ketokivi and Schroeder (2004) draw attention to the bias associated with solely relying on perceptual measures of performance.

Another area of discussion in performance measurement pertains to the level of analysis. Strategic, tactical, and operational measures have been widely studied considering both the firm and supply chains as level of analysis (Gunasekaran, Patel, & McGaughey, 2004). For instance, Lambert and Pohlen (2001) propose a framework which integrates the interfacing customer relationship management and supplier relationship management processes at each link in supply chains. Meanwhile, much of the SCM research carried out at the firm level deals with firm performance instead. Kroes and Ghosh (2010) regard supply chain performance as antecedent to business performance in cases where both are considered. Similarly, van Hoek (1998b) argues that a performance measurement framework should include the aspects of firm contribution overall supply chain competitiveness.

Finally, a major concern among SCM and management scholars is how to operationalize performance. Some call for the efficiency and effectiveness dichotomy. Efficiency refers to the ratio of resources utilized against the results derived, while effectiveness pertains to the extent to which outcomes and goals are achieved and accomplished (Mentzer & Konrad, 1991). Building on this conception in a logistics setting, Fugate, Mentzer, and Stank (2010) argue for including differentiation – pertaining to time-related issues – to efficiency and effectiveness, based on the contention that a firm with inimitable logistics activities can create value and differentiate itself from the competition. Along similar lines, another prevalent categorization of firm performance is considering the three dimensions of market or strategic (related to competitive advantage, customer satisfaction, brand equity, etc.), operational, and accounting or financial. Operational performance relates to operational efficiency, flexibility, quality, and speed, while accounting-based performance relates to overall profitability as indicated by return ratios, earnings, and profit (Golicic & Smith, 2013), which are in line with the primary standard criteria

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found in balanced scorecard approaches to measuring performance (Kaplan & Norton, 1996). Other “balanced” approaches include dimensions pertaining to finance, customer, internal business process, and learning and growth (see Bhagwat & Sharma, 2007).

Gunasekaran, Patel, and Tirtiroglu (2001) analyze performance measures and metrics based on whether they relate to operational, tactical, or strategic levels, which could either be financial or non-financial. In their framework, most of the performance measures fall under the non-financial category. Following a similar pattern, Table 1 provides an overview of some performance measurement contributions related to strategic, operational, and financial aspects.

Table 1 Firm Operational, Strategic, and Financial Performance

Author(s)	Performance Measure		
	Operational	Strategic	Financial
Venkatraman and Ramanujam (1986)	– Organizational Effectiveness		– Primary and Secondary
Tan, Kannan, Handfield, and Ghosh (1999)		– Overall Quality – Competitive Position – Customer Service Level	– Sales Growth – ROA – ROA Growth – Market Share – Market Share Growth – Production Cost
Frohlich and Westbrook (2001) Narasimhan and Kim (2002) Flynn et al. (2010)	– Flexibility		– Return on Sales – Sales Growth – Growth in Return on Sales – Profit Growth – Market Share Growth – ROI – ROI Growth
Vickery et al. (2003)	– Responsiveness – Delivery Speed – Delivery Dependability – Product Support – Pre-Sale Customer Service		– Pre-Tax ROA – ROI – Return on Sales
Wisner (2003)		(Relative to Competitors): – Overall Quality – Competitive Position – Customer Service Level	– Market Share – ROA

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Min and Mentzer (2004)	– Availability – Timeliness	– Offerings	– Profitability – Growth
Devaraj, Krajewski, and Wei (2007)	– Returns Percentage – Defects Percentage – Delivery Speed – Inventory Returns – Flexibility – Production LT		– Production Costs
Akyuz and Erkan (2009)	– Agility – Flexibility – Information Productivity	– Development of Partnership – Collaboration	
Fugate et al. (2010)		– Global Reach	– Market Share Growth – Sales Growth – Return on Sales – ROA – ROI – New Product Sales Percentage of Total Sales
Kristal, Huang, and Roth (2010)			– ROI – Net Profit – Return on Sales – Sales Growth – Market Share
Kroes and Ghosh (2010)			– Profit Margin Percentage – Return on Sales – ROA – Sales over Assets
Cao and Zhang (2011)			– Sales Growth – Profit Margin – ROI – ROI Growth
Merschmann and Thonemann (2011)			– Return on Sales – Sales Growth
Leuschner, Rogers, and Charvet (2013)	– Cost – Quality – Delivery – Innovation – Flexibility	– Customer-Oriented Measures	
Dubey, Singh, Samar Ali, Venkatesh, and Gupta (2014)	– Customer Satisfaction		– ROA – Profitability

2.6 Configuration Theory Approach

Organizational configurations can be defined as commonly occurring clusters of attributes of organizational strategies, structures, and processes (Ketchen, Thomas, & Snow, 1993: 1278). Critically building on contingency theory, Miller and Friesen (1977, 1978) proposed a “rather unorthodox” methodology for identifying “archetypes” based on contextual strategy making in organizations. They argued that the then-existing taxonomy studies should go beyond looking at “over-simplified” bivariate linear, and simple “if-then” relationships between contingency variables to include “a fairly large number of variables” in a parsimonious way.

Configurational research is unique in the sense of its approach to the primary goals of organizational research; namely, description, explanation, and prediction (Short, Payne, & Ketchen, 2008). These “constellations of mutually supportive elements” are conceived of being predictively useful in identifying particular performance outcomes (Miller, 1986). The notion that performance differences is attributed to configurations is grounded in structural contingency theory and is well empirically examined through qualitative and quantitative research (Ketchen et al., 1997). According to the contingency theory, firstly, there is no best way to organize, and different organizational arrangements are valid for different strategic conditions (Hill & Birkinshaw, 2008); and secondly, firms whose configurations are aligned with their environment should perform better than firms in nonaligned configurations (Ketchen et al., 1993).

Configurational research has appeared under various concepts and labels, such as taxonomies, typologies, gestalts, or archetypes, which has led to much semantic confusion. Short et al. (2008) call for distinguishing between the labels depending on the basis for identifying configurations (either competitive strategy or organization features) and applicability of organizational configurations (being context-specific or generalizable). They highlight the difference between typology and taxonomy in the sense that, generally, typology refers to a conceptually driven classification scheme, which according to Doty and Glick (1994), do not provide decision rules for classifying organizations; whereas, taxonomy refers to an empirically generated classification. Nevertheless, these terms have been widely used interchangeably.

The development of configurations, typologies and taxonomies is fundamental to management research, and is particularly useful when the research goal is the determination of the dominant patterns in organizations, or when the relationships between individual variables are either poorly understood or too complex to be modeled using traditional approaches (Zhao, Sum, Qi, Zhang, & Lee, 2006). In this modeling, the configurational approach yields not only practical insights for managers but also “a systematic, detailed, and holistic image of reality, without attributing causation to any of the individual parts of the model” (Ward, Bickford, & Leong, 1996). In this regard,

an ongoing concern of scholars in various management fields has been the adequacy of variables selected to identify configurations, and deciding on the level on which sets of defining variables should be applied within (e.g., industry, technology, market, etc.) (Ketchen et al., 1997).

SCM scholars have embraced the configuration theory to define taxonomies of practices. Flynn et al. (2010) assert that the configuration approach is appropriate for handling complex relationships in SCM, and could overcome the possible reductionism of complicated phenomena in contingency approaches. Neher (2005: 77) maintains that the use of configuration approach in SCM helps develop the supply chain theory; meanwhile, by stressing the equifinality of solutions and outcomes, he highlights that “configurations are not ideal or normative models but patterns of cohesive elements linked to or expressed by a certain theme”. Das, Narasimhan, and Talluri (2006) carry out a configuration study on integration practices and maintain that although configurations exist, they may not be unique, and could differ based on specific industry and market environment. In a study on demand forecasting, Kalchschmidt (2012: 784) compares contingency and configurational approaches, maintaining that in contingency theory the premise is that the best practice depends on the contextual variables while configuration theory holds that “practices have synergetic effects and should be studied together”.

2.7 Resource-Based View (RBV)

The Resource-Based View (RBV) of the firm originated with the seminal work of Wernerfelt (1984) and the later developments of Barney (1991). Wernerfelt (1984) contends resources and products to be two sides of the same coin for firms; most products require the services of several resources and most resources can be used in several products, he argued. This paradigm is rooted in Penrose’s (1959: 25) idea that “services yielded by resources are a function of the way in which they are used – exactly the same resource when used for different purposes or in different ways and in combination with different types or amounts of other resources provides a different service or set of services”.

Firm resources, or competencies, include all tangible or intangible assets, organizational processes, firm attributes, information, technology, human capital, and knowledge, financial capital, and reputational capital controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness (Barney, 1991; Grant, 1991). In this view, firms are regarded to be “bundles of resources” which may have been developed inside the firm or acquired in the market. These resources are perceived to be valuable, rare, inimitable, and non-substitutable (i.e., resources with VRIN attributes) (Eisenhardt & Martin, 2000). Teece et al. (1997) labels those competencies that define a firm's fundamental business as core competencies

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which must accordingly be derived by looking across the range of a firm's – and its competitors – products and services.

Capabilities are “complex bundles of skills and accumulated knowledge, exercised through organizational processes that enable firms to make use of their assets” and function like a key success factors” (Day, 1994: 38). Therefore, capabilities refer to a “firm-specific” (Makadok, 2001) capacity to deploy resources (Amit & Schoemaker, 1993). As a result, the uniqueness of each firm lies in the way, or the configuration of, how they bundle resources and capabilities (Coates & McDermott, 2002). Bundling pertains to integration of resources for the purpose of developing capabilities which create value (Brandon-Jones et al., 2014). Stalk et al. (1992) trichotomize capabilities depending on the orientation and the focus of the defining processes. In their view, the capabilities that are deployed from the inside out and are activated by market requirements, competitive challenges, and external opportunities are on one side of the spectrum. On the other side, are capabilities, which mainly pertain to the outside of the organization. Finally, spanning capabilities are the ones needed to integrate the former capabilities. RBV explains how the rent generating potential of resources and capabilities can lead to sustainable competitive advantage, and is particularly suitable when the resources and capabilities are intangible and firm-specific (Barratt & Oke, 2007).

Resource-based explanations of firms and performance heterogeneity have been conceived of having the potential to be applied to important areas of logistics and SCM research (Olavarrieta & Ellinger, 1997). Supply chain capabilities and resources are the building blocks for supply chain strategy, and are potential sources of competitive advantage (Mentzer, Min, & Bobbitt, 2004; Morash & Lynch, 2002). Ketchen and Hult (2011) argue that supply chain identity could be considered as a valuable, rare, inimitable and non-substitutable resource could reduce cycle time. SCM scholars have argued that several logistics systems, including distribution, could be unique difficult-to-duplicate capabilities, which can be further refined and become more sophisticated by further use (Olavarrieta & Ellinger, 1997). Hitt (2011) maintains that resource management processes could be more complex in situations in which suppliers are external to the firm.

However, RBV has been criticized for its assumptions in analyzing sources of competitive advantage which holds that “... that these resources may not be perfectly mobile across firms, and thus heterogeneity can be long lasting” (Barney, 1991: 101). The main concerns relate to oversight of dynamism, environmental contingencies, and managers' role (Sirmon et al., 2007). Some scholars call for considering aspects of contingency theory in RBV in what is referred to as “contingent RBV” to address the static nature of the RBV (Brandon-Jones et al., 2014; Chae, Yang, Olson, & Sheu, 2014). Various scholarly works on flexibility and postponement are embedded in the RBV (Claycomb, Dröge, & Germain, 2005; Sawhney, 2006).

2.8 Summary

This chapter presented an overview of the literature and theories used in the dissertation. After an introduction of the issues of time and timing, logistics flexibility and postponement – which are the two main concepts in the dissertation – were overviewed. These two concepts are reviewed more in detail in Papers 1 and 2 through systematic literature reviews. The first two Papers in the dissertation specifically focus on defining the concepts of postponement and logistics flexibility, as well as reviewing how existing research has dealt with conceptualizing, typologizing, and measuring the concepts. These two Papers serve to answer the first Research Question discussed in Chapter 1 by paving the way for the two exploratory papers which follow them. The literature on logistics integration and performance were briefly presented mainly in relation to the issues that are addressed in Papers 3, 5, and 6. Papers 3 and 4 more specifically deal with RQ₁ and are mainly built on the literature reviews carried out and presented in Papers 1 and 2. Later, Configuration Theory, which is used as the main building block of Paper 5, was presented in this chapter. Paper 5 is clearly structured to address RQ₂. RBV, which was overviewed in this chapter along with discussions on competencies and capabilities, is frequently reflected upon in Papers 5 and 6. RQ₃ is meant to be addressed by Paper 6 which is based on the same quantitative dataset as Paper 5. Table 2 shows the concepts and theories overviewed in this chapter in relation to the papers in which they are addressed. The “schema” column intends to simply depict how the working conceptual model presented in Figure 2 is approached in the attached papers.

Table 2 Papers and Corresponding Concepts

Paper	RQ			Concepts and Theories						Schema		
	1	2	3	Postponement	Logistics Flexibility	Customization	SDL	Performance	Logistics Integration		Configuration Theory	RBV
1	x	x	x	x								(PP)
2	x	x	x		x			x				(LF)
3	x			x	x	x		x			x	(PP) → (LF) → (FP)
4	x			x		x		x				(PP)
5	x			x	x			x		x		(PP) → (LF) → (Log. Conf.) → (FP)
6		x		x	x			x	x		x	(Unc) → (PP) → (LF) → (FP) → (U)

3 Method

This chapter deals with discussions on the methods used in the dissertation. After an introduction on mixed methods, the overall study design of the thesis is presented. Later, the data collection processes in different strands of the study are explained. Operationalization of the constructs mainly used in the survey is summarized. Later, the systematic literature review processes of the first two papers are explained. Finally, quality issues overviewed.

3.1 Introduction

The overall purpose of this thesis is the main determinant of the method. Since the purpose is multi-folded, and the respective research questions consecutively build on one another, a mixed methods approach is appropriate. Therefore, a multi-strand sequential mixed methods is used in this dissertation. The two strands consist of two qualitative case study articles and two quantitative articles. In order to explore the application of postponement and logistics flexibility in retailing, and to investigate the resulting firm performance, it is needed to first determine what types both postponement and logistics flexibility have, and how they are measured. For this purpose, systematic reviews of the literature prove to be more suitable. The motivation for doing such reviews is the developments of the concepts of postponements and logistics flexibility, lack of consensus regarding measuring and analyzing them, as well as paucity of research regarding their application in the retailing context compared to manufacturing. Systematic reviews include thematic and typological analysis of the literature, and move beyond simple narrative reviews (Briner, Denyer, & Rousseau, 2009; Tranfield, Denyer, & Smart, 2003). These types of reviews, as opposed to conventional reviews, are perceived to increase clarity of scholarly communication, internal validity – mainly against selection bias – and auditability (Booth, Papaioannou, & Sutton, 2011). As a result, the two concepts will be identified and explored in a more valid fashion.

In order to address the first research question, the application of postponement should be further explored, as well as its connection to logistics flexibility. For this purpose, two qualitative case studies are carried out in the first strand. In the second strand, along with the discussion on the changes and complexity in the retail environment, especially in relation to logistics practices, the logistics configurations resulting from the application of postponement and flexibility are explored in a retailing context. Finally, as for investigating the consequences of postponement implementation on flexibility, the nature of RQ₃ calls for further statistical analysis. Hence, another motivation for having a mixed methods design in this dissertation. Also, it seems to be of high

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relevance to perform an industry-wide study in logistics-related issues in retailing, where the subject seems to be underdeveloped, coupled with case studies to both increase insight and generalizability (van Hoek, 1998a). From a practical standpoint, according to Johnson and Onwuegbuzie (2004), mixed methods research offers great promise for practicing researchers who would like to see methodologists describe and develop techniques that are closer to what researchers actually use in practice. The unified study design helps to cover the limitations of each strand of the study.

Surveys have an important share in logistics and SCM research (Kotzab, 2005). Reflecting on their retrospective analysis of the scientific methods in retailing research articles published in *Journal of Retailing*, Brown and Dant (2008) report that industry survey has been the dominant methodological approach by researchers working on channel issues (nearly 47%). Meanwhile, they discuss that the retail supply channel research could “take on a new life” by using different inferential tools than has been traditionally employed. Specifically, they call for applying qualitative research to study retail supply chains to uncover new problems. In postponement research, van Hoek (2001) saw methodological upgrading of postponement as a major challenge and called for the use of multi-method research efforts; especially, triangulation. Similarly, Mentzer and Flint (1997: 213) refer to triangulation as “the only way to thoroughly research any concept in logistics” as it lends greater empirical support to the theory in question. Boone et al. (2007) believe that methodological diversity could “attack” different types of research questions and also emphasize the need for triangulation, especially in research on postponement.

3.2 Mixed Methods

Mixed methods research has emerged as an alternative to the dichotomy of qualitative and quantitative traditions during the past two decades (Teddlie & Tashakkori, 2009). It has been referred to as the third research paradigm or methodological movement (Bryman, 2009; Tashakkori & Teddlie, 2003b). Johnson and Onwuegbuzie (2004: 17) define mixed methods research as “the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study”.

Philosophically, mixed research makes use of the pragmatic method and system of philosophy (Maxcy, 2003; Tashakkori & Teddlie, 2003b; Teddlie & Tashakkori, 2009). Tashakkori and Teddlie (2003a: 713) define pragmatism as “a deconstructive paradigm that debunks concepts such as truth and reality and focuses instead on what works as the truth regarding the research questions under investigation”. They maintain that a central premise in pragmatism is advocating for the use of mixed methods in research, and avoiding either/or

choices associated with paradigm wars, while underlining the role of researchers in interpretation of results. In fact, it is the epistemological and ontological flexibility of pragmatism that makes it the paradigm of choice for mixed methods (Greene, 2008). In general, several pragmatists claim that philosophical paradigms – specifically, the philosophical view disagreements between qualitative and quantitative research (i.e., constructivism vs. positivism) – are not determinant of research practices (e.g., Tashakkori & Teddlie, 1998). However, this view has been criticized for underestimating the actual influence of philosophical assumptions on research methods (Maxwell & Mittapalli, 2010). As a result, the ontological stance of this dissertation, would be taking diverse viewpoints regarding social realities in different strands of the study. For instance, the quantitative strand of the dissertation could be ontologically considered as what falls under critical realism, in a post-positivistic view, since it entails that “causal relationships exist outside of the human mind” and that that “these valid causal relationships cannot be perceived with total accuracy by the researcher’s imperfect sensory and intellective capacity” (Cook & Campbell, 1979: 29). From an epistemological standpoint, in line with the pragmatist view, both objective and subjective points of view are taken depending on the research strands. The logic of inquiry in this mixed methods includes the use of induction (or discovery of patterns), and deduction (testing of theories and hypotheses) in the two strands (Johnson & Onwuegbuzie, 2004). Hence, various types of logics are used in this study in different strands. It starts with inductive during the qualitative strand and is followed by deductive in the explanatory strand.

3.3 Study Design

Mixed methods designs have been around for decades and are perceived to be derived from the similar concept of triangulation. Denzin (2009) conceives of triangulation as involving varieties of data, investigator, and theories, as well as methodologies. He discusses the four basic types of triangulation as data (with these types: time, space, person, and levels: aggregate, interactive, collective), investigator (multiple vs. single observers of same object), theory (multiple vs. single perspectives in relation to the same set of objectives), and methodological (within-method triangulation and between-method triangulation). In this study, triangulation is applied in various forms: data (qualitative and quantitative, gathered in various time periods), investigator (involving several observers in the qualitative strand), and methodological (within each strand by using different scales, cross-case analysis and different data sources, and between qualitative and quantitative methods). In this way, the overall validity of the study would also increase. Meanwhile, one should note the potential shortcomings of triangulation, including replication and one method becoming far too rudimentary (see Jick, 1979).

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There exists a handful of typological classifications for mixed method designs which are mainly based on criteria ranging from number or priority of methodological approaches to stage of integration of approaches (Creswell, Plano Clark, Gutmann, & Hanson, 2003; Johnson & Onwuegbuzie, 2004; Morse, 2003; Tashakkori & Teddlie, 2003b; Teddlie & Tashakkori, 2009). Stages of a study are steps or components of a strand or phase of a study. Strand of a research design is a phase of a study that includes conceptualization, experiential (methodological/analytical), and inferential stages (Ridenour & Newman, 2008).

This thesis could be labeled as a Sequential Mixed study, in which, partly, data collection was gathered in parallel. These types of studies involve at least two phases that are carried out successively. In the thesis, based on the systematic literature reviews, a qualitative strand consisting of two articles was followed by a quantitative strand including two articles. This variation of mixed methods design is specifically useful for typology development through which the analysis of one data type results in a typology – or groups of attributes or themes – which is then used as a framework for analyzing the contrasting data (Caracelli & Greene, 1993). The two strand design is shown in Figure 8.

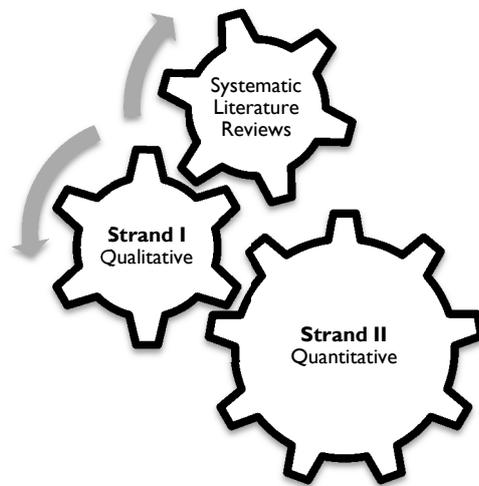


Figure 7 Connectedness of the Study Strands

The motivation for using such a design is rooted in the nature of the research problem and purpose. First of all, systematic literature reviews are carried out to identify different types of postponement and logistics flexibility. The results are used as inputs to the strands of the mixed design in order to increase validity. The conceptualization stage of this study was initiated in mid-2009 as part of a research project financed by The Swedish Retail and

Wholesale Development Council (HUR)³ where a working research purpose was developed. This project was carried out over a period of 2.5 years with a team consisting of three researchers⁴. Systematic literature reviews were carried out to identify the themes in the literature on postponement and flexibility, along with primary contacts with case companies. Initial qualitative data collection was done during this period, while the survey instrument for the quantitative phase was developed and refined.

The first strand of the study, which is of exploratory substance, consists of two qualitative case study articles. Each of the papers includes three retailers. The qualitative case studies were carried out to identify the practices and characteristics of retailers representing the clusters leading to developing propositions. Increasingly accepted, “why” and “how” research questions can be approached effectively using a case study method and also “what” questions can be answered by exploratory research with the goal of developing a basis for further research (Yin, 2009). A case study method enables researchers to develop a better insight into a complex and relatively unexplored phenomenon, which is being implemented only recently and is expected to increase rapidly in use (van Hoek, 1997). Specifically, in logistics research, Ellram (1996) lists a set of items which should be covered in any case study protocol (see Figure 9). These items are addressed in the articles.



Figure 8 Case Study Protocol

Source: Based on Ellram (1996)

Jick (1979) contends that qualitative data and analysis function is “the glue that cements interpretation”. The use of qualitative case study for the qualitative strand of the thesis is relevant since it serves the purpose of the study. In order to understand how postponement is actually being used by retailers and given the unrivalled recent changes in retail supply chains, qualitative case study seems to be most relevant. Primary data collection was done through semi-structured interviews with three retailers active in Sweden. The second study which deals with customization in retailing relies on primary and secondary data from interviews and netnography. In designing the interview guide, the types of postponement and logistics flexibility identified in the systematic literature reviews were used.

The results of the two case study papers served as complementary inputs to Strand II of the study. Furthermore, in Strand II several variables from a survey

³ Handels Utvecklingsråd

⁴ Anna Nyberg (Stockholm School of Economics), Susanne Hertz (Jönköping International Business School), and the author

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were used to explain the relationships and causal effects between the constructs via statistical techniques. Since the second strand of the study includes two articles (Papers 5 and 6). Paper 5 which addresses RQ₂ is of exploratory nature and uses cluster analysis to identify taxonomies of retailers. Here, applying the quantitative data resulting from the survey, postponement and logistics flexibility were used to explore the logistics configurations of retailers through clustering. Cluster analysis is widely used as a purely empirical classification tool for identifying groups in exploratory and inductive studies (Punj & Stewart, 1983). For testing whether the identified clusters differ regarding various measures of performance, multivariate analysis of variance (MANOVA) was used. Paper 6 involves testing several cause and effect relationships between various constructs; therefore, a multivariate technique was adopted (see Kaplan, 2008). In this paper, the main part of the analysis is carried out by applying structural equation modeling (SEM). SEM is a multivariate technique that combines aspects of factor analysis and multiple regression that enables examining a series of interrelated dependence relationships among the measured variables and latent constructs as well as between several latent constructs (Hair, Black, Babin, & Anderson, 2010: 634). Application of SEM in SCM research has increased in an unprecedented manner (Narasimhan & Jayaram, 1998; Wallenburg, 2009). Wallenburg and Weber (2005) maintain that the use of SEM can bring logistics research to a more sophisticated level. In a comprehensive analysis of the articles published in *Journal of Retailing* from 2004 to 2009, Brown and Dant (2009) conclude that, as an analytical tool, SEM has been widely used in articles applying Social Exchange (mostly related to channels, services, and SCM) and marketing theories (52% and 30.3% respectively). Finally, the results from the two strands were used in the “Meta Inference” phase to address the overall purpose of the thesis (Figure 10).

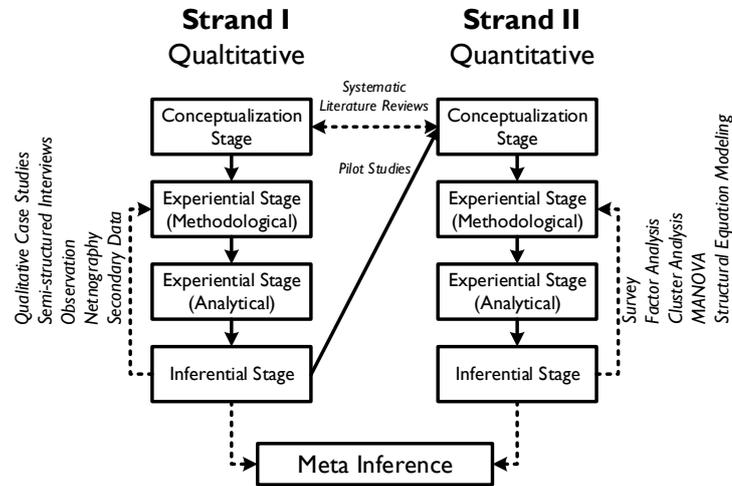


Figure 9 Sequential Mixed Design

3.4 Data Collection

In this thesis, an array of data collection methods were used in the empirical studies. The data collection process in each strand is explained below.

Strand I

The case studies in Papers 3 and 4 serve RQ₁ and focus on the instances of the application of postponement – and its manifestation, customization – in retailing, as well as trying to find connections to logistics flexibility. The unit of analysis in these studies is retail firms; however, in both papers, other upstream and downstream actors in the retailers’ supply chains were also considered for gaining further insight. The reason is that, from a SCM perspective, retailing cannot be seen in isolation. In Paper 4, the focus is not on retailers per se, but rather on the process of customization, so as to shed light on how postponement is applied.

Case selection as “the most important methodological decision” and cases can serve as important complements to quantitative research, testing theories in concrete instance, and helping to refine their scope of applicability (Dubois & Araujo, 2007). In Strand I, “purposeful and convenience sampling” was used to select the empirical cases (Patton, 1990), which are further explained in the papers. In Paper 3, with the start of the HUR project, it was intended to select “extreme/deviant”, “crucial cases”, “maximum variation”, and “critical” cases, since these are widely regarded as useful criteria (Flyvbjerg, 2006; George & Bennett, 2005). Following this framework, the cases chosen for Paper 3 were

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selected mainly regarding their different product type, range and categories, retail format, integration and ownership, and uncertainty. Also, convenience was taken into consideration in case selection, in the sense that some of the existing established personal connections from the previous case companies at CeLS⁵ were initially contacted.

The case companies selected, namely, Media Markt, Jysk, and Lidl carry different product categories in consumer electronics, home furniture, and grocery, respectively. All three firms are Europe-based and are widely active in Scandinavia. Regarding their types and product ranges, they could be classified as “general merchandise retailers” (and possibly category killers) with SNI codes 474 and 475 and “food retailers – limited-assortment supermarkets” with SNI code of 472. Media Markt, to a great extent, operates locally, while Lidl operates rather centrally and regionally. Jysk falls in the middle of the two extremes.

Primary data was collected through a total of 12 semi-structured interviews with key informant decision-makers within logistics and purchasing, warehousing and IT, and store managers in Sweden and Denmark. Primary data was collected over a period of two years from 2010 to 2012. By means of “snowballing”, the interviewees were asked to possibly recommend informant colleagues for further interviews. Also, archival material including financial reports, white papers, and internal reports were used as secondary data. Financial information was extracted from the Amadeus database⁶. Moreover, direct observations and field visits of operations and practices at distribution centers were done in order to gain perspective on the flow of goods, assortment, and the existing operating structure (see Ellram, 1996). Some other upstream actors were considered to gain more insight on logistics processes. One key supplier (LG Nordics) was introduced by Media Markt for further reference and the Scandinavian Supply Chain Director was interviewed. Also, data collected from four main third party logistics service providers (TPLs) and carriers serving these retailers (including Schenker, Aditro, Bring, and PostNord) were included. A total of 11 interviews⁷ with these TPLs were considered as secondary data to complement the primary data collected from the retailers. These interviews were carried out in 2009 to 2012 mainly for a project regarding customer value creation and innovation⁸. The interviewees within these TPLs held positions such as Key Account Manager, Sales and Marketing Manager, and Operations and Logistics Manager. All interviews were semi-structured and an interview guide was sent to the interviewees before the meeting. Each meeting took about one hour. The interviews were digitally recorded for further transcription and coding. Follow-up questions as well as

⁵ Center of Logistics and Supply Chain Management, Jönköping University

⁶ Bureau van Dijk

⁷ All interviews carried out by Lianguang Cui. The interviews with PostNord and Aditro were done by the author.

⁸ Global SCM project financed by VINNOVA

interview transcriptions were emailed to the respondents later for comments, corrections, and approval. The empirical data gathering was conducted in Sweden and partly in Denmark.

In Paper 4 data were collected on both retailer's and consumer's sides to explore the process of customization. Data collection started in 2011 by interviewing Bike by Me in Stockholm. Later, in Spring of 2012 two master's students⁹ were encouraged to gather more empirical data on bicycle customization for their thesis. The Germany-based myownbike was suggested to the students. Later, by identifying bicycle retailers which provide highly customized products, have an innovative business idea, and involve consumers in various value-creating activities, 718 Cyclery in the US was selected as well. In this regard, all cases were selected due to geographical reach and convenience, as well as their business concept. In addition, to the fact that Germany has the highest bicycle production and sales volume in the EU (COLIBI, 2013), data collection on myownbike was done in German since one of the co-authors was a native German speaker. Finally, 718 Cyclery perfectly fits with the "extreme" criterion on practicing a "collaborative" customization offering highly tailored bicycles, and was selected as the third case company.

On the retailer side, semi-structured interviews with the CEO's / owners were carried out covering the subject areas of business strategy, products and production, consumers, interaction and co-creation with consumers, supply chains, and market competition. The interviews were either in the form of a personal meeting or were conducted over the telephone and lasted between 40 to 70 minutes. The interviewees were later contacted for follow-up and clarifying questions through multiple e-mails. All interviews were recorded, transcribed, and emailed to the interviewees for confirmation. The interviews have been complemented by secondary material, such as company web pages and owner blogs.

On the consumer side, data collection was done via interviews and netnography. Interviews were conducted with buying and potential consumers who were mainly spotted and contacted via social media. Six such consumers agreed to participate in interviews. Moreover, seven actual buyers were observed through netnography. Netnography can be described as online ethnography (Kozinets, 2002). Where ethnography seeks to interpret the social world, netnography is used for identification and understanding of individuals' needs and behaviors by using information that is available in online communities (Kimmel, 2010). In addition, a sample of 19 individuals classified as "potential buyers", were interviewed. For convenience reasons and geographical proximity, some of these shoppers were interviewed face-to-face for 30 to 40 minutes. The rest were interviewed via telephone or online chats lasting between 15 to 25 minutes. The interview protocol covered issues pertaining to customization and co-design of bikes, and the reasons, and

⁹ Co-authors (Annika Schmitz and Tone-Lise Osnes)

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emotions associated with the experience in general and were not limited to any of the retailers. Open questions allowed the interviewees to express their general ideas and experiences, without restricting their responses to pre-defined choices.

All data was transcribed and coded in NVivo 10 following the respective theoretical frameworks in Papers 3 and 4. Choosing multiple cases, represents replications that allows for the development of a rich theoretical framework (Ellram, 1996). Yin (2009) also contends that, when it comes to cross-case studies, of the findings are likely to be more robust than having only a single case. He further appreciates the use of tables to display the data from the individual cases according to some uniform framework to pave the way for easier analysis. This procedure was taken into account here as well.

Strand II

In the quantitative strand of the thesis (i.e., Papers 5 and 6), primary data was collected via a cross-sectional telephone/online survey. Sweden was selected for the empirical context. Besides convenience reasons, first of all, all retail formats are available and active in Sweden, also, response rates in surveys in Sweden have proven to be higher than many other countries (Harzing, 2000). Moreover, the Swedish retail market has been growing for 14 consecutive years despite the financial downturn and is expected to grow by 30% until 2020¹⁰ (Invest Sweden, 2010).

Data collection was initiated with a pilot study of retailers, at the store level, in Jönköping city in 2011. Many reasons have been discussed by methodology researchers for the relevance of pilot studies. These reasons range from developing and testing adequacy of research instruments to estimating variability in outcomes to help determine sample size (see Teddlie & Tashakkori, 2009: 203). Information collected during these stages will be used to preliminarily assess the clarity and objectivity of the questions and the time needed to answer the questions (Rabinovich & Evers, 2003a). According to Hair et al. (2010), some type of pretest should be used to target respondents similar to those from the population to be studied so as to screen the items for appropriateness. In this study, through convenience sampling, 20 stores were selected. The earlier version of the survey consisted of over 60 questions. For this purpose, 20 student groups were asked to visit the stores in town and interview the store operators or managers regarding 4 product categories, resulting in 4 answers per store (a total of 80 responses). The aim was to understand whether or not there is a meaningful difference between various product categories each store carries in terms of the variables studied. The respondents were asked to answer the questionnaire, and to critically review and provide feedback if possible. Although for some stores, such as grocery

¹⁰ Based on the material from The Swedish Trade Foundation (Svensk Handel)

retailers, the difference was evident, for convenience reasons, it was decided to consider each firm as one “whole” constellation of categories rather than looking into the different categories they carry. This is in line with much of the mainstream research on retailing. The pilot study revealed that the instrument needed to be shortened and more tailored to the retailing industry, especially, since most of the established constructs were from manufacturing-oriented empirical studies. As a result, several variables that seemed redundant – especially after releasing the category considerations – were dropped including some product characteristics including lifecycle and range, which were initially suggested by Pagh and Cooper (1998). Also, five SCM researchers participated in pre-testing the measurement instrument.

The actual survey was done in 2012. In late 2011, contact information of the decision makers of retailers in Sweden was purchased from the PAR (Bisnode) agency which specializes in Scandinavian business contact information. The target sample frame consisted of the retailers listed on the Amadeus database drawn from firms covered under the three-digit Swedish Standard Industrial Classification (SNI 2007) codes including 471-477 and 479. Since the survey covered firm-level strategic constructs, high ranking SCM executives were used as potential respondents. This is in line with the unit of analysis of the study being retail firms. The title of the specific respondent sought was primarily vice presidents or directors of supply chain, logistics, purchasing, and/or retail were considered as potential respondents. In measuring the items, the study adopted a seven-point Likert scale with “strongly low” and “strongly high” as anchors. A seven-point Likert scale with end points of “strongly low” and “strongly high” was used to measure the items. A modified version of Dillman’s (2011) total design method was followed so as to increase the response rate. Potential respondents were contacted via telephone, and upon their request, those willing to participate were given the option to fill in the survey either via telephone or online by students¹¹. In case the person contacted was not well informed on the information needed in the survey, they were asked to refer the survey to the colleague they thought would be better informed. In the latter case, the link to the online version of the questionnaire was emailed to the respondent along with a cover letter. Within a period of two weeks, a reminder email was sent to the potential respondent. Secondary financial data was collected from the Amadeus database, as well as information regarding number of employees and secondary industry classification codes.

Of the 1000 firms contacted, 266 responses were received, resulting in a response rate of 26.6%. A total of 5 were discarded due to incomplete information, resulting in an effective response rate of 26.1%. The final sample included 104 presidents/vice presidents (39.8%), 98 SCM/logistics executives (37.6%), 34 purchasing executives (13.0%), and 25 others (9.6%). The respondents worked primarily for small to medium enterprises (SMEs) (49.8%).

¹¹ Peter Nendén and Avdyl Shala, and Retailing class of 2012

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Nearly 87% of the retailers had a turnover of less than €50 million. In Papers 5 and 6, 45 firms were excluded due to unavailability of objective financial data from Amadeus and therefore, the study was done on 216 firms.

Non-response bias was assessed using two approaches. First, the responses of early and late waves of returned surveys were compared to provide support of non-response bias (Armstrong & Overton, 1977; Lambert & Harrington, 1990). Along with 5 demographic variables, 25 other randomly selected variables were also included in this analysis. Depending on the dates they were received, the final sample was split into two groups – early wave and late wave. The early wave group consisted of 102 responses while the late wave group consisted of 159 responses. Group comparison tests performed on the responses of these two groups yielded no statistically significant differences (at 99% confidence interval). In addition, 250 retailers that had not responded were randomly selected from the list and data regarding their size (i.e., number of employees) was collected. Group comparison tests were performed and no statistically significant differences (at 99% confidence interval) were found between the sample and population means, suggesting that nonresponse was not a problem. Some of the non-respondents were asked for the reasons why they were not willing to respond. As Table 3 shows, almost in a third of instances, it was impossible to get hold of the appropriate respondent even after multiple contacts. Also, 8 retailers had gone out of business by the time of data collection.

Table 3 Reasons for Non-Response

Reason	# Retailers	%
Appropriate person not available	90	33.7
Simply declined participation	63	23.6
Promised loosely to answer	63	23.6
Lack of time	25	9.4
Receive too many surveys	18	6.7
Bankruptcy, etc.	8	3.0
Total	267	100

Criteria based on McKelvie (2007)

3.5 Operationalization of Constructs

Operationalization helps with defining each individual construct. Scales could be either adopted from prior research or be developed from scratch. In this study, seven point Likert scales were used in the survey and the items were selected based on prior research as well as the two systematic literature reviews on postponement and logistics flexibility (Papers 1 and 2). The items, which originally dealt with manufacturing industry, were modified during and after the

pilot study to better fit with the retailing context. Table 4 provides an overview of the constructs used in the survey.

Logistics Flexibility

Considering logistics flexibility as the ability to respond quickly to customer needs in delivery, support, and service, the rather extensive framework provided by Zhang et al. (2002, 2003, 2005, 2006) were used. The sub-constructs of logistics flexibility are developed based on Sethi and Sethi (1990), Davis (1993), Day (1994), Langley and Holcomb (1992), Chase and Garvin (1990), among others. The questions were modified to better suit the retailing industry before and after the pilot study. This framework applies a competency-capability perspective and is in line with works of Swafford et al. (2006a; 2008; 2006b) in measuring agility and flexibility.

Application of Postponement

In operationalizing the application of postponement in retailing, the main types of postponement identified in the systematic literature review are used. The wording is mainly based on the works of van Hoek (1998a), Nair (2005), Li et al. (2005) and Rabinovich and Evers (2003a). For parsimony purposes, similar to previous research, labeling and packaging, as well as time and place were included in one item. The following items were used: assembly, design, distribution, logistics (form and time), labeling and packaging, purchasing, and pricing.

Logistics Integration

Logistics integration was operationalized by using the items developed in the seminal work of Chen and Paulraj (2004a). These six items mainly relate to the external integration issues pertaining to the inter-organizational integration between the retailer and its suppliers. This construct was used in Paper 6.

Uncertainty

The latent construct measuring a firm's market volatility are originally developed and empirically validated by Pine II (1993a) and later applied by several researchers. In the instrument, the items developed by Rabinovich and Evers (2003a) and Zhang et al. (2002) were used.

Performance

Performance was operationalized by two constructs. Subjective measures of performance (both strategic and financial) were adopted from Wisner (2003) and Chen and Paulraj (2004a). Objective performance measures were collected from Amadeus.

Control Variables

The following control variables were included in the study: position of the respondent, size (number of employees), and primary and secondary industry classification; of which the first question was included in the survey and the rest were extracted from Amadeus.

Table 4 Constructs in Survey

Construct	Items	Reference
Postponement	Labeling and Packaging Assembly Design Distribution/Logistics Pricing Purchasing	van Hoek (1998a), Li et al. (2005), Nair (2005), Rabinovich and Evers (2003a), Pagh and Cooper (1998)
Logistics Flexibility (second order factor)		Zhang et al. (2002, 2003, 2005, 2006)
Competency	Physical Supply (6 items) Purchasing (6 items)	
Capability	Physical Distribution (6 items) Demand Management (5 items)	
Logistics Integration	6 items	Chen and Paulraj (2004a), Paulraj and Chen (2007b)
Uncertainty	Demand Supplier Technology Competition	Rabinovich and Evers (2003a), Zhang et al. (2002)
Performance (subjective measures)		Wisner (2003), Chen and Paulraj (2004a)
Financial	Market share ROA Average selling price	
Strategic	Overall product quality Overall competitive position Overall customer service levels	
(objective measures)		Amadeus
Financial	Operating revenue EBITDA % ROA	

3.6 Systematic Literature Review

A systematic approach is used in Papers 1 and 2 to review the literature on postponement as well as logistics flexibility. Wacker (1998) discusses that, generally, theory is important since it provides a framework for analysis, provides an efficient method for field development, and provides clear

explanations for the pragmatic world. Systematic literature review has its roots in evidence-based approaches that are widely used in fields and disciplines privileging a positivist and quantitative tradition (Tranfield et al., 2003), and most specially, in the medical science (see Briner et al., 2009). Denyer and Tranfield (2009: 671), define a systematic literature review as “a specific methodology that locates existing studies, selects and evaluates contributions, analyses and synthesizes data, and reports the evidence in such a way that allows reasonably clear conclusions to be reached about what is and is not known”. Mulrow (1994: 597) contends that by applying systematic literature review, researchers can “identify, justify, and refine hypotheses; recognize and avoid pitfalls of previous work; estimate sample sizes; and delineate important ancillary or adverse effects and covariates that warrant consideration in future studies”.

The NHS¹² Center for Reviews and Dissemination (2009) has provided a framework for conducting systematic reviews which entails three stages (Figure 11). Papers 1 and 2 follow these three stages in conducting the reviews. An overview of the first two steps taken is provided here, followed by a thorough description of the third.

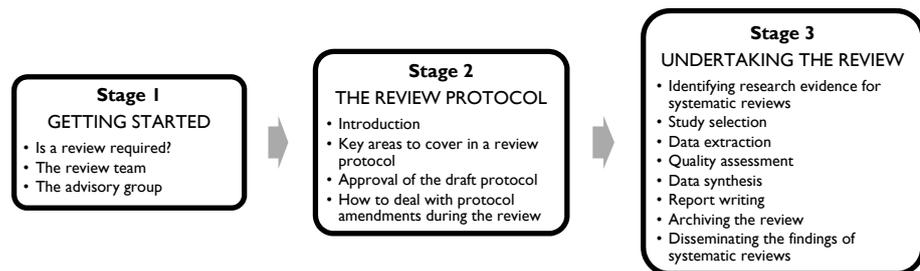


Figure 10 Stages of a Systematic Review

Source: Based on the NHS Center for Reviews and Dissemination (2009)

Getting Started

The motivation for conducting a systematic review of the literature on postponement is rooted in the background and problem discussion of the study. Postponement has been gaining extensive attention among practitioners and academicians. However, the theoretical contribution seems to have been lagging for decades. In this regard, a simple search in the major academic databases (EBSCO, Elsevier, Emerald, Wiley, and Springer) with “postponement” and “literature review” as keywords revealed that except for a few academic articles that are purely literature-oriented (e.g., van Hoek, 2001),

¹² National Health Service in the UK

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most of the contributions seem to be empirically-oriented (e.g., Lo & Power, 1996; Rabinovich & Evers, 2003b; Wu & Closs, 2009). Furthermore, none of the available reviews follow a systematic structure. As a result, the literature reviews on postponement either lack comprehensiveness in terms of the reviewed contributions (e.g., Boone et al., 2007 review 46 research articles) or need some refreshment (e.g., van Hoek, 2001) since there have been major changes in the business environment. So, the motivation and evidence for a systematic literature review on postponement is not just lack of such studies, but rather the fact that there is a need for such a review due to the contemporary practices of an evolving concept in the business environment. In this regard, the team involved in the HUR project, considered the review.

The same motivation goes for the review on logistics flexibility. Although flexibility research has been around at least since the 1980s, there are only few literature review studies on the topic. More importantly, despite the fact that generally logistics flexibility has been regarded as one of the main components of flexibility, there is no literature review which considers it as a separate construct. Of course, as discussed in Paper 2, a major reason could be the lack of consensus in defining and delimiting logistics flexibility. Nevertheless, this brings forward a concern for survey research, since operationalization of the construct becomes blurry and sometimes mixed with other types of flexibility. Therefore, a systematic literature review was carried out on logistics flexibility in 2012 – and later updated in 2014 – following the same pattern and protocols of Paper 1.

The Review Protocol

In this section, the general settings of the review are cleared out. The purpose of the reviews was to provide a framework for the underlying developments in the literature on postponement and logistics flexibility, to identify the research gaps and definitions, and to highlight existing operationalizations. Since postponement as a concept was introduced within the marketing field and was further developed in the logistics and SCM literature, the scope of the review would be marketing and SCM. As for logistics flexibility, the scope was limited to operations management (including industrial engineering related fields) and SCM.

Also, the language in the protocols was limited to English. This could in turn be considered as a delimitation of the study since there might exist some contribution to the field in languages other than English. The publication type was also limited to full-papers in peer-reviewed journals, and did not cover other manuscripts such as books. The draft for the systematic review on postponement was approved by the review team involved in the HUR project, and monthly milestones were set to check the status of the review, assess the quality, and amend the protocol, if necessary.

Undertaking the Review

In order to identify research evidence for the systematic review, searching in electronic databases was chosen. Further, reference lists from relevant studies were visually scanned to assure that the evidence-gathering was all-inclusive. The selected databases were: Elsevier, Emerald, John-Wiley, and Springer. In the review on logistics flexibility, Taylor and Francis, ABI, and Inderscience were included as well. Finally, the EBSCO¹³ database was used in both studies to capture the remaining evidence. Some criteria were considered in order to prevent duplication.

In Paper 1, “Postponement” was used as the keyword for searching in the queries in all databases and the time span was set between 1900 and 2010. The initial searches retrieved over 11,000 articles; therefore, a two phase filtering approach was taken to discard the irrelevant articles. In the first phase, all the article titles, keywords, and journal names were skimmed. An alternative, less time consuming method, would have been to limit the included journals to the fields of marketing and logistics. The reason for the chosen approach was to make sure that the interdisciplinary studies on postponement would not be left behind. This resulted in a total of 681 potentially eligible articles. Subsequently, the abstracts of all these articles were investigated to check if they are within the scope of the review, as stated in the protocol. As a result of this phase, a total of 263 relevant articles were highlighted for thorough investigation.

In Paper 2, the key terms “Flexibility and Logistics” and “Flexibility and Chain” were used for searching both the keywords and abstracts in articles published up to 2015. The term “chain” was not included as it was assumed to be captured in the hits under “supply”. As a result, in the first screening, 971 potentially eligible articles were retrieved. EndNote was used as the reference management system to manage documenting the decisions for the review. Also, based on the requirements of the review, data extraction forms were tailor-designed using Microsoft Excel sheets. These standardized forms helped with assuring consistency throughout the review. Some criteria were considered in order to prevent duplication. As a result, 806 unique articles were identified. Subsequently, the abstracts of all these articles were investigated to check if they are within the scope of the review. A total of 240 relevant articles were highlighted for thorough investigation and were checked for fit to the research purpose. Finally, 100 relevant articles were identified and selected for further analysis. Table 5 shows the final articles included in the studies after the filtering phases in each of the papers.

¹³ Business Source Premiere

Table 5 Total Number of Articles after the Filtering Stages

Publisher	Elsevier	Emerald	Springer	Wiley	EBSCO	T&F	ABI	Inderscience	Total
Paper 1	95	93	17	5	53				263
Paper 2	18	41	8	10	2	13	1	7	100

EndNote was used as the reference management system to manage documenting the decisions for the review. Also, based on the requirements of the review, data extraction forms were tailor-designed using Microsoft Excel sheets. These standardized forms helped with assuring consistency throughout the review. The criteria used for designing the extraction forms resulted in two categories of information:

General Information This type of information was gathered in order to keep a record of each entry and included Record Number (to uniquely identify the entries), Author(s), Name of Journal, Article Title, Date of Publication, and Publisher. Further, general information (such as Citation, Abstract, and Keywords) were recorded by linking each entry to the reference management system.

Study Characteristics This category of information was gathered in order to serve the purpose and research questions of the review and included Definition of the construct, Contribution/Major Remarks, Types of Postponement/Flexibility, Article Type, Method, Area (other than the scope of the review), Industry/Taxa, and Notes. Each article was analyzed based on the content area, approach to methodology, and type of inferential method being applied. The groups within some other classes were identified throughout the review process and were investigated in the review meetings for finding a common thread and were hence modified. An example is Type of Postponement that was amended during the review since various terms are used by different authors to refer to the same type of postponement. It should be noted that in categorizing studies that consider specific types of postponement into broad categories, one should be aware of the “trade-off between the need for organizing the classification into a manageable number of categories and the loss of specificity” (Brown & Dant, 2009).

3.7 Quality

The overall data quality in mixed research has been a topic of debate. O’Cathain (2010) critically reviews three main approaches to quality in mixed methods research. The first one, is “the generic” approach in which general

criteria for any type of research is used to evaluate the quality of mixed methods research. This approach has been criticized for ignoring possible quality specificities in mixed methods research. The second approach is the “individual components” approach. Proponents of this stance contend that the overall quality of a mixed methods research could be determined by standards of quality in the qualitative and quantitative strands (Teddlie & Tashakkori, 2009: 214). These two criteria are in line with the quality guidelines suggested by Lincon and Guba (1985) which include credibility, transferability, dependability, and confirmability. It is argued that regardless of the data collection procedures, two basic quality criteria are generally discussed in relation to quality of mixed methods research, validity and reliability. If validity and credibility are ensured for the two strands, the validity of the overall study will be confirmed. However, mainly due to the underpinning philosophical assumptions of different strands, certain problems may arise. Therefore, O’Cathain (2010) propose an integrative framework which will be used here to discuss the quality of the study as a whole rather than delving into the quality issues in each individual component of the dissertation. The selected criteria from the framework addressed here are depicted in Figure 12.

During the planning stage, quality was ensured first of all by providing sufficient foundational element. The two systematic literature reviews on postponement and logistics flexibility paved the way for situating the overall study purpose and the consecutive research questions. The explorative and explanative nature of the purpose as well as the academic call in the literature on postponement and retail SCM in general – as discussed in Chapter 1 – provided reasonable justification for selecting a mixed methods approach. Planning transparency was borne in mind from the offset of the dissertation. Being engaged in the HUR research project as well as the research proposal presented in 2011 gave the author the opportunity to establish the detailed plan regarding the study design, data collection, analysis, and reporting according to the time-plan. During this endeavor, feasibility was taken into consideration in designing each component and strand regarding the availability of resources.

In undertaking the study, several criteria were taken into account in order to ensure the design quality. First of all, design transparency was ensured by grounding the study design in the typologies resulting from the systematic literature reviews. It was made sure that the selected designs in both strands are appropriate for addressing the overall thesis purpose. Therefore, design suitability could be verified by ascribing different papers, which to some extent build on one another, to different research questions serving the purpose. In order to ensure data quality, first and foremost, in each strand the methods were thoroughly described in sufficient detail. The fit of the strands within the whole study design also contributes to design transparency. Moreover, it was ensured that data collection was done with rigor in each strand. Data collection processes were clearly described while the sampling techniques and tools were explained in detail and it was discussed how adequate sample sizes are in

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-serving the predefined purpose. Analytic adequacy, and integration rigor was ensured by reflecting on the presented theoretical frameworks in every paper, in a followable fashion. Besides theoretical grounding, pattern matching and coding done in NVivo 10, is an example, through which the empirically observed patterns were compared with other relevant research and the theoretical framework. Theory triangulation was considered as a means to verify the findings by adopting multiple perspectives on the question. Triangulation was done at different stages of the study in data collection (interviews, survey, netnography, secondary data, etc.), and researcher (working in teams of academic researchers).

During the interpretation phase, the main concern was to make sure that interpretation rigor is achieved by transparency in explaining which findings have emerged from which methods. Also, by ensuring that the conclusions are based on the findings in each of the strands, consistency of interpretation is strived for. It ensured that the inferences are consistent and backed with the theories already discussed. All in all, the inclusion of several researchers (researcher triangulation) in different papers and strands increases the interpretive agreement of the results. Following the quality factors for qualitative case studies in SCM suggested by Seuring (2008), communicative validation, or credibility was ensured in a way that the respondents were given access to the interview material throughout the study. Moreover, the respondents in both strands were given the option to participate anonymously to ensure ethical considerations. Transferability of the results to other contexts and settings were discussed in the light of the limitations of the study.

In the dissemination phase, reporting quality was taken into consideration by ensuring report availability within allocated resources in a transparent fashion. In all stages of the study it was intended to see the thesis as a whole rather than separate individual pieces of papers to ensure that “the whole is more than the sum of the parts”. In concluding the dissertation, as well as in each strand, implications to theory, practice, education, and methodology are presented, which adds to the utility quality of the dissertation.

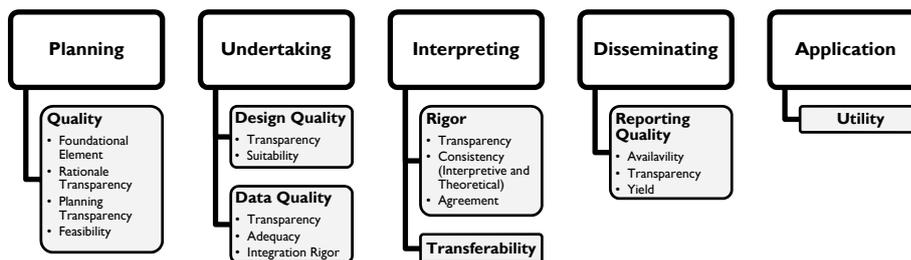


Figure 11 Selected Quality Criteria in a Mixed Methods Research Process

Source: Based on O’Cathain (2010)

3.8 Summary

This chapter presented a detailed discussion on the method of the dissertation. After underlining the overall study design of the thesis, comprising of two sequential strands in mixed methods, the process of data collection was described in detail. Also, the operationalization of the constructs used in the survey were overviewed by presenting the main corresponding references. Also, the process of carrying out systematic literature reviews on postponement and logistics flexibility in Papers 1 and 2 was described. Finally, study quality was discussed. Here, integrative quality criteria in relation to mixed methods study designs were addressed rather than specific quality issues pertaining to individual papers, which are discussed in respective papers.

4 Discussion on Findings

This chapter presents a summary of and discussion on the findings. Specifically, each of the research questions will be addressed in relation to the findings from the appended papers. Papers 1 and 2 are foundational to the overall design of the dissertation, as they review the literature, and hence, partially address the three research questions. In this regard, this chapter starts with addressing the research questions by reflecting on the findings from the papers.

4.1 Postponement and Logistics Flexibility

To explore how postponement is applied in retailing and how such application could be connected to logistics flexibility, first a set of two systematic literature reviews were carried out in Papers 1 and 2. In Paper 1, the types of postponement, its definitions, significant scholarly contributions, as well as methodological considerations were discussed in relation to the existing literature. This literature review, as presented in Paper 1, contributes to the SCM literature by focusing on the principle of postponement. Specifically, since this study was carried out as an introductory input to the HUR project, the retailing context was taken into consideration. First of all, an overview of the origins and premises of the principle are presented. Specifically, by having the retailing industry in mind, the results of the paper highlight the developments and gaps in the literature on postponement. The findings are based on a systematic review of 263 journal articles on postponement and indicate that postponement has gained a growing academic attention in the past two decades. Although the majority of scholarly contributions use the classic “form, time and place” types of postponement, the paper points to several emerging types of postponement expanding its application. The introduction of pricing and purchasing postponement are among the more recent instances of postponement conceptualized in the literature.

Implementing the principle of postponement, as initially coined by Wroe Alderson in (1950), is challenging in business practice since it involves complexities associated with complete supply chains. Since that time, the principles of timing supply were left relatively unnoticed in academia until Pagh and Cooper (1998) provided a new set of models, based on the decoupling theory (Christopher & Towill, 2000), modelling variations in the postponement from an end-to-end supply chain perspective pointing to variations in supply configuration regarding product time combined with place and form utilities. The seminal Postponement / Speculation Matrix of Pagh and Cooper (1998) has certain shortages. In Paper 1 it is discussed that with the developments and extensions of the principle of postponement, certain new types of postponement do not fit in the manufacturing / logistics framework suggested

by Pagh and Cooper (1998). For instance, price postponement could hardly fit in the matrix, similar to any purely marketing-oriented delayed activity. Therefore, the shift of view from a pure manufacturing context to a more comprehensive perspective is suggested to include other types of postponement and to expand the applicability to other industries such as retailing. It is argued that perhaps, the principle should look back to its origin, marketing, to set free from the limitations incurred due to a sole manufacturing perspective.

The various real-life examples from retailing discussed in Paper 1 hint at the directions the principle could be heading in its further development. Specifically, services could be an arena which might be further empirically explored for practicing postponement. The recently studied contexts of healthcare and restaurant services (Rahimnia & Moghadasian, 2010; Rahimnia, Moghadasian, & Castka, 2009) could be expanded to include other service sectors. Also, identity is one of the main types of postponement suggested by Alderson (1950) which has been rather untouched ever since. According to Alderson (1957: 69), "... progressive differentiations of products and service is key to defining values created by marketing". These values are subject to negotiations in relation to transactions that transform the title of the product or service offering. Therefore, product flow timing involves value creation. Coupling "identity" to transformation reveals the fundamentally interlinked nature of logistics and marketing in product transformation. Identity is a perception of the product or service outcome from the interrelated value network flows. Value is realized as an aspect of customer value; an equation of perceptions of customer benefits in relation to the total cost of ownership (Christopher, 2011). Product identity is interlinked with value perceptions. Product value perception is embedded in a more complex product identity construct where competing offerings are in the minds of actors compared with each other as well as with meanings derived from a wider social and natural environment (Engelseth & Jafari, 2012).

To address the lack of consensus in conceptualizing and defining logistics flexibility, a systematic review of the literature on logistics flexibility, similar to that of Paper 1, is carried out in Paper 2. Several earlier scholarly works have focused on supply chain flexibility; and as a result, have considered logistics flexibility as a single component within the broader framework of supply chain flexibility. The problem with earlier research on flexibility in general is that it is heavily weighted towards the manufacturing industry; and hence, neglecting other industries such as retailing. The reason why logistics flexibility is more relevant and interesting for the dissertation – compared to other types of flexibility – is the fact that most retailers do not engage in any manufacturing activity directly; therefore, purely manufacturing-plant-focused flexibilities are not relevant in the retailing context. However, retailers are all involved in logistics activities in one way or another, either directly or via service providers. In order to avoid the confusion regarding logistics flexibility as a stand-alone

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concept, the contributions of Zhang et al. (2002, 2003, 2005, 2006) are used as a general guiding framework for analyzing the existing literature using NVivo as a coding platform. This framework includes upstream and downstream aspects of logistics flexibility, which include purchasing, physical supply, physical distribution, and demand management flexibilities. The categorization is rooted in the competency/capability viewpoint. The first two flexibilities are competencies and the latter two are customer-facing capabilities. The article analyzes a total of 100 academic papers and finds that the attention to logistics flexibility has been on the rise in recent years.

The results show that a myriad of terms have been used in addressing logistics flexibility components and therefore using a unified framework helps to establish consistency among what is being studied. The review of the definitions of logistics flexibility highlights a concern regarding the level of analysis. It reveals that although the majority of the existing articles position their contributions within the broader level of supply chains or networks, in fact, empirically, they address logistics flexibility at the firm or dyad levels. The results show that the majority of articles have an empirical orientation and employ surveys as their main means of data collection with an average response rate of 23%. SEM appears to be the most widely used tool for data analysis in empirical studies. Just like the results of the literature review on postponement, the results of Paper 2 show that manufacturing is by far the most widely addressed context in logistics flexibility research with 78% of empirical contributions. In analyzing the measures used in studying logistics flexibility, it was highlighted that distribution flexibility is given the most attention among the four sub-constructs. Several main themes were underlined as a result of the analysis, which were addressed in the subsequent papers in the dissertation. The findings from Papers 1 and 2 provide further supporting argument for studying the concepts in the context of retailing.

In order to explore how postponement is applied in retailing and how such application could be connected to logistics flexibility, two sets of empirical studies were carried out in Strand I (Papers 3 and 4). Among the findings of the literature review in Paper 1 is the fact that the majority of the empirical scholarly articles on postponement apply a mathematical modeling approach; mainly, in the operations research context. There has been a growing trend towards conceptual and case study papers in recent years. Paper 3 explicitly addresses RQ₁ by means of three case studies on Media Markt, Jysk, and Lidl. The paper is built on the results from Papers 1 and 2. The potential areas for applying postponement in retailing were specifically sought after. Also, the logistics flexibility framework by Zhang et al. (2002, 2003, 2005, 2006) was used in exploring instances of flexibility. The results mainly rely on qualitative data gathered via interviews in Sweden and Denmark and were all coded in NVivo. The study shows that the retailers have different approaches to postponement and speculation due to several contingencies as well as product characteristics; however, there seems to be increasing tendency towards applying

postponement among retailers. Moreover, by reflecting on the product typology introduced by Fisher (1997) and the level of uncertainty, the study profiles and discusses different types of postponement applied by the three retailers.

Due to the inherent complexity of industrial networks including potentially mismatched technology, actor interests, knowledge, company size and power, the complete supply chain context represents both a source of finding complementary advantages through networking as well as a realm of conflict. Postponement is dependent on that at least two tiers of sequentially dependent supply chain actors cooperate in designing the timing of product supply. As the principle of postponement involves more actors the risk of encountering obstacles in designing and implementing this principle increases. Many businesses have still managed to implement the principle of postponement in parts of a supply chain (van Hoek, 2001). These applications have often involved developing integration between a limited set of partners and taking into consideration the organizational context for using this principle (Bowersox & Morash, 1989). Insights from some immediate upstream and downstream actors are provided in Papers 3 and 4. By reflecting on the postponed activities up to the distribution centers as decoupling points, the role of TPLs in carrying out certain postponed activities in relation to various actors in supply chains is highlighted in Paper 3.

Moreover, it is argued that other logistical flows in relation to postponement, such as those related to finances, have been rather underexplored as opposed to product flow. Attention is drawn to information and financial flows in logistics. From an investment perspective, customer value must be balanced with returns on investment. High returns of investment secure procurement of funds, while achieving customer value secures recurring sales and together with costs associated with value creation generate returns of investment. Profitable operations secure a healthy allocation of funds to various company stakeholders. The monetary flow represents an indication of economic quality of product supply (Engelseth & Jafari, 2012). There are a range of different financial resources that may also be transformed in relation to time, place and form. Like information, monetary resources may be either material or not, such as money or registrations of obligations in information systems. The monetary flow is closely intertwined with the possession aspect of the product.

In Paper 3 it was argued that as another set of actors who can be further incorporated into supply chains, customers can play an active role in value creation processes. Through interaction and integration with consumers, supply chains could improve their capabilities in providing further customization. The role of consumers in postponement application is discussed to be surprisingly underdeveloped compared to other upstream actors; hence, a unique research and practice opportunity is underlined in the paper. The study shows that retailers have a tendency to involve other upstream actors such as suppliers and

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TPLs, as well as consumers in applying postponement. Retailers can exploit the competencies and capabilities of these other actors to achieve higher flexibility and responsiveness. The secondary material on TPLs shows that these actors are proactive when it comes to providing supplementary services as well as several postponed value adding activities including packaging and labeling. Involving consumers in postponement activities could reduce various costs for retailers such as in assembly and transportation, and could improve customization and differentiation. The results also points to several potential areas for applying postponement, especially, inside physical stores to increase store productivity and shopping experience. These results were specifically used as inputs for designing Paper 4 in further addressing RQ₁.

The results of Paper 3 also pointed to the opportunities created by the use of software in innovative products to further apply postponement. Upgradeable and programmable products enable new means of postponement and increase the possibility of customization. Customization is a manifestation of postponement and has been widely studied in connection with postponement. Retailers have a unique position in the supply chains when it comes to customization. They are in the frontline of interacting with consumers. Customization is further explored in Paper 4. This paper also contributes to addressing RQ₁ by focusing on the customization processes in bicycle retailing. Three case studies of small retailers of upmarket bicycles were carried out. This paper is built on the results of Papers 1 and 3. In these two articles, it was pointed out that by applying different types of postponement, as well as by involving consumers into value-adding activities, customization could be achieved. Also, it was highlighted that there is a “multiple role playing” in contemporary supply chains in which actors take on roles and participate in activities that were formerly conceived of as being associated with other upstream or downstream actors. Paper 4 sheds light on the interaction of retailers and consumers in the customization process by exploring how these actors interact. The paper relies on a myriad of data collected from interviews, netnography, and secondary material.

Paper 4 builds on a modified version of the theoretical framework developed by Payne, Storbacka, and Frow (2008) which is grounded in Practice Theory and SDL (Lusch & Vargo, 2006; Vargo & Lusch, 2004). Different levels of customization are overviewed in the paper including collaborate (mass customization), adaptive, cosmetic, transparent, and customerization (highly IT-sensitive personalization which does not require manufacturing capabilities by the retailer) along with several examples. It is also highlighted that the time during which customization occurs could vary according to the different stages in the value-creation process. In embedded customization, a standard product could be altered and modified by consumers during use Pine II (1993b). Co-creation is highlighted as the cornerstone is customization. Payne et al. (2008)’s framework of value co-creation includes the supplier’s (retailer’s) processes as well as consumer processes which helps in understanding how retailers and

consumers interact during the encounter process. It also reflects on the outcomes for each of these parties as a result of interaction.

The three retailers studied in Paper 4 are profiled regarding their products, typical customers, and supply chains. Bike by Me and myownbike offer semi-assembled fixies which require further mounting by consumers. 718 Cyclery, however, has a more collaborative approach and carries out design and assembly together with consumers, who are generally more mature, in their physical store. The results show that the two retailers operating online and in multi-channel, use their suppliers and TPLs' facilities and expertise in postponement processes, and have managed to lower their lead-times up to a week. These results are in line with the findings of Paper 3 indicating the role of TPLs in implementing postponement and increasing logistics flexibility for retailers. Although the retailers differ regarding the type of customization they offer, several red threads emerge in terms of how they interact with their customers during customization.

In analyzing retailer processes, it was realized that the main opportunities for co-creation as raised by the retailers relate to technology and social media. The use of online configurators facilitates the customization processes. Bike by Me's blog-type site, The Bike You Like, is a means of sharing experiences, stories, as well as typical customized bicycles which could help potential shoppers in selecting their new bicycles. Offering too many options to customers has been regarded as a downside of customization which could lead to complexity and confusion (Huffman & Kahn, 1998). A recent trend of experience seeking by consumers could be another opportunity for retailers to further engage consumers in the value-creating activities. Supply chain solutions, such as tracking solutions, and design for postponement facilitate planning for value co-creation in retailing. Simplicity appears to be a main contributor to involving consumers and improving shopping experience. The three retailers actively follow up shopper insights and feedback.

A closer look at "consumer processes" shows that the sense of differentiation and standing out from the crowd is considered to be the main emotion associated with participating in customization of bicycles. Variety-seeking behavior and the possibility to express one's character led to a higher emotional attachment to customized bikes to the level that some consumers see their bikes as their "children". The coolness and ease of interacting with the retailer (e.g., via online configurators), as well as social media appearance contributes to the cognitive aspect of consumer processes. Finally, long-lasting satisfaction and loyalty are frequently mentioned as behavioral outcomes of bicycle customization. Interestingly, it was revealed that although consumers are provided with a wide array of options in combining the components of the bicycles, still black and white combinations are nonetheless the most popular customized bicycles. Therefore, it is not just having too many options or colorful design which leads to consumers participating in bicycle customization processes but rather the experience of involvement in such processes. This is

linked to the positive outcomes associated with DIY (or what is recently referred to as the “IKEA Effect”) (Franke, Schreier, & Kaiser, 2010; Norton, Mochon, & Ariely, 2012), as well as consumer logistics (Granzin, Painter, & Valentin, 1997) in retailing. Shoppers manage much of logistics-related issues and flows such as of products and related information between the stores and their households (Teller, Kotzab, & Grant, 2012).

4.2 Empirical Taxonomy of Logistics Configurations

To answer RQ₂, the results of the studies in Strand I were used as inputs for Paper 5. This paper follows up the findings from Paper 3 and builds on the literature reviews of postponement and logistics flexibility carried out in Papers 1 and 2. The article specifically addresses RQ₂ and sets off to identify groups of retailers based on their similarities in applying postponement. An overview of the financial performance of the three retailers in Paper 3 showed that the retailers seem to pursue different performance outcomes. This primary conception is followed up further in Paper 5. The findings from Paper 3 underline that different combinations of postponement application and logistics flexibility could be associated with different levels of performance in different firms. For instance, the grocery retailer Lidl, which has a relatively lower market share compared to Media Markt and Jysk, has a priority to ensure availability, service levels, and store productivity. This indicates that higher postponement and/or logistics flexibility do not necessarily lead to better performance per se and several other contingencies and logistics competencies and capabilities should be taken into consideration to get a better understanding in this respect.

Paper 5 builds on the configuration approach (Ketchen et al., 1993) for identifying taxonomies of retailers, and draws on the RBV for explaining postponement, logistics flexibility, and firm performance. The data used in the article is based on a cross-sectional survey of retailers in Sweden, as explained in the method chapter. Both objective and subjective measures of firm performance were used in the study. Some financial information is extracted from Amadeus to further compare the retailer groups in terms of their performance. Again, by using a modified version of the logistics flexibility framework developed by Zhang et al. (2002, 2003, 2005, 2006), both competencies and capabilities are taken into account. Although insightful, this paper does not intend to reflect on any causality among the constructs considered. Rather, it contributes to better understanding logistics practices in retailing by simplifying the complexities in logistics configurations. As a result, cluster analysis is used to identify similar groups of retailers in terms of application of postponement and logistics flexibility.

Three distinct groups of retailers are identified using cluster analysis. For identifying the groups, postponement as well as the four sub-components of logistics flexibility (physical supply, purchasing, physical distribution, and demand management flexibilities) are used in a two-stage hierarchical cluster analysis. The combination of postponement and logistics flexibility leads to different logistics configurations or practices. The groups identified are labeled as Rigid, Responsive, and Speculative. Responsive retailers pursue both postponement and logistics flexibility, while speculative retailers do not rely on postponement comparatively. A typical example of a speculative retailer could be Lidl, which, as discussed in Paper 3, relies on speculation and forecasting while trying to keep a decent level of logistics flexibility. Rigid retailers, however, had lower logistics flexibility compared to the two other groups, and at the same time practice postponement to an average degree. It is argued that these retailers could possibly rely on economies of scale through carrying medium levels of inventory. Reflecting back on Paper 3, one can assimilate Media Markt to the retailers within this category which take a hybrid approach to postponement and speculation as discussed by Pagh and Cooper (1998).

A further analysis was carried out following the discussion provided in Paper 3 regarding the performance of the identified groups of retailers. In this regard, except for subjective performance measures from the survey such as strategic performance (customer service levels, product quality, and competitive position) and market share, several objective financial measures were also used for the comparison. The three identified clusters of retailers are different when it comes to firm performance. Rigid retailers had significantly lower logistics flexibility compared to the other firms, supporting the claim that generally firms associated with lower flexibility generally have inferior performance. The results show that Responsive retailers have a better strategic performance compared to the two other groups, while Speculative retailers prove to have a better financial performance than others. The Speculative group proved to have the highest combination of performance (except for ROA), followed by the Responsive group (in terms of strategic performance and market share). From a RBV, such superior strategic performance in these firms could be linked to higher competencies when it comes to postponement and logistics flexibility. This is in line with the initial findings presented in Paper 3. From a practical standpoint, this confirms Bucklin's (1965) arguments that applying postponement might not be beneficial per se for firms. Therefore, firms should not neglect the opportunities gained from speculation. These results support previous research showing that higher postponement practices could lead to higher strategic performance, especially when flexibility is higher. From a research standpoint, it shows great potential for further examining the logistics practices of retailers, especially, in terms of postponement and speculation, dynamic capabilities, and performance. Also, the results show that retailers can achieve high performance with extreme application of postponement or speculation if such practice is matched with proper levels of logistics flexibility competency or capability.

Discussion on Findings

Also, the results show that logistics flexibility is increasingly being emphasized by retailers. The findings indicate that coupling different levels of postponement with logistics flexibility could result in logistics configurations which are associated with different performance outcomes. However, the article points to the need for further explaining the performance outcomes in the presence of different contingencies.

4.3 Firm Performance, Uncertainty, and Logistics Integration

Although Papers 3 and 4, provided some empirical insight on the connection of postponement and logistics flexibility, further empirical support is needed to address RQ₃. The findings from the literature review on logistics flexibility presented in Paper 2 highlighted some main themes regarding logistics flexibility. First of all, it was stressed that the literature usually addresses flexibility in relation to some type of uncertainty. This uncertainty could relate to the suppliers, technology, competition, demand, or other contingencies. Second, the nature of the response to uncertainty in flexibility has been a subject of discussion in the literature. While some authors see flexibility as having a reactive nature, some others have pointed towards the proactive and structural flexibility. The resource-based view, competency/capability and contingency theory have been the prevalent theoretical lenses in logistics flexibility research. Moreover, there has been an ongoing debate regarding whether flexibility involves speedy action or not. This has led to a major scholarly debate on distinguishing between flexibility and several close concepts such as agility and responsiveness. Finally, in various articles, postponement has been studied or mentioned in connection to flexibility, mainly as an antecedent. Some scholars have even considered postponement or customization as a component of flexibility in their research.

By shedding light on the overall level of logistics flexibility in the case companies, the results of Paper 3 pointed that those firms which apply or practice postponement to a higher level seem to be more flexible in their logistics operations. Paper 6 builds on the literature reviews carried out in Papers 1 and 2 and the results from Papers 3 and 5. The paper distinctly addresses RQ₃ and uses the same dataset from the survey used in Paper 4. The paper is constructed on the premises of the contingency theory and RBV. Generally, supporting arguments regarding the application of flexibility are grounded in RBV (Liao et al., 2010; Sawhney, 2006). SEM is used for data analysis on 261 retailers in Sweden. In line with Paper 3, it is hypothesized that application of postponement is positively associated with logistics flexibility. The results show that postponement positively impacts logistics flexibility in both inbound and outbound flexibility in retailing firms. The article also

examines the relationship between logistics flexibility and performance. It is realized that higher logistics flexibility is associated with higher strategic performance in retail firms; however, such association was not confirmed when considering financial performance. This is in accordance with prior research examining the effect of flexibility on performance (Nair, 2005; Swafford et al., 2006a), as well as with the contention that flexibility could be overly costly (Gerwin, 1993). The findings support what Stalk et al. (1992) label as “competency-based competition”. In their view, companies that compete effectively on time, outperform competition in terms of several issues such as “the consistency of their product quality, the acuity of their insight into evolving customer needs, the ability to exploit emerging markets, enter new businesses, or generate new ideas and incorporate them in innovations” (Stalk et al., 1992: 57).

Furthermore, the relationship of logistics flexibility and performance is analyzed in existence of contingencies including demand, technology, supplier, and competition uncertainty. From a contingency view, performance is “a function of the congruence between an organization and its environment, strategy, and structure” (Fredericks, 2005: 556). Strong support is found for the moderating effects of environmental contingencies on the relationship between logistics flexibility and firm performance. The results provide support for the findings of Merschmann and Thonemann (2011) who argue that companies that match environmental uncertainty and supply chain flexibility achieve higher performance than companies that do not. Therefore, in the existence of higher contingencies, retail firms are better off with higher logistics flexibility. Meanwhile, in case of lower uncertainty, lower logistics flexibility is preferable. This can be also linked to the argument by some scholars who maintain that some firms or supply chains actually “encourage a degree of environmental uncertainty in order to gain a competitive advantage from their flexible capabilities” (Stevenson & Spring, 2007: 701).

The moderating role of logistics integration on logistics flexibility – performance relationship is also examined in line with RQ₃. Logistics integration could be seen as a competency which is achieved through a long-term process. It reflects the growing importance of logistics as a coordinating mechanism among multiple units within a firm and, as a source of customer value and competitive advantage (Chen & Paulraj, 2004b). The results suggest that the moderating effect of logistics integration on the relationship between logistics flexibility and firm performance could be different based on the performance measure. In case of strategic performance, logistics integration has a positive moderating role while in case of financial performance, this role is negative. The negative moderating role of logistics integration on the logistics flexibility – financial performance relationship is argued to have roots in the costs associated with implementing logistics integration. This contributes to the ongoing debate on whether and how logistics integration contributes to firm performance (Blome, Schoenherr, & Eckstein, 2014; Braunscheidel & Suresh,

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2009; Fabbe-Costes & Jahre, 2008). The results complement the findings of Droge et al. (2004) who showed that integration directly affects firm performance even after time-based performance is accounted for. Therefore, retailers focusing on logistics flexibility need to look beyond their organizational boundaries and invest on seamless integration with the supply chain partners to reach higher performance than the competition. Logistics integration between retailers and their suppliers has proven to help in providing the greatest value to customers at the lowest possible cost (Kumar, 1996). From a RBV the results of Paper 6 support the synergistic nature of resources and/or capabilities in being more valuable when combined (Paulraj, 2011). Practically, the findings of the study suggest that retailers that invest in competencies such as postponement can achieve higher levels of logistics flexibility which, in turn, has a strong positive effect on their performance. Although firm size did not prove to have any effect on performance under any of the circumstances covered in the models tested in Paper 6, it should be noted that a large proportion of the firms in the study are SMEs. Logistics decisions, especially related to integration, are some of the most significant challenges for these firms (Gélinas & Bigras, 2004).

4.4 Summary

This chapter provided a discussion on the findings of the thesis. Specifically, by addressing the three research questions presented in Chapter 1, first, different types of postponement identified in Paper 1 were overviewed. Also, the results of exploring the application of postponement in retailing in Papers 3 and 4 were summarized. The output of Papers 2, 3 and 5 were further discussed in relation to logistics flexibility. Specifically, the taxonomy explored in Paper 5 which addresses RQ₂ was presented. Finally, the performance implications resulting from Papers 5 and 6 were discussed. In this regard, both the performance differences in the taxonomy study, as well as the performance associated with different levels of logistics flexibility were discussed. Finally, it was argued how logistics integration and environmental contingencies moderate the relationship between logistics flexibility and firm performance in retailing. Table 6 summarizes the key findings from the Papers in relation to the research questions.

Table 6 Summary of the Findings of the Papers in Relation to RQs

Paper	RQ ₁	RQ ₂	RQ ₃
1		Major types of Postponement are identified as Logistics, Purchasing, Design, Labelling and Packaging, Assembling, and Pricing	
2	Existing literature is analyzed based on the four sub-constructs of logistics flexibility including purchasing, physical supply, physical distribution, and demand management flexibility		
3	Postponement appears to be gaining more attention among practitioners	New and emerging types of postponement are explored	Manufacturing has been the main context in which logistics flexibility is empirically studied
	All three case companies seem to focus on increased logistics flexibility		
	It seems that the retailers that apply postponement to a higher degree have higher logistics flexibility		
	The role of TPLs in increasing logistics flexibility as well as facilitating applying postponement is underlined.		

4 Customization is explored as a manifestation of applying postponement
Different levels of customization are employed in the case companies
Consumers take an active role in co-creating value
Customization improves shopping experience in bicycle retailing

5 Three clusters of retailers are identified based on application of postponement and logistics flexibility; Rigid, Responsive, and Speculative
The clusters have significant differences in terms of firm performance
Increased postponement and logistics flexibility competencies, are associated with superior firm performance
Retailers can achieve high performance with extreme application of postponement or speculation if such practice is matched with proper levels of logistics flexibility competency or capability

Postponement positively impacts logistics flexibility

Firms with higher logistics flexibility have superior strategic performance

The logistics flexibility to firm performance relationship is positively moderated by uncertainty

Logistics integration moderates the relationship between logistics flexibility and strategic performance, and financial performance, positively and negatively, respectively

5 Conclusion

This chapter concludes the dissertation. By reflecting on the overall purpose, some concluding notes are presented along with the contributions. The contributions of this dissertation are multifold. In this section, the theoretical, managerial, and pedagogical contributions are overviewed. Finally, by addressing the limitations of the thesis, some suggestions for future research are proposed.

5.1 Concluding Remarks

The overall purpose of this dissertation is to explore the application of postponement and logistics flexibility in retailing, and to investigate the resulting firm performance. The purpose was narrowed down by means of three research questions which were addressed in the appended papers. The study takes a sequential mixed methods design in which the results from the earlier papers were partly used as input for the following papers. The result show that the literature on postponement has evolved since the seminal work of Alderson (1950) to include different types which fit under marketing, logistics, and manufacturing areas. The principle of postponement is further expanding to industries associated with pure services. It was shown that consumers could be highly involved in postponement and customization processes which would lead to higher satisfaction and loyalty, and meanwhile lower costs for retailers. Also, the capabilities of suppliers and TPLs could enable application of postponement.

The taxonomy of retailers resulting from postponement and logistics flexibility was extracted. The findings show that the resulting logistics configurations from postponement and logistics flexibility are associated with different performance levels. If postponement and logistics flexibility are high, then strategic performance will be higher. Meanwhile, if speculation and logistics flexibility are high, then financial performance will be higher. It was statistically proven that application of postponement leads to higher logistics flexibility in retailing. Also, logistics flexibility was shown to have a positive impact on strategic firm performance. However, this impact is moderated by uncertainty as well as by logistics integration. That is to say, in environments associated with high uncertainty, higher logistics flexibility is preferable to increase performance. However, logistics integration proved to have opposing moderating roles in relation to strategic and financial performance.

5.2 Theoretical Contributions

First of all, the findings contribute to the literature on logistics and SCM, especially in the context of retailing. With the ever-increasing influence and size of retailers, their relative power has escalated in retail supply chains (Hofer et al., 2012). The study addresses a classic supply chain problem in retailing regarding demand speculation and inventory stockpiling. Conventionally, retailers held massive inventory in anticipation of demand due to various contingencies. Another reason for speculative practices are bulk discounts from manufacturers or suppliers. Despite being a traditional approach of retailers, speculation has proven to have various negative cost aspects for retailers. The findings contribute to the evolving literature on postponement by depicting the fact that postponement has gained more attention recently and that new types of postponement are being developed by expanding the principle to broader areas. The case studies explore how various more recent types of postponement such as financial, price, and design are practiced and implemented by retailers. Also, the possibility for applying postponement by capitalizing on software and upgradeable products is pinpointed. Especially, the findings shed light on the unique potential for retailers in implementing postponement due to their positions in supply chains. It is shown how consumers and suppliers can be actively incorporated into postponement practices in a retail setting.

The thesis also contributes to the customization literature by exploring the process of customization as a co-creation instance in which retailers and consumers actively participate. The results highlight how postponement can be manifested in customized products in bicycle retailing. Moreover, it is emphasized that perhaps the most significant outcome of postponement is enabling the opportunity for creating a unique shopping experience. The results also hint to the potential for applying postponement in store. In-store logistics has recently gained increased attention. Inaccurate inventory records and misplaced items in stores are generally discussed as common execution problems (Kuhn & Sternbeck, 2013).

By systematically analyzing the literature on logistics flexibility, the thesis addresses the lack of consensus in defining, categorizing, and measuring logistics-related flexibilities. As opposed to several previous studies on flexibility which consider a limited number of aspects of flexibility, this thesis identifies four main sub-components of logistics flexibility which are later used in empirical analysis. The findings support the arguments of Randall et al. (2011) who found agile/responsive SCM strategies to be retailers' top priority especially under situations of uncertainty. The results highlight the role of SCM initiatives and practices in increasing firm performance. Retailers have been the forerunners in developing and introducing collaborative initiatives such as VMI, ECR, and Category Management. The framework for logistics flexibility in this

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this thesis consists of both upstream and downstream facing logistics flexibility components. Many retailers now frequently rely on the capabilities of their suppliers in order to create responsive supply chains that effectively meet the ever changing needs of customers (Droge et al., 2004). Specifically, logistics flexibility competencies (relating to purchasing and physical supply flexibilities) are dependent on suppliers' logistics flexibilities, and capabilities. The same argument holds for logistics integration. Much of what is known as external integration deals with supplier-facing competencies. This, in turn, shows the relevance of cooperation and partnership in retail supply chains.

Much of the discussion in this dissertation contributes to the literature on time-based performance competition (Abrahamsson, 1993). Earlier studies on retail SCM has proven a potential conflict between facilitating supply chain responsiveness and maintaining close retailer-supplier relationships due to time-pressure (Thomas et al., 2010). Time-based competitors accelerate the flow of information and products to be highly responsive and attract the most profitable customers (Thomas, 2008). The study contributes to the existing scholarly effort on explaining the performance gains from flexibility. While the prevalent practice in SCM literature addressing performance is to consider either financial, operational, or strategic measures, this study includes a myriad of objective and subjective measures of performance.

This research extends the scholarly contributions on RBV addressing flexibility. From a RBV, firms use both firm-specific resources and firm-addressable resources outside the firm as the basis for developing capabilities (Liao et al., 2010). In this thesis, a competency/capability approach to logistics flexibility is taken as suggested by Zhang et al. (2002, 2003, 2005, 2006). This dissertation contributes to the application of RBV in retailing research by considering the relationship between logistics flexibility competencies and capabilities and firm performance. Also, application of postponement is discussed to turn into a resource which could turn into a firm competency over time as retailers gain more knowledge and integrate. Therefore, this study addresses the call for application of RBV in logistics research (Olavarrieta & Ellinger, 1997). The empirical taxonomy presents an attempt to frame out the similarity in practices of retailers regarding postponement and logistics flexibility. Although not carved in stone and dependent on various contingencies and situational factors, the taxonomy helps with deeper exploration of logistics configurations in retailing. It is shown that the resulting logistics configurations are associated with different performance levels. This further extends the connotations of configuration theory into logistics research.

The results of this study further emphasize the role of contingencies in SCM decision-making and firm performance. In light of contingencies related to demand, technology, suppliers, and competition, it is shown that higher logistics flexibility leads to better firm performance. Future studies could further expand the findings of this study by including other more recent or perhaps retail-specific contingencies such as seasonal volatility, unpredictability,

short lifecycles, as well as high consumer impulse purchases (Fernie et al., 2010).

5.3 Methodological and Pedagogical Implications

This dissertation applies a mixed methods research design in studying SCM issues in a retailing context. In this way, the thesis addresses the earlier calls for new and mixed approaches to postponement and retailing research (Boone et al., 2007; Brown & Dant, 2009; Mentzer & Flint, 1997; van Hoek, 2001). The fact that several findings from the early research project were followed up and used as inputs for latter empirical studies could indicate the helpfulness of engagement in research projects early in the dissertation writing process. Working in teams not only facilitates brainstorming and critical thinking but also increases the overall trustworthiness of the study due to investigator triangulation. Also, other types of triangulation including data, theory, and method applied in this dissertation ensure rigor of the study. By explaining the study design and data collection in followable steps, trustworthiness of the overall study is secured. Systematic literature reviews carried out on postponement and logistics flexibility could be valuable starting points for large research projects to ensure foundational theoretical grounding. Applying NVivo for data coding and interpretation helps with sense-making and improves trustworthiness of the results. The case studies carried out via interviews and netnography could hint at a starting point for developing teaching cases for SCM and retailing subjects. The overall study design, as well as the data collection and analysis processes were explained in detail to address the general quality discussion concerns in SCM studies, especially in survey research (Kotzab, 2005).

Existing textbooks on retailing generally have a single-side view on the field; either they are overly focused on retail marketing or are in principle SCM and logistics books which have been tweaked with few examples from the retailing industry. This dissertation is an attempt to show how contemporary SCM research in retailing can bring together the B2B and B2C fields (Dant & Brown, 2008) by integrating multiple aspects and concepts.

5.4 Managerial Implications

From a practical standpoint, the results indicate that there is a growing tendency towards applying postponement to a high degree in retailing. Retailers can gain insight on how they can capitalize on emerging types of postponement. By applying postponement retailers can not only reduce costs

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of holding inventory but also boost customer satisfaction and loyalty by involving them in postponement; much in line with the concepts of consumer logistics, DIY, and the “IKEA Effect”. In this way, much of the risks or costs of transportation, assembly, ownership or even design could be shifted to other actors. Also, postponement showed to improve logistics flexibility of retail firms. The taxonomy study hints at logistics configurations and the respective performance which could guide decision-makers in selecting the proper combination of logistics decisions to reach intended performance outcomes. It could also serve as a guiding tool for developing and modifying retail business models. For instance, if superior financial performance is envisioned, then the *speculative* configuration could be more favorable which entails speculation and above average logistics flexibility. Meanwhile, if strategic performance (related to customer service levels, competitiveness, and overall product quality) is prioritized, then the *responsive* configuration could be more realistic, in which both postponement and logistics flexibility are high. Another result which emerged from the findings was that in general all groups of retailers perceived themselves as having high logistics flexibility. This shows that logistics flexibility is turning into a “given” for competitiveness in retailing. However, later it was shown that logistics flexibility does not always lead to higher firm performance. It was proven that under conditions of low uncertainty or low logistics integration, it is favorable to allocate budgets to other competencies or capabilities than logistics flexibility. Firm size did not appear to have any effect on how firms perform.

5.5 Future Research

Although this thesis was built on multiple means of data collection and used several research methods, the results are not without limitations. First of all, generalization of the overall findings of this dissertation should be taken with caution since retailing is not a “one size fits all” business (Randall et al., 2011). Due to its complex nature, empirical generalizations which are important for both discovery (theory generation) and evaluation (theory testing and calibration) become difficult (Kamakura et al., 2014). In this thesis the main focus is on Swedish retailers. Although in Paper 4 two retailers of “fixies” from Germany and the United States were also considered, the intention was to shed light on the customization process rather than firm-specific characteristics. Future studies could consider studying postponement controlling for product types categories. Also, it could be of interest to see whether the results of this study would hold true for different retail formats or in a multi-channel setting. Although several contingencies and uncertainties related to suppliers, competition, technology, and demand were considered in Paper 6 in analyzing firm performance, other studies could take more contingencies such as showrooming. Issues such as knowledge, innovation, and centralization could

be of interest for further exploring postponement as well as logistics flexibility. It should also be noted again that this thesis did not intend to prove postponement as a “magic bullet” principle. In fact, as the results of Paper 4 showed, many retailers can gain high performance with speculation. In relation to performance, this thesis considered a wide range of measures in relation to both strategic and financial performance. Using secondary objective financial measures is a strength of this study; however, future research could include more or different sets of performance measures to test the models presented. Moreover, gathering data from multiple actors in retail supply chains could yield a better picture regarding postponement and logistics flexibility. Furthermore, the interrelationship between the subcomponents of logistics flexibility could be interesting to further expand Zhang et al. (2002, 2003, 2005, 2006) to retailing. Future research could also focus on the SMEs, which constituted a considerable proportion of the studied firms. Logistics and SCM research in SMEs in general, and in small and medium sized retailers in specific, is still its infancy, especially in relation to issues such as flexibility, logistics integration, and logistics service providers (Tipu & Fantazy, 2014; Richey et al., 2012; Gélinas & Bigras, 2004; Gunasekaran & Ngai, 2003; Zhang et al., 2003).

5.6 Summary

This chapter provided a brief conclusion of the dissertation. By reflecting on the overall purpose of the thesis, it was summarized how postponement is being extensively applied in a retailing context. Also, the exploratory and explanatory results in relation to how application of postponement is linked to logistics flexibility were overviewed. It was discussed how firms pursue different performance outcomes in relation to postponement and logistics flexibility, especially under conditions of uncertainty or logistics integration. Finally, possible future areas for research were highlighted by addressing the limitations of the dissertation.

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