International manufacturing relocation - the phenomenon of backshoring

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LUND
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Abstract

Recently, firms have started to bring back once offshored manufacturing activities from far distant locations, an activity referred to as backshoring. The purpose of this thesis is to contribute to the understanding of the backshoring phenomenon by answering four research questions related to different aspects of manufacturing relocation. Thereby, the thesis makes several important contributions to researchers that aim to understand why firms are relocating manufacturing activities, and to practitioners that aim to be competitive in the global market by optimizing their manufacturing network.

The thesis is based on the results of five articles from two separate studies. The first study is a survey study aimed at manufacturing plants in Sweden, Finland, and Denmark, with questions related to manufacturing relocations during a five-year period. In particular, the survey captures data about the drivers and benefits of a specific offshoring project and a specific backshoring project, thus providing unique possibilities to compare the two relocation directions. The second study is a literature study, followed by two types of meta-analyses of previously published case studies. The meta-analyses allowed for accumulation of existing knowledge, in an effort to accelerate the progress of the field.

There are many potential drivers of manufacturing relocation in the backshoring literature. This thesis presents two different ways of grouping them. The results are similar, and indicate that cost, access to competences and access to market are the three most important drivers to explain offshoring and backshoring. However, firms backshore manufacturing activities for considerably different reasons than they offshore. In addition to the relocation drivers, contextual aspects such as plant size, industry and geography also influence the relocation decision. Interestingly, the results show that there is a causal relationship between backshoring and the previous, related, offshoring activity, which means that the offshoring decision has an impact on the subsequent backshoring decision. After relocation, firms are experiencing different benefits depending on the relocation direction. The results show that drivers and benefits are aligned, which indicates that firms realize the expected benefits from a relocation project. However, if the firm desires performance improvements on a broader scale, there is a need to balance the relocation motivations as no driver alone leads to benefits in all performance measures. Based on the results of the meta-analysis, a framework for backshoring studies was created, that includes all aspects identified by previous literature, and that takes into consideration the previous offshoring project. As such, this thesis presents the first complete backshoring framework that considers offshoring and backshoring together.

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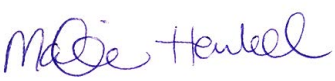
Signature  Date 2021-01-11

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ABSTRACT

Recently, firms have started to bring back once offshored manufacturing activities from far distant locations, an activity referred to as backshoring. Offshoring and backshoring are two options for firms to optimize their global manufacturing footprints. While offshoring has been researched for quite some time, backshoring is a relatively new phenomenon to academia. The purpose of this thesis is to contribute to the understanding of the backshoring phenomenon by answering four research questions related to different aspects of manufacturing relocation. Thereby, the thesis makes several important contributions to researchers that aim to understand why firms are relocating manufacturing activities, and to practitioners that aim to be competitive in the global market by optimizing their manufacturing network.

The thesis is based on the results of five articles from two separate studies. The first study is a survey study aimed at manufacturing plants in Sweden, Finland, and Denmark, with questions related to manufacturing relocations during a five-year period. In particular, the survey captures data about the drivers and benefits of a specific offshoring project and a specific backshoring project, thus providing unique possibilities to compare the two relocation directions. The second study is a literature study, followed by two types of meta-analyses of previously published case studies. The meta-analyses allowed for accumulation of existing knowledge, in an effort to accelerate the progress of the field.

There are many potential drivers of manufacturing relocation in the backshoring literature. This thesis presents two different ways of grouping them. The results are similar, and indicate that cost, access to competences and access to market are the three most important drivers to explain offshoring and backshoring. However, firms backshore manufacturing activities for considerably different reasons than they offshore. Interestingly, plants with experience of relocation in both directions have a more balanced view on drivers than plants that have moved in one direction only. Thus, it seems like there is a learning effect and that previous experience makes it easier for managers to balance benefits against risks. In addition to the relocation drivers, contextual aspects such as plant size, industry and geography also influence the relocation decision. Interestingly, the results show that there is a causal relationship between backshoring and the previous, related, offshoring activity, which means that

the offshoring decision has an impact on the subsequent backshoring decision. This thesis presents three different relocation scenarios based on the relationships between offshoring and backshoring drivers. After relocation, firms are experiencing different benefits depending on the relocation direction. The results show that drivers and benefits are aligned, which indicates that firms realize the expected benefits after a relocation project. However, if the firm desires performance improvements on a broader scale, there is a need to balance the relocation motivations, as no driver alone leads to benefits in all performance measures. Based on the results of the meta-analysis, a framework for backshoring studies was created, that includes all aspects identified by previous literature, and that takes into consideration the previous offshoring project. As such, this thesis presents the first complete backshoring framework that considers offshoring and backshoring together.

For researchers, this thesis provides novel insights into the phenomenon of backshoring, by studying the drivers and benefits of relocation. Essentially, it uncovers the similarities and differences between offshoring and backshoring, and the relationship between them. For practitioners, the studies in the appended papers provide indications of what drives operational performance of a relocation project, thus offering practical insights into how to successfully manage offshoring or backshoring.

POPULÄRVETENSKAPLIG SAMMANFATTNING

Den svenska tillverkningsindustrin har historiskt sett spelat en viktig roll för vår ekonomiska tillväxt och välfärd. Men under de senaste trettio åren har Sverige liksom många andra industrialiserade länder drabbats hårt av att företag flyttat ut produktion till andra delar av världen. Många företag har dock börjat se fördelar med att satsa på produktion på hemmaplan och har börjat ta hem sin produktion igen. Ett aktuellt exempel är optikjätten Synsam som tar hem all sin produktion av glasögon från Kina till Sverige för att komma närmare marknaden. Detta väcker hopp om en ny trend som skulle innebära att den inhemska industrin vitaliseras. Inom akademin är hemtagnings-fenomenet relativt nytt och det är fortfarande mycket som vi inte vet, om hemtagning men även om utflyttning av produktion. Vilka är drivkrafterna bakom beslutet att flytta produktion? Finns det omständigheter som påverkar beslutet? Vilka fördelar ger flyttarna i respektive riktning? Syftet med denna avhandling är att svara på dessa frågor och på så sätt bidra med ny kunskap kring fenomenet hemtagning av produktion. Avhandlingen är därmed ett viktigt bidrag till forskare som vill förstå varför företag flyttar produktion, men även till företagare som vill bli konkurrenskraftiga på den globala marknaden genom att optimera sina produktionsnätverk.

I litteraturen hittar man många potentiella drivkrafter för att flytta produktion och den här avhandlingen presenterar två olika sätt att gruppera dem. Resultaten är snarlika, och pekar på att kostnad, kompetens och närhet till marknad är de tre viktigaste faktorerna. Men svenska företag tar hem produktion av helt andra anledningar än när de flyttar ut. Det enda som verkligen anses viktigt för att flytta från Sverige är låg arbetskostnad, medan beslutet att ta hem produktion baseras på en mängd olika faktorer kopplat till kvalitet, leverans och utveckling. Intressant nog visar resultaten att företag som har erfarenhet av att flytta produktion i båda riktningarna har en mer nyanserad bild av vad som är viktigt vid flytten än de som bara har flyttat i en riktning på senare tid. Det verkar därmed som att det finns en lärandeeffekt och att erfarenhet av att flytta produktion gör företagare bättre på att väga fördelar mot risker i olika regioner. Många av de faktorer som ligger till grund för flytt-beslutet ändras över tiden. Det är därför viktigt att kontinuerligt se över fabrikernas positioner för att säkerställa bästa möjliga uppbyggnad av produktionsnätverket. Men detta är ingen lätt uppgift.

Det är många olika faktorer som vägs samman, ofta med kostnad som den i slutändan avgörande faktorn. Dessutom pekar resultaten på att kontextuella faktorer såsom storlek på fabriken, industri och geografi påverkar flyttbeslutet. Även den tidigare flytten från hemlandet spelar roll för hemtagningsbeslutet, då det finns en koppling mellan drivkrafterna för besluten att flytta ut och ta hem produktion. Det finns en stor skillnad i de fördelar företagen upplever efter att de flyttat produktion i respektive riktning. Utflyttningar leder till lägre arbetskostnader – men inte till lägre övriga kostnader eller andra positiva konsekvenser. Efter hemtagning däremot, upplever företagen flera fördelar, framförallt kopplat till produktkvalitet och effektiva leveranser. Resultaten pekar på att företagen faktiskt får ut det som de förväntar sig, eftersom fördelarna stämmer väl överens med drivkrafterna bakom flytten. Men om företaget vill uppnå förbättringar på flera områden bör man bredda synen på drivkrafterna. Närhet till marknaden bör alltid beaktas då det ger både kostnadsfördelar och fördelar kopplat till kvalitet, leverans och flexibilitet.

Denna avhandling bygger på resultaten i fem artiklar från två separata studier. Den första studien är en enkätundersökning riktad till tillverkningsföretag i Sverige, Finland och Danmark, som kartlägger företagens produktionsflyttar under en femårsperiod. Framförallt fångar den data om drivkrafterna och fördelarna med ett specifikt utflyttnings- respektive hemtagningsprojekt, vilket ger unika möjligheter att jämföra de två flyttriktningarna. Den andra studien är en litteraturstudie med metaanalys av tidigare publicerade praktikfallstudier. Baserat på resultaten skapades ett ramverk för studier av hemtagning av produktion, som inkluderar alla aspekter som utpekats som viktiga i tidigare studier och som dessutom tar hänsyn till den tidigare utflyttningen. Ramverket kan användas både av forskare och av företagare som är intresserade av att ta hem produktion.

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Appended papers

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Johansson, M., and Olhager, J. (2018), "Manufacturing relocation through offshoring and backshoring: the case of Sweden", *Journal of Manufacturing Technology Management*, Vol. 29, Issue 4, pp. 637-657, doi: 10.1108/JMTM-01-2017-0006.

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Paper 2

Johansson, M., and Olhager, J. (2018), "Comparing offshoring and backshoring: The role of manufacturing site location factors and their impact on post-relocation performance", *International Journal of Production Economics*, Vol. 205, pp. 37-46, doi: 10.1016/j.ijpe.2018.08.027.

Status: Published. An earlier version of this paper was presented at the 29th NOFOMA Conference, 8-9 June 2017, Lund, Sweden.

Paper 3

Johansson, M., Olhager, J., Heikkilä, J., and Stentoft, J. (2019), "Offshoring versus backshoring: Empirically derived bundles of relocation drivers, and their relationship with benefits", *Journal of Purchasing and Supply Management*, Vol. 25, Issue 3, pp. 100509, doi: 10.1016/j.pursup.2018.07.003.

Status: Published. An earlier version of this paper was presented at the 24th EurOMA Conference, 1-5 July 2017, Edinburgh, Scotland. It received a "hot paper" notification after receiving enough citations in Web of Science (WoS) in May/June 2019 to place it in the top 0.1% of papers in the academic field of Economics & Business (data from Essential Science Indicators).

Paper 4

Johansson, M., Boffelli, A., Olhager, J., and Kalchschmidt, M. (2019), "A case survey of reshoring case studies: the influence of contingency factors on the relocation decision".

Status: Work in progress. This conference paper was presented at the 10th Annual European Decision Sciences Conference, 2-5 June 2019, Nottingham, England, where it received the award "best theory-oriented paper". Consequently, it was invited for presentation at DSI 50th Annual Conference, 23-25 November 2019, New Orleans, United States, where it received the "best regional best paper award".

Paper 5

Boffelli, A., and Johansson, M. (2019), "What do we want to know about reshoring? Towards a comprehensive framework based on a meta-synthesis", *Operations Management Research*, Vol. 13, Issue 1-2, pp. 53-69, doi: 10.1007/s12063-020-00155-y.

Status: Published. An earlier version of this paper was presented at the 26th EurOMA Conference, 17-19 June 2019, Helsinki, Finland.

Related papers and publications

Journal articles

Johansson, M. and Olhager, J. (2020), "Revitalizing manufacturing: A mixed-methods study of the relationship between process innovations and backshoring", *Journal of Purchasing and Supply Management.*

Status: Submitted and under second review.

Johansson, M., and Olhager, J. (2019), "Manufacturing offshoring and backshoring: A contingency perspective".

Status: Work in progress. An earlier version of this paper was presented at the 25th EurOMA Conference, 24-26 June 2018, Budapest, Hungary. Invited to a special issue in IJOPM of papers from EurOMA 2018.

Martinsuo, M. and Johansson, M (2019), "Strategic renewal of manufacturing toward improved operational performance: The role of manufacturing innovation and manufacturing relocation".

Status: Work in progress.

Conference papers

Heikkilä, J., Johansson, M., Neonen, S., Olhager, J., and Stentoft, J. (2016), "Manufacturing relocation from and to the Nordic countries: comparison across countries and manufacturing firms". Conference proceedings of the 5th World Conference on Production and Operations Management, 6-10 September 2016, Havana, Cuba.

Johansson, M., and Olhager, J. (2016), "Manufacturing reshoring and offshoring: strategy and performance outcomes". Conference proceedings of the 7th Swedish Production Symposium, 25-27 October 2016, Lund, Sweden.

Johansson, M., and Olhager, J. (2017), "Internationella produktionsflyttar – kopplingen mellan drivkrafter och resultat". Conference proceedings of PLAN's Forsknings- och Tillämpningskonferens 2017, 25-26 October 2017, Gothenburg, Sweden.

Johansson, M., and Olhager, J. (2018), "Manufacturing relocations and performance: A contingency perspective". Conference proceedings of the 25th EurOMA Conference, 24-26 June 2018, Budapest, Hungary.

Johansson, M., and Olhager, J. (2019), "Internationella produktionsflyttar – betydelsen av kontextuella faktorer för en lyckad flytt". Conference proceedings of PLAN's Forsknings- och Tillämpningskonferens 2019, 23-24 October 2019, Linköping, Sweden.

Book chapter

Olhager, J., Heikkilä, J., Johansson, M., and Neonen, S. (2017), "Relocation patterns in Nordic manufacturing industries". In Heikkilä, J. (Ed.) *Relocation of Nordic manufacturing*. Tampere, Industrial and Information Management, Tampere University of Technology.

INTRODUCTION

This thesis is about firms, and for firms that are relocating manufacturing activities between foreign locations and the firms' home region. Understanding why manufacturing activities are brought back to domestic locations after being offshore for some time is intriguing to researchers, and practitioners in their quest for right-shoring. In this chapter, the phenomenon of backshoring is introduced, and the importance of gaining a deeper understanding of the topic is emphasized. The thesis contributes to knowledge related to four research questions, which are elaborated on before the research design and the structure of the thesis are briefly described.

Background

It has become hard to tell where things are made. A product as simple as a tennis ball can have traveled over 80 000 km across the world through production sites in 11 countries before it reaches Wimbledon Stadium. The reason? It is the most cost-effective way to produce tennis balls (Johnson, 2017). This is one of many examples of the global nature of production today. Over the past 30 years, there have been major changes in the global location of economic activity. International trade and foreign direct investment (FDI) have increased substantially, and the role of manufacturing plants has changed from focusing on delivering products to domestic markets, via exporting goods to international markets, to supplying international markets through local manufacturing in offshore regions (Cheng et al., 2015). This development has been driven by a number of parallel trends, including market liberalization, financial deregulation, technological advancements, and cheaper transportation. In particular, increased digitalization through advances in information and communication technologies (ICTs) has allowed to fine-slice value chains so that activities can be carried out in different locations, while information can still be shared between off- and onshore sites (Buckley and Strange, 2015). Worldwide markets can be served in different ways, by export, local assembly, or fully integrated production, either within the firm's own manufacturing network or by sourcing value-added activities from external actors (MacCormack et al., 1994; Hameri and Hintsa, 2009). The result is

highly disaggregated, global value chains and manufacturing networks spread across the globe. However, this development has not only generated opportunities for manufacturing firms: Global competition has also dramatically increased the complexity of decision-making. A multitude of factors outside the firm's control influence the location decision, such as foreign exchange rates, trade agreements, competition, and new technologies. However, the firm's own decisions, such as a strategy shift, new market entry, or new product introductions, can turn a well-configured manufacturing network into a poor one (Ferdows et al., 2016). As it can take more than 10 years to build a coherent manufacturing network (MacCormack et al., 1994), the geographic locations of plants have a long-term impact on the firm's profitability (Vos, 1991). Thus, the increased globalization has important implications for a firm's manufacturing strategy, and continuously evaluating the strategic positions of plants is a challenging but highly important task (MacCormack et al., 1994).

Following the globalization trend, many firms in developed countries have relocated manufacturing activities to low-cost economies in, for example, Southeast Asia or Eastern Europe. This has been referred to as offshoring, indicating a relocation of value-adding activities from the home base to a foreign location (Roza et al., 2011). The offshoring trend has become a common business practice among manufacturing firms and is predicted to continue to grow, spurred by further improvements in ICTs, government policy changes, and enforcement of intellectual property rights (Contractor et al., 2010). Offshoring firms are capitalizing on the comparative advantages in other geographic regions, primarily by accessing low-cost labor (Manning et al., 2008; Mihalache and Mihalache, 2016), but also by gaining access to new markets, innovation capabilities, and natural resources (Maskell et al., 2007; Lewin et al., 2009; Contractor et al., 2010). Relocating manufacturing to a foreign location is, to a great extent, a balancing act between obtaining potential benefits and dealing with the costs and risks associated with managing an organization across geographic and cultural boundaries (Mihalache and Mihalache, 2016). For many firms, the offshoring experience has not lived up to expectations, and firms have encountered problems in terms of low quality, increased inventory, long lead times, or coordination issues, leading to additional and unexpected costs (Platts and Song, 2010; Leibl et al., 2011; Larsen et al., 2013; Stanczyk et al., 2017). Additionally, recent trends such as increasing demand for sustainability and the revolution of Industry 4.0 have called on firms to modify the structure and management of their supply chains (Wan et al., 2019b). Thus, a new phenomenon has emerged as a counter-reaction to offshoring. Firms have started to bring back once-offshored activities to the original manufacturing locations, an activity referred to as backshoring (Canham and Hamilton, 2013; Kinkel, 2014; Stentoft et al., 2016b). At the same time, offshoring seems to be decreasing as global

foreign direct investment has fallen considerably the past few years. Consequently, the expansion rate of international production has been slowing after peaking between 2010 and 2012 (UNCTAD, 2018). The backshoring phenomenon has received much attention from researchers and policy makers, with the hopes that industry in high-cost countries will be revitalized through the return of previously lost jobs (Stentoft et al., 2016b; Wiesmann et al., 2017). Governments in a number of countries, such as the United States, Great Britain, and Germany, have even started backshoring initiatives to further spur the phenomenon (Wan et al., 2019b). Although it is unlikely that backshoring will dominate offshoring in the near future, it is clear that offshoring and backshoring are two potent alternatives of a firm's manufacturing strategy (Fratocchi et al., 2014). The global manufacturing landscape is continuously changing, and firms need to review and update their location decisions regularly to find a balance between offshoring and backshoring, and thus, maximize performance (Tate et al., 2014). This search for the optimal locations for specific manufacturing activities has been referred to as right-shoring (Tate, 2014; Bals et al., 2015).

Problem discussion

From a research perspective, offshoring is much more well-known than backshoring. Although it is usually examined from an operations management perspective, theoretical lenses are often borrowed from the field of international business, as that is where the most-developed theories for explaining international manufacturing are found. Backshoring started to receive interest from researchers not more than 10 years ago. One of the first publications appeared in 2009 from the German perspective, but it was not until 2013 that the topic really gained in popularity, and the number of published articles literally exploded. Similar to offshoring studies, backshoring studies often borrow theories from the field of international business. The theories are elaborated on to investigate how well they explain why companies choose to revise their offshoring decision, and thereby, assess the theories' applicability for backshoring studies. Thus far, there is no generally accepted theory to explain the phenomenon of backshoring. Many backshoring studies are not theory based at all but are focused on empirically describing the phenomenon and thereby, making a practical contribution, rather than a theoretical one. A number of literature reviews have been conducted on backshoring (see e.g. Stentoft et al., 2016b; Wiesmann et al., 2017), of which the most recent is by Barbieri et al. (2018). They concluded that the most widely studied aspects of backshoring were the terms and definitions used to describe the phenomenon, as well as the drivers behind the decision to repatriate manufacturing activities. Other

aspects such as the decision-making process and implementation were much less researched. In addition, one aspect that, to a great extent, seems to have been neglected by researchers is the performance effects of backshoring. Ultimately, offshoring and backshoring are done with the hopes and expectations that they will bring benefits and improve the competitive position of the firm. Offshoring studies have illustrated positive and negative outcomes from relocation projects (Mihalache and Mihalache, 2016), but the performance effects of backshoring have so far been overlooked by researchers. The backshoring discourse appears to assume that repatriation of manufacturing activities by default is positive for performance. However, it is highly relevant for researchers to provide empirical evidence of the performance effects of backshoring so that location decisions can be made based on best practices rather than on expectations. Another aspect that has not received much attention from researchers is the relationship between offshoring and backshoring. It is widely acknowledged that backshoring cannot be performed unless there has been previous offshoring (Gray et al., 2013), and scholars have recognized a strong path dependency between offshoring and backshoring decisions. In particular, it has been suggested that previous offshoring could be considered an antecedent to backshoring, as negative offshoring outcomes may lead firms to repatriate manufacturing activities as a means of correcting previous location misjudgments (Kinkel and Maloca, 2009; Kinkel, 2014). Thus, offshoring and backshoring should be investigated together for a full understanding of the interrelated processes forming global manufacturing networks (Kinkel and Maloca, 2009; Barbieri et al., 2018; Di Mauro et al., 2018). However, very few studies have compared the two relocation directions or assessed the similarities and differences between them.

Purpose

Based on the discussion above, there is a need to gain a deeper understanding of why manufacturing activities are backshored after being offshored for some time, for firms to be able to make the right relocation decisions and optimize their global manufacturing footprints. Thus, the overall purpose of this doctoral thesis is to:

> Contribute to the understanding of the phenomenon of backshoring.

The focus of this thesis is manufacturing relocations from and to the domestic plant. To understand the phenomenon of backshoring, several perspectives must be taken into account. A central aspect is to understand the driving forces behind why firms decide to relocate manufacturing. As part of the motivations for relocation, firms are

expecting to gain certain benefits that will improve operational performance in one way or another. However, as discussed above, it is not clear from previous literature that the intended benefits are realized after a relocation project. To understand the dynamic nature of manufacturing relocations, the previous offshoring activity is another important aspect to consider. By comparing backshoring to offshoring, important insights related to the right-shoring decision can be gained. In addition, the conditions in which the firm operates influence the need to relocate as well as the optimal location for specific activities. Therefore, there is also a need to understand how contingency factors may influence offshoring and backshoring decisions. To fulfill the purpose, four research questions were developed. They are discussed further in the following sections.

Research questions

Historically, manufacturing has played an important role in economic growth and social welfare in Sweden. However, global competition has pushed Swedish manufacturing firms to offshore manufacturing activities to low-cost locations, and Swedish industry has suffered from the offshoring trend, similar to many other high-cost countries (Alsén et al., 2013). Many Swedish firms are rethinking their previous offshoring decisions and bringing manufacturing back to domestic locations. Although there was much anecdotal evidence of a possible backshoring trend in Sweden at the outset of this research project, there was no empirical evidence describing the current situation in terms of relocation activity to and from Swedish plants. Thus, the first research question in this thesis aims at providing empirical data of recent offshoring and backshoring in Sweden, and at the same time establishing the relevance of studying manufacturing relocations in the context of Swedish industry.

> RQ1: How are Swedish manufacturing plants affected by recent offshoring and backshoring?

The manufacturing location decision is an important part of a firm's manufacturing strategy, because it can have a considerable impact on the firm's profitability in the long term (Vos, 1991; Gylling et al., 2015). Naturally, much research has been devoted to identifying the motivations and drivers behind the relocation decision, as it offers insights into how firms balance their network capabilities to improve their competitive position. Thus, a large set of relocation drivers have been identified in previous literature. Despite this, researchers have acknowledged a shallow understanding of relocation decision-making, for offshoring (see e.g. Mihalache and Mihalache, 2016) and for backshoring (see e.g. Fratocchi et al., 2016), and no studies have compared the

two directions. With the second research question, this thesis sets out to further investigate the drivers of offshoring and backshoring, including their relative importance, how they can be categorized, and the differences and similarities between the drivers of the two relocation directions.

RQ2: Why are manufacturing activities offshored and backshored?

It is assumed that offshoring and backshoring are done with the expectation that the relocation project will render improvements in the value chain that, in turn, will generate positive performance effects for the firm. Theoretically, benefits include cost advantages, improved quality, delivery reliability, and flexibility, as well as access to skills, knowledge, and innovation capabilities (Lewin and Peeters, 2006; Tate et al., 2014; Ancarani et al., 2015). However, it is not clear from previous studies whether the intended benefits have been realized. Offshoring studies report mixed results, with positive as well as negative post-relocation performance (Mykhaylenko et al., 2015; Mihalache and Mihalache, 2016). For backshoring, there is very limited evidence of the actual benefits gained. In addition, studies have shown that the performance effects of backshoring are different from those of offshoring (Stentoft et al., 2015), but there are no studies comparing the outcomes between the two relocation directions. Thus, the purpose of the third research question is to identify and compare benefits experienced after offshoring and backshoring, and thereby, further investigate the performance effects of manufacturing relocation.

RQ3: How is operational performance affected by offshoring and backshoring?

The decision about where to locate manufacturing is complex. Numerous factors should be considered when finding the optimal location, some of which are context specific. Therefore, within the operations management field it has been acknowledged that no practice has universal validity (Sousa and Voss, 2008). This means that there is not only one best way to design or manage an organization to reach high performance: Organizations need to adapt their structures and processes to maintain a fit with the environment in which they operate (Donaldson, 2001). In terms of manufacturing relocation, this means that there must be a fit between the nature of the relocated activities and the advantages offered by the conditions in the region to where the activities are transferred (Jensen and Pedersen, 2011). However, until this point very few backshoring studies adopted a contingency perspective. Therefore, the fourth research question of this thesis aims to contribute with knowledge about the role of contextual factors for offshoring and backshoring decisions.

RQ4: How does the context in which the plant operates influence offshoring and backshoring?

To answer the research questions, two types of studies were performed. First, a large-scale survey study was conducted in the Swedish and Nordic manufacturing industries. The aim for the survey was to gain further insights into the phenomenon of backshoring and provide empirical evidence of the associations between different concepts identified in literature, but also to test the applicability of the most commonly used theories in backshoring studies. This study resulted in three publications appended to this thesis, together addressing research questions 1–3. The empirical evidence collected by the survey focused on the plant perspective rather than on the firm, which has been common practice in offshoring and backshoring research. Location decisions are normally made from a bottom-up perspective, starting with opportunistic experiments from the lower levels of the organization rather than being part of a corporate-wide location strategy (Lewin and Peeters, 2006). In addition, the performance effects of a relocation project may be insignificant in the context of the firm performance, but considerable at plant level. Thus, manufacturing relocation from and to the domestic plant is a relevant unit of analysis. Second, a systematic literature review was conducted, identifying published backshoring case study research. The aim was to gain deeper knowledge about the two connected events, offshoring and backshoring, and how their processes are interrelated. The second study generated two types of meta-analyses, performed with the purposes of moving research forward by accumulating the existing knowledge within the field. The meta-analyses have broader geographic perspectives as they built on data from several different countries, and thus, addressed only research questions 2–4. The analyses resulted in two appended papers. In total, there are five papers appended to the thesis, each contributing with answers to the research questions and thus, fulfilling the overall purpose. Table 1 provides an overview of how the research questions are addressed by the five appended papers.

Table 1 - Associations between research questions and appended papers

Research questions	Paper 1	Paper 2	Paper 3	Paper 4	Paper 5
RQ1 - The Swedish perspective	x				
RQ2 - The drivers of relocation	x	x	x	x	x
RQ3 - The effects on operational performance	x	x	x		x
RQ4 - The influence of contextual factors				x	x

Thesis outline

This thesis is a compilation of papers, consisting of a summary of the papers (*kappa* in Swedish) and the five appended papers. The *kappa* presents an overview of the research project in terms of the purpose, theoretical framework, and methodology applied, as well as a summary of the appended papers and their main results. Finally, the overall contributions of the thesis are elaborated on, and the results are discussed in light of previous research. The *kappa* consists of six chapters:

Chapter 1 is an introduction to the thesis. It familiarizes the reader with the research area of backshoring, providing the background for the topic. Following a discussion of related problems, the chapter presents the overall purpose of the thesis and the research questions.

Chapter 2 presents the frame of reference relevant to backshoring and summarizes the published literature related to the research questions. Thus, it provides the background and positions the research in relation to previous studies, establishing the relevance of the research.

Chapter 3 outlines the research strategy and describes the methodologies applied in the appended papers, that is, the survey research and the meta-analyses. The chapter then describes the empirical data set on which the studies are based, and finally, it concludes with a discussion regarding the quality of the work.

Chapter 4 provides a summary of the appended papers, briefly describing the purpose, findings, and contributions of each paper, to provide the background for the discussion in chapter 5.

Chapter 5 presents the contributions of the thesis. Each research question formulated in the introduction is answered with a summary of the findings and contributions of the appended papers, discussed in light of previous research.

Chapter 6 summarizes the theoretical and practical implications generated by the findings of this thesis. Further, limitations and directions for future research are briefly discussed and suggested.

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FRAME OF REFERENCE

This chapter discusses offshoring and backshoring from a theoretical perspective and summarizes the related literature published on the topics in relation to the research questions. As the phenomenon of backshoring is relatively new to academia, the chapter starts by clearly defining offshoring and backshoring.

Defining offshoring and backshoring

Location decisions are part of a firm's manufacturing strategy, and ultimately, are made to meet the firm's long-term objectives by supporting its competitive priorities (Olhager and Feldmann, 2018). Offshoring and backshoring are two options for a firm aiming to change its global distribution of manufacturing by relocating manufacturing activities, within the firm as well as in cooperation with external partners. Offshoring refers to "the assignment of business activities to locations outside a firm's national borders in order to support existing business operations" (Mihalache and Mihalache, 2016). This definition emphasizes the geographic aspect of offshoring and its strategic focus, in terms of optimizing the value chain in contrast to only getting access to foreign markets. In literature, the concept of offshoring has often been used interchangeably with the outsourcing concept, although recently a clear distinction between the location decision and the ownership decision has been made. In this thesis, offshoring is defined as the transfer of manufacturing activities from a domestic location to a foreign location, either within the internal manufacturing network or to an external partner. The term backshoring, in contrast, indicates a reverse move of manufacturing activities, back to the original location from a foreign location. Backshoring was first defined in academia as "the geographic relocation of a functional, value creating operation from a location abroad back to the domestic country of the company" (Holz, 2009). However, there is no consensus within academia regarding the terminology of the phenomenon. Many alternative terms and definitions have been proposed and discussed, of which the most common are reshoring and re-insourcing (see e.g. Kinkel, 2012; Ellram et al., 2013; Gray et al., 2013; Kinkel, 2014; Tate et al., 2014; Fratocchi et al., 2015), but there are other relocation alternatives, such as near-shoring (Fratocchi et al., 2014). In

this thesis, the term backshoring is used to clearly indicate a move all the way back to the original location, in line with Albertoni et al.'s (2017) definition. They referred to reshoring as a generic change of location with respect to a previous offshoring decision. Reshoring can include further offshoring (relocating to another offshoring location) or backshoring (relocating back to the home country). Thus, offshoring and backshoring are two different specifications of the generic decision to change location (Albertoni et al., 2017). In this thesis, backshoring is defined as the transfer of manufacturing activities back to the domestic location from a foreign location, either within the internal manufacturing network or from an external partner. The focus of this thesis is manufacturing relocation from and to a domestic plant, as illustrated in Figure 1. Other types of relocation (further offshoring, near-shoring, etc.) or relocation to and from an external partner in a domestic location are not included in this study (shaded in Figure 1). In addition, backshoring can be conducted to different degrees, that is, fully or partially by keeping some activities offshore (Gylling et al., 2015; Benstead et al., 2017). However, this thesis does not distinguish between different degrees of backshoring.

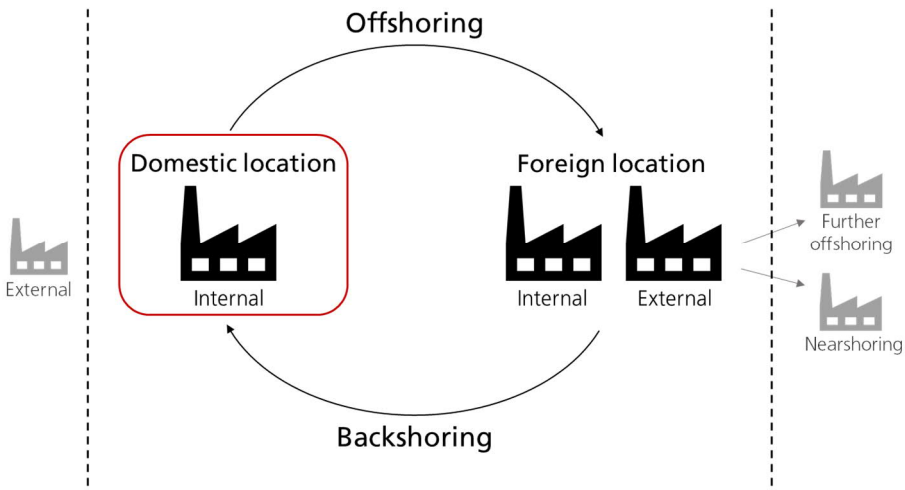

Figure 1 - Manufacturing relocation from and to the domestic plant

According to Gray et al. (2013), backshoring is ultimately a location decision. However, the manufacturing location/relocation decision includes two dimensions, the location aspect (in this case, the direction of the movement in terms of offshoring or backshoring) and the ownership aspect (the make-or-buy decision in terms of outsourcing or insourcing). Outsourcing was defined by Ellram and Billington (2001) as the transfer of the production of goods or services that had been performed internally to an external party. Although the decisions concerning location and ownership are

separate, they are faced by firms simultaneously and therefore, must be considered jointly to optimize the decision, according to Mudambi and Venzin (2010).

Jahns et al. (2006) made the first effort to clarify the different options of manufacturing strategies based on these two dimensions in their three by four matrix, with one axis being the legal dimension (Make-Hybrid-Buy) and the other axis being the geographic dimension (Onsite-Offsite-Nearshore-Offshore; Jahns et al., 2006). The 12 fields of the matrix visualizes the many options to consider for right-shoring, as discussed by (Joubioux and Vanpoucke, 2016). The matrix originally describes the different manufacturing strategies as the current state of the activity, and it has later been further developed and elaborated on to describe the movements between fields in the matrix (see e.g. Bals et al., 2016; Foerstl et al., 2016). The later version of the matrix is further build on in this thesis, where the focus is only on two aspects of direction and of ownership, namely offshoring versus backshoring and internal versus external, from the perspective of the domestic plant. Figure 2 displays the combinations of internal and external offshoring and backshoring, identifying four possible types of manufacturing relocation.

		Direction	
		Offshoring	Backshoring
Ownership	Internal	Captive offshoring	Captive backshoring
	External	Outsource offshoring	Insource backshoring

Figure 2 - Categorization of manufacturing relocation types

Captive offshoring indicates that manufacturing is relocated from a domestic plant to a foreign plant within the company's internal manufacturing network. Captive backshoring is the reverse move, when manufacturing is returned from a foreign plant within the company back to the original location. Outsourced offshoring implies that manufacturing is outsourced to an external manufacturer (supplier or contract manufacturer) in another country, while insource backshoring happens when manufacturing activities are returned to the domestic location from an external partner in another country. Studies have indicated that backshoring is primarily done in the captive mode, from a plant within the own manufacturing network (Bals et al., 2016; Wan et al., 2019a). Specifically, Wan et al. (2019a) showed that around three-quarters

of backshoring projects came from captive offshoring, while the remaining quarter was brought back from external partners.

International manufacturing relocation – related theories

Relocation of manufacturing has been explained by numerous theories from several research fields. Although it is usually studied from an operations management perspective, theoretical lenses are often borrowed from the field of international business, as that is where the most-developed theories for explaining international manufacturing are found. The most commonly cited theories and their relevance for offshoring and backshoring are elaborated on in the following sections.

In a systematic review of offshoring literature, Mihalache and Mihalache (2016) concluded that the most frequently used theory to explain offshoring decisions is transaction cost economics (TCE). TCE focuses on the make-or-buy decision, that is, under which conditions the firm should perform the activity internally, within the boundaries of the firm, and the conditions for when to outsource production and perform the activity externally. The theory proposes that firms will seek the solution that minimizes transaction costs, all while balancing the potential performance improvements against the perceived risks (Williamson, 1979; McIvor, 2013). Another commonly used theory for explaining the make-or-buy decision is the resource-based view (RBV; Mihalache and Mihalache, 2016). The RBV considers the firm as a bundle of assets and resources that can be used to create competitive advantages (McIvor, 2009). For a resource to be able to create these advantages, it must be valuable, rare, inimitable, and non-substitutable. If the firm does not possess the resources internally, they can be sourced from other locations and providers to gain competitive advantage (McIvor, 2009; Mihalache and Mihalache, 2016). Thus, TCE and the RBV are concerned with the make-or-buy decision, but while TCE focuses on the cost perspective, the RBV deals with the search for competitive advantage. Both theories have been influential in studies of outsourcing, but also offshoring, and have been argued to complement each other as neither theory alone can fully explain the decision to outsource (McIvor, 2009). One main argument for proponents of the RBV over TCE is that the RBV has a more positive view on the underlying motivations for manufacturing movements, in the sense that a firm aims to maximize its strategic resources that create competitive advantages rather than to minimize costs and negative opportunism as in the case with TCE (McIvor, 2009).

Another theory that has been widely used to explain multinational enterprises' (MNEs') foreign activities, and even been said to constitute the cornerstone of the current theory of MNEs, is the eclectic paradigm (Dunning, 2015). It has become one of the leading frameworks in international business research (Wiesmann et al., 2017) and has frequently been mentioned in studies on offshoring and backshoring (see e.g. Kinkel and Maloca, 2009; Ellram et al., 2013; Ancarani et al., 2015; Fratocchi et al., 2016). The eclectic paradigm is sometimes referred to as the OLI framework, as it presents three determinants that would explain international manufacturing and that need to be realized for a firm to engage in foreign value-adding activities: ownership advantages (O), location advantages (L) and internalization advantages (I; Dunning, 1980; Dunning, 1998; 2015). The eclectic paradigm builds on partial theories such as TCE and the RBV in an attempt to synthesize the essential features in international economic involvement (Dunning, 2015). The O advantages are intangible assets possessed by the firm, such as access to raw materials, economies of scale, patents, trademarks, management skills, coordination skills, etc., that are exclusive or specific to the firm in question. If it is beneficial for the firm to use O advantages rather than selling or leasing them to an external firm, they are internalized by including them in the internal value-adding chain, and they become I advantages. In contrast to O and I advantages, L advantages are external to the firm and include spatial distribution of natural resources, transportation and communication costs, infrastructure, language and cultural barriers, economic system, and government policies (Dunning, 2015). L advantages are further categorized into four groups of location factors that explain in more detail what attracts firms to different regions: resource-, market-, efficiency-, and strategic asset–seeking advantages. Resource-seeking advantages refer to access to raw materials, infrastructure, and local partners. Market-seeking advantages include access to domestic markets and the availability of local talent and suppliers. Efficiency-seeking advantages refer to low-cost production, industry clusters, and the removal of trade barriers. Finally, strategic asset–seeking advantages include knowledge-related assets, such as opportunities for the exchange of local tacit knowledge, and the understanding of market and consumer patterns (Dunning, 1998). The theory assumes that the three types of advantages (OLI) are spread unevenly across countries, industries, or enterprises, and that there is an interaction between them that changes over time and thus, changes the optimal configuration of the MNE (Dunning, 2015).

For the purpose of this thesis, the eclectic paradigm provides the most complete model for explaining the dynamics between offshoring and backshoring. TCE and the RBV provide only part of the explanation for manufacturing movements, as they focus on the ownership aspect (i.e., sourcing) rather than the pure location aspect (i.e., shoring) of manufacturing relocation. As the definitions of offshoring and backshoring imply,

they are concerned with where the manufacturing activities should be performed irrespective of the ownership aspect, which essentially makes them location decisions (Gray et al., 2013). The eclectic paradigm essentially examines FDI and thus, is appropriate for explaining offshoring. Even though backshoring represents foreign divestment rather than investment (Gray et al., 2013), this paradigm has also been used for backshoring because it considers a reconfiguration of the MNE to be a consequence of changes in the conditions that determine the optimal organizational structure, something that could also motivate the need to bring manufacturing back (Ellram, 2013). According to Fratocchi et al. (2016), backshoring can be driven either by changes in the characteristics of the home or host locations, that is, in the location advantages, or by a weakening of the ownership or internalization advantages on which the initial offshoring decision was based. However, studies on backshoring have primarily focused on the location factors in terms of location advantages (Ellram et al., 2013; Ancarani et al., 2015; Albertoni et al., 2017).

Another theoretical lens that has been applied to backshoring recently is contingency theory (Benstead et al., 2017; Moore et al., 2018). Contingency theory is an organizational theory suggesting that there is no best way to structure or manage an organization. Instead, the optimal solution is contingent on the context in which the organization operates, indicating that the organization should match its structures and processes to the environment to reach higher performance (Donaldson, 2001; Flynn et al., 2010). Thus, a fit between contingencies and the characteristics of the organization leads to maximized performance, while a misfit leads to poor performance. As contingencies change, organizations tend to adapt over time to maintain fit and avoid a loss in performance. In this way, organizations are shaped by the contingencies of their situation. This relationship between firm performance and the fit between the organization and contingency factors forms the core concern of contingency theory (Donaldson, 2001). Donaldson (2001) distinguished between three types of contingencies, each influencing a specific aspect of the organization; (i) environmental contingencies affect the mechanistic structure, (ii) organizational size influences the bureaucratic structure, and (iii) strategy affects the divisional structure. Thus, a change in any of the contingency types will, over time, lead to an adaption in the corresponding aspect of the organizational structure to regain fit and maximize performance (Donaldson, 2001). Contingency theory has been argued to be very relevant for the field of operations management. Since the field started maturing, there has been a shift in research focus, from identifying best practices to understanding the conditions under which such practices are effective (Sousa and Voss, 2008). In effect, it has been acknowledged that no practice has universal validity, and that more research on how the practice–performance relationship is influenced by contexts is needed.

Contributions of this type include identification of contingency factors that distinguish between contexts, categorization of contexts based on the identified contingency factors, and determination of the most effective practices in each category (Sousa and Voss, 2008).

The drivers of manufacturing relocation

Research on offshoring often takes a multi-dimensional perspective when investigating the motivations and drivers of the activity, considering interrelated trends in developed and emerging countries. Scholars have identified a number of potential offshoring drivers, such as getting access to new markets, seeking skills and knowledge, or getting access to innovation clusters (Porter, 2000; Jensen and Pedersen, 2011; Mihalache and Mihalache, 2016). Although there are several reasons to offshore manufacturing, empirical evidence concurrently points to cost improvement (primarily labor cost) as the number one reason for relocation of manufacturing to foreign regions (Lewin and Peeters, 2006; Kinkel et al., 2007; Lewin et al., 2009; da Silveira, 2014; Waehrens et al., 2015). Offshoring has even been referred to as a cost-reducing strategy (Mihalache and Mihalache, 2016). However, an important disadvantage of only using cost-based evaluation methods for the location decision is that these methods tend to focus on factor cost advantages, which are often temporary. Location strategies based on such aspects, for example, government regulation, tax systems, labor cost, and exchange rates, can quickly become obsolete when these factors change (MacCormack et al., 1994). In addition, decisions mainly based on cost considerations tend to ignore the long-term advantages more likely rendered by qualitative factors. Qualitative factors such as innovation, flexibility, and development are often central to creating a competitive advantage, while a cost-based strategy is easy for competitors to imitate (Lewin and Peeters, 2006; Waehrens et al., 2015). Implementation of skill-based technologies or the effectiveness of quality programs can be affected by the level of skills and knowledge embedded in the local workforce. Thus, local employee skills should be considered one of the key decision variables during location decision-making, especially for progressive manufacturing practices (MacCormack et al., 1994). However, scholars have indicated that most offshoring firms have no formulated corporate-wide relocation strategy. Lewin and Peeters (2006) showed that instead of a top-down strategy, the offshoring process more or less without exception starts with improvisations and experiments at the bottom-up level. This is unfortunate, as a corporate-wide offshoring strategy is important for post-relocation cost performance (Massini et al., 2010). Firms

with an offshoring strategy perform considerably better in terms of cost savings than firms without a strategy, according to Massini et al. (2010).

The drivers of backshoring has drawn much interest from academics (Barbieri et al., 2018). In contrast to offshoring, studies have shown that firms generally base their location decisions on a number of aspects other than cost. Early survey studies identified aspects related to competitive priorities, such as quality, flexibility, delivery, and access to skills and knowledge (see e.g. Kinkel and Maloca, 2009; Kinkel, 2012; Canham and Hamilton, 2013; Tate et al., 2014; Stentoft et al., 2015). These findings were confirmed by a recent survey study, indicating that the most common reasons for backshoring are the low quality of the goods produced abroad, the loss of flexibility, and unemployed capacities at home (Dachs et al., 2019b). Flexibility and quality concerns are, in particular, relevant for firms that move production back from Asian countries, according to Dachs et al. (2019b). As a complement to survey studies, several case studies have been conducted to gain deeper insights into the motivations for backshoring (see e.g. Martínez-Mora and Merino, 2014; Gylling et al., 2015; Robinson and Hsieh, 2016; Benstead et al., 2017; Baraldi et al., 2018; Di Mauro et al., 2018). They provide a more nuanced picture, adding drivers such as the made-in effect, strategy changes, changes in demand patterns, changes in cost factors, and cultural differences. What these studies all have in common is that they highlight contextual factors and changes in the conditions on which the initial location decision was based. Specifically, changes in cost factors between the offshore location and the home country have been mentioned as important drivers of backshoring (Martínez-Mora and Merino, 2014; Gylling et al., 2015; Gray et al., 2017). Thus, backshoring decisions are often based on reevaluations of the relative importance of location factors that changed over time (Tate et al., 2014; Ancarani et al., 2015). In many cases, location decisions are based on experience and biases rather than on a complete set of information (Gray et al., 2017; Hartman et al., 2017). For this reason, Hartman et al. (2017) suggested that decision-makers postpone the decision-making until they have complete information on which to base the decision. In contrast, Boffelli et al. (2018) found that managers find it inefficient and time-consuming to gather complete information before making backshoring decisions. Instead, managers believed it was more important to maintain ongoing communication with the host country to evaluate the uncertainties in advance. Further, Boffelli et al. (2018) found that many managers based their backshoring decisions on their feelings and other emotional aspects, in line with findings from previous studies (Canham and Hamilton, 2013; Benstead et al., 2017; Di Mauro et al., 2018).

In addition to the drivers mentioned above, the recent trends of the Industry 4.0 revolution as well as increasing demand for sustainability have been argued to drive

backshoring (Wan et al., 2019b). One stream of research has investigated the associations between backshoring and the technologies related to Industry 4.0 (I4.0), such as additive manufacturing, the industrial internet of things, automated production systems, the new generation of robotics, etc. (Brennan et al., 2015; Ancarani and Di Mauro, 2018; Fratocchi, 2018; Moradlou and Tate, 2018; Ancarani et al., 2019; Dachs et al., 2019a). The overall findings suggest that there is a positive connection between the adoption of I4.0 technologies and backshoring (Dachs et al., 2019a), and that additive manufacturing (Fratocchi, 2018) and production automation (Ancarani and Di Mauro, 2018), in particular, can act as enablers of backshoring. Specifically, Ancarani et al. (2019) found that the association between backshoring and I4.0 technologies is affected by a firm's competitive priorities. The association is strong when the backshoring firm competes on high quality, but there is no association when the firm competes on low cost or responsiveness. Arguably, the advanced technologies related to I4.0 provide higher flexibility and productivity that supports backshoring and acts as an incentive for firms to bring back their manufacturing activities to the domestic plant (Dachs et al., 2019a). As technologies are maturing, and adoption is widespread, I4.0 technologies may accelerate backshoring (Brennan et al., 2015). Another stream of recent research investigated the relationship between backshoring and environmental awareness and sustainability (Ashby, 2016; Sirilertsuwan et al., 2018; Fratocchi and Di Stefano, 2019; Orzes and Sarkis, 2019; Sirilertsuwan et al., 2019). A firm's sustainability is influenced considerably by the manufacturing location, and thus, backshoring decisions could be driven by responsiveness to increasing concerns for environmental and social sustainability. However, through a literature review, Fratocchi and Di Stefano (2019) clearly showed that environmental sustainability and social sustainability are not considered important drivers of backshoring, although there was some evidence that they are increasingly being acknowledged by practitioners and academics.

The effects on operational performance

Manufacturing relocations are made to capitalize on the comparative advantages in different regions, with the expectations that relocating will generate improved operational performance. In manufacturing strategy literature, operational performance is evaluated in relation to a firm's competitive priorities, usually measured in cost, quality, delivery lead time, and flexibility (Neely et al., 1995; Rosenzweig and Easton, 2010), but studies on offshoring also typically evaluate innovation capability (Mihalache and Mihalache, 2016). There are many studies on performance effects of

offshoring (see e.g. Jabbour, 2010; Mykhaylenko et al., 2015; Stentoft et al., 2018). These studies reported mixed results, ranging from positive to negative to no association at all between offshoring and improved performance. Mihalache and Mihalache (2016) concluded that there are no consistent positive results for offshoring, not for cost performance nor for innovation performance, which are the two performance measures most widely studied. Mykhaylenko et al. (2015) argued that the different results in previous studies could be explained by the context of the offshoring project. They found that different governance modes and types of offshoring activities yield different levels of access to offshore location specific advantages. This is in line with the findings of Jensen and Pedersen (2011) who suggested that there must be a fit between the relocated activities and the comparative advantages provided by the offshore region to reach a positive performance outcome. Further, Mykhaylenko et al. (2015) argued that many different combinations and set-ups can yield the same results, thus making it challenging to identify specific best practices of offshoring. One aspect that should be important for relocation outcomes is the motivation for offshoring, as it may determine the firm's choices and behavior (Mykhaylenko et al., 2015). Similarly, Roza et al. (2011) specifically called for an investigation of the impact of offshoring drivers on offshoring performance.

In terms of backshoring, there are still very few studies on its influence on performance outcomes. Repatriation of manufacturing activities is often discussed as a reaction to unsatisfactory performance at the offshore manufacturing site. For example, firms have reported that they experienced poor-quality production (Kinkel and Maloca, 2009), problems related to supply chain factors, or increasing operation costs (Ellram et al., 2013). Thus, backshoring is argued to be a remedy for these problems, and the backshoring discourse often assumes that backshoring by default is beneficial for performance. Early empirical evidence indicated that backshoring can be beneficial for cost performance (Robinson and Hsieh, 2016) and performance related to quality, delivery, and flexibility (Stentoft et al., 2015). In particular, Stentoft et al. (2015) showed that a vast majority of Danish backshoring firms improved their performance in terms of quality, flexibility, and ability to deliver, to a high or very high degree. However, more research on the performance effects of backshoring is needed.

The influence of contextual factors

As suggested in previous sections, the decision-making and performance effects of manufacturing relocation are influenced by contextual factors. Firms base their relocation decisions on, for example, the characteristics of the home and host locations,

aiming to leverage the comparable advantages of the manufacturing location (Kinkel, 2012; Ellram et al., 2013), and performance is contingent upon the fit between, for example, the activities' characteristics and the conditions offered by the local environment (Jensen and Pedersen, 2011). Only a few studies adopted a contingency perspective to explain differences in the decision-making process or the performance of backshoring; the exceptions were studies by Benstead et al. (2017) and Moore et al. (2018). Benstead et al. (2017) developed a contingency-based conceptual backshoring framework and found support for nine of their 11 proposed contingency factors in a case study, categorized as company, product, and behavioral factors. The framework was then further confirmed by Moore et al. (2018) who applied it within the textile and apparel industry. In addition to these specific studies based on contingency theory, survey studies provided some indications about the role of contextual factors, as these studies usually included aspects such as industry, firm size, and geography as control variables. In terms of industry, the most active backshoring firms within Europe are found in high-tech industries, such as the automotive industry, or electrical equipment and information and communications equipment (Dachs and Kinkel, 2013; Dachs et al., 2019b). In terms of firm size, manufacturing relocation is relevant for all sizes although it has been argued that large firms would dominate because they are more often members of global manufacturing networks (Kinkel et al., 2007; Roza et al., 2011; Waehrens et al., 2015). However, there are indications that there are differences in the relocation drivers between firms of different sizes. For example, large firms seem to offshore because of market-seeking factors to a larger extent than small firms (Kinkel et al., 2007). Finally, in terms of geography, Ellram et al. (2013) showed that the attractiveness of regions differs, and that the manufacturing location decision is influenced by the relative advantages and perceived risks of each region. The regions most commonly involved in manufacturing relocation from the European perspective are Eastern Europe, China, and the rest of Asia (Kinkel, 2012; Kinkel and Zanker, 2013; Stentoft et al., 2015).

In addition, recent literature investigated different aspects of the backshoring phenomenon to understand how they are relevant for the backshoring decision. Wan et al. (2019b) examined the relationship between backshoring and the home country, and argued that each country has its own unique characteristics that influence backshoring decisions, similar to the suggestion by Ellram et al. (2013). Their findings showed that backshoring projects differ in terms of industry, entry mode, firm size, and motivations, much in line with the advantages of the industrial landscapes within each country. For example, backshoring to Germany is more likely to be pursued by large firms in the mechanical sector, using a captive governance mode, and with the motivations of improving quality and delivery performance. In contrast, backshoring

to Italy is more likely to be pursued by firms in the clothing sector, motivated by the made-in effect. Lampón and González-Benito (2019) investigated how backshoring decisions are influenced by changes in the conditions at the home plant, specifically. The researchers found that improved key manufacturing resources may favor backshoring. For example, in low-tech industries, the value added per employee was higher at the time of backshoring compared to offshoring, and in high-tech industries, the technological level of production was higher during backshoring than at the time of offshoring. The authors concluded that this evolution of competences and manufacturing processes at the home plant reduces the complexity of the location decision in favor of the domestic location, making the level of competences and technological advancement at the domestic location important contingency factors for the backshoring decision. Further, Wan et al. (2019a) examined the factors influencing the entry mode choices of offshoring and backshoring. The results showed that industry factors and backshoring drivers such as government incentives were important for determining the backshoring entry mode. Similarly, Moretto et al. (2020) also investigated the influence of backshoring drivers on the governance mode and found a number of interesting patterns. First, backshoring firms that changed their governance mode from outsource to insource made this decision to regain control over the supply chain, improve flexibility, and get access to qualified workers. Second, backshoring firms that stayed in outsource mode were driven by lead-time reduction and a need for greater flexibility. Finally, firms that changed from the captive offshore mode to the domestic insource mode (thus keeping activities in-house all the time) were primarily motivated by the made-in effect. In summary, these recent studies on different aspects of backshoring showed that contingency factors are important for understanding the backshoring decision, and that more research is needed to improve our knowledge of the backshoring phenomenon.

RESEARCH DESIGN

The primary goal of conducting research is to make a contribution to knowledge (Karlsson, 2009). This does not mean that the contribution has to take the research field a major leap forward; most contributions are in fact minor. However, it is important to be aware of what is already known within the field, to make sure that the knowledge may qualify as a contribution. Depending on the maturity of existing knowledge within a field, the knowledge development may go through different phases. Research in early phases of knowledge development is often explorative, while research in later phases is normative and theory building. Consequently, research questions typically ask *what* is in the area to begin with, and later turn to find out *how* it is, and eventually ask *why*, what are the causes? (Karlsson, 2009). One essential issue in conducting research is to establish a logical chain of evidence, from research questions through method to contributions (Karlsson, 2009). As a researcher, it is of central concern to choose a research method that is appropriate to answer the research questions. Two commonly used methodologies within the field of operations management are surveys and case studies (Croom, 2009).

Although survey research is normally seen as a quantitative method, surveys can be used to collect both quantitative and qualitative data (Croom, 2009). This method is mostly suitable when the knowledge within the field is not too limited, and when the purpose is to investigate how variables are related and to what extent the relationships hold. A survey is also the most appropriate methodology when generalization is an important intended contribution (Forza, 2009). Survey studies can contribute to scientific knowledge in different ways and can be used for several different purposes, often distinguished as exploratory, confirmatory, and descriptive (Malhotra and Grover, 1998; Forza, 2002). *Exploratory survey research* is appropriate when the phenomenon of interest is novel and in early development, and when measures and concepts are still under-developed. Thus, the purpose is to gain preliminary insight into a topic, and the survey can help to identify concepts related to the topic and how to best measure them. A survey can also help to uncover preliminary evidence of associations between concepts. Alternatively, *confirmatory survey research* is conducted when concepts, models, and propositions are well developed and formulated in a theory. The purpose is to test the relevance of the articulated theory and hypothesized associations between

concepts. Finally, *descriptive survey research* aims at gaining more knowledge about the relevance of a certain phenomenon and describing its distribution in a population. The findings can be used for theory building or refinement, although it is not the primary purpose (Forza, 2002). The contribution from survey research is highly dependent on the execution. In contrast to, for example, case research, the structure of the process makes it difficult to go back and complement the retrieved information with additional questions (Forza, 2009). Therefore, careful consideration of previous literature and theoretical concepts and a well-designed survey instrument are essential.

Case research is generally considered a quantitative method with an interpretative research approach, with its roots in social sciences (Croom, 2009). This method is particularly useful for early, exploratory investigations when there is no or very limited knowledge about the phenomenon, and variables are unknown. Thus, case studies have been a powerful research method for theory development within the field of operations management (Voss, 2009). They answer questions such as how and why, and give the possibility to understand the nature and complexity of the phenomenon in depth, in a real-life setting (Yin, 2014). Exploratory surveys complement the knowledge gained through case studies and help push forward the development of measures for different contexts. However, if the aim is to explain the theorized relationships between variables, surveys may fall short in the level of detail needed for in-depth understanding. Thus, case studies and survey research are complementary in exploratory and theory-building research (Forza, 2009).

Overall research design and structure

The purpose of this thesis is to contribute to the knowledge of the phenomenon of backshoring. Backshoring is a relatively new occurrence, which means that the level of knowledge is quite low. However, when this research project began, a number of case studies had been performed, providing preliminary insights into the phenomenon. In addition, international manufacturing in general and offshoring in particular had been researched to a larger extent, providing many parallels to draw from in terms of key concepts and variables. To gain further insights into backshoring, and to uncover preliminary evidence of the associations between offshoring and backshoring, an exploratory research approach was deemed appropriate. Additionally, the purpose was to test whether general theories regarding location decisions were applicable in backshoring. Thus, a large-scale survey study was conducted to generalize the results over a larger population. The survey was mainly exploratory but included elements for

description as well as confirmation. The survey study resulted in three publications appended to this thesis.

The findings from the survey study provided novel insights into the relationship between offshoring and backshoring, identifying and defining variables such as drivers, outcomes, and contexts, which could be generalized within a larger context. However, they also generated additional questions and an urge to gain a deeper understanding of the complex interrelatedness between the processes. This is the main limitation with survey research compared to case study research, as highly structured questionnaires limit the possibilities for follow-up questions and further exploration (Forza, 2009). Thus, a second study was initiated, with the purpose of gaining in-depth knowledge from case studies.

Generally, case studies are an exceptional source of rich material, and they have made substantial contributions in a number of fields. However, case studies can reach disparate conclusions, and the knowledge produced often tends to remain a stand-alone work with little or no accumulation of knowledge (Hoon, 2013). In terms of backshoring research, a dominant part of the published studies was case studies when the second study of this research project began. They had made significant contributions to the emerging field, but their contributions were fragmented. Thus, to discover complexities and nuances that cannot be obtained from individual case studies, the second study of this thesis was based on a systematic literature review of previously published case study research, resulting in two different types of meta-analyses. A meta-analysis is particularly suitable when (i) a specific methodology, such as case study research, dominates a field, (ii) when the study object is the organization, and (iii) when there is a broad range of conditions of interest (Hoon, 2013; Lewis, 1998). Thus, a meta-analysis is of high interest for the field of backshoring in general, and for the purpose of this study in particular. By revisiting the findings of other researchers, the purpose was to accumulate produced knowledge and therefore, accelerate the progress of the field, as suggested by Goldsby and Autry (2011). Accordingly, the second study of this thesis involved theory building, attempting to explain the offshoring and backshoring processes by identifying the constituent elements and explaining how they relate to each other. The study resulted in two papers appended to this thesis.

Thus, this thesis includes five appended papers. In Figure 3, a graphical illustration of the research conducted for this thesis is displayed, including the two studies, the methodologies applied, and the output in terms of appended papers.

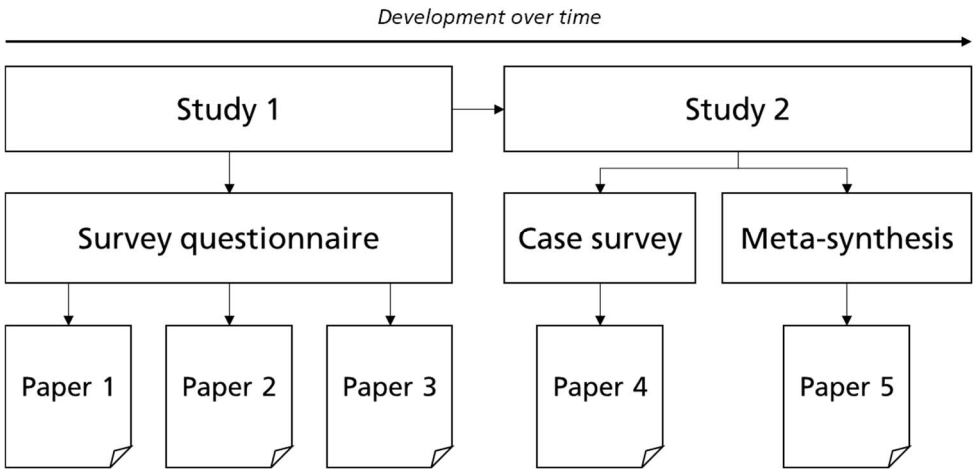

Figure 3 - Overview of research structure and output

Linking appended papers to research questions and design

The five papers fulfill the purpose of the thesis together, by contributing with results related to different aspects of the research questions. The papers serve different scientific purposes and are based on different research methods, as described above. Table 2 shows how each paper is related to the research questions and research design.

Table 2 - Linking appended papers to research questions and research design

	Paper 1	Paper 2	Paper 3	Paper 4	Paper 5
Research questions covered					
RQ1 - The Swedish perspective	x				
RQ2 - The drivers of relocation	x	x	x	x	x
RQ3 - The effects on operational performance	x	x	x		x
RQ4 - The influence of contextual factors				x	x
Research purpose					
Exploration	x	x	x		
Description	x				
Theory testing		x			
Theory building				x	x
Research method					
Empirical - Survey	x	x	x		
Systematic literature review - Case survey				x	
Systematic literature review - Meta-synthesis					x

Paper 1 describes recent manufacturing relocations in Sweden and explores the similarities and differences between offshoring and backshoring by providing data about the extent, motivations, and benefits of relocation. At the same time, the paper establishes the relevance of studying relocation in the context of Swedish manufacturing industry, as the survey data proves that Swedish plants have been very active in offshoring and backshoring. Papers 2 and 3 were produced in parallel, both investigating how drivers of the manufacturing location decision can be logically bundled, but from contrasting perspectives. The papers are based on survey data, and the aims were to first test whether available theory is applicable and then to see how drivers would be grouped if the data is allowed to lead the bundling. Thus, Paper 2 is theory testing, while Paper 3 is exploratory. Additionally, both papers explore the relationships between bundles of relocation drivers and operational performance, thus providing valuable insights into the benefits obtained after manufacturing was relocated based on different decision drivers. Papers 4 and 5 extend the scope of the thesis by studying the role of contextual factors for manufacturing relocation. Paper 4 examines the relationship between contextual factors and drivers of the relocation decision, based on a case survey of previously published case studies. In Paper 5, a comprehensive framework for backshoring is presented, aiming to incorporate all elements that should

be described and investigated to fully understand the backshoring phenomenon. Papers 1, 2, and 3 are mainly exploratory, as well as theory testing. Papers 4 and 5 aim to build theory by accumulating knowledge from previous empirical research and thus, identify and link key variables of the backshoring phenomenon. The survey study and the meta-analyses are described in detail in the following sections.

Study 1 – Survey study

Papers 1–3 are based on data collected in a large-scale survey among the manufacturing industries in the Nordic countries Sweden, Finland, and Denmark. The purpose of the survey was to investigate the extent, drivers, and outcomes for offshoring and backshoring of manufacturing from and to the Nordic countries, as well as to compare how the two relocation directions are managed and what are their outcomes. The unit of analysis in the survey study was relocation to and from the domestic plant, because previous studies indicated that location decisions are commonly made at the lower levels of the organization (Lewin and Peeters, 2006). As this was the first backshoring study of this nature, the survey was largely exploratory, but with some elements for description and confirmation. The survey development was preceded by a literature review of current backshoring literature, which also provided the foundation for the specific survey questions. In addition, the survey was inspired by a similar survey study conducted previously in Denmark, by one of the participants in the research project. However, the literature review and the survey development were performed before the thesis author joined the project.

The questionnaire

The survey and related data collection were designed following the guiding principles for survey research presented by Forza (2002; 2009) and Malhotra and Grover (1998), described in detail in the following sections. The survey consisted of 229 item questions and covered three levels of manufacturing-related issues in the company: (i) the company and its manufacturing network, (ii) the recent offshoring and/or backshoring decisions, and (iii) general data concerning the focal plant and the respondent. Offshoring and backshoring were treated separately, meaning that the backshoring projects were not specifically related to a previous offshoring project. However, the same set of questions were used for offshoring and backshoring, providing a unique data set with the possibility to compare the two relocation directions in multiple perspectives. The survey questions were based on previous survey studies on offshoring

and backshoring (Kinkel, 2012; Canham and Hamilton, 2013; Tate et al., 2014; Stentoft et al., 2015), to ensure high validity of the study. The questionnaire asked about manufacturing relocations between 2010 and 2015, and included two types of questions: multiple-choice questions and questions with perceptual five-point scales. The respondents were asked to answer from the perspective of the focal plant, and to answer the perceptual questions intuitively as they concerned the perceived state of things. There was also the possibility to respond N/A (not applicable), if the question did not apply to the situation at the plant. In addition, for some questions there was the possibility to add an item to the question or give a motivation in text. However, there were only a few additions, and they did not gain enough support to be included in further analyses.

The survey was developed in English and later translated into the native languages of the three participating countries. Respondents were given the possibility to choose which version to respond to. To ensure high validity of the survey constructs and questions, it was pre-tested in the three countries with researchers and practitioners who are experienced survey researchers. The test panels suggested only some minor corrections, which were incorporated in the final version of the survey. The complete survey questionnaire can be found in Appendix I. The questionnaire was released in September 2015, and data collection took place during the two months of September and October 2015, simultaneously in the three Nordic countries. The project group in each country was responsible for data collection in the respective country.

The sample

The target group of the survey was all manufacturing plants with more than 50 employees, in all manufacturing industry categories (Standard Industry Classification codes 10–33). Previous survey studies had indicated that plants with fewer than 50 employees reported very low levels of manufacturing relocation activity (Kinkel, 2012; Canham and Hamilton, 2013), and thus, these plants were excluded from the target group. The individuals in the target group were identified through the national register of statistics in each country, which provided basic plant data and contact information. In Sweden, data was drawn from Statistics Sweden (the Swedish Central Bureau of Statistics). In total, the target group consisted of 4601 plants, distributed per country as follows: 1637 Swedish plants, 949 Finnish plants, and 2015 Danish plants. All plants in the target group were contacted, avoiding the difficulties with sample design and thus, increasing the possibilities of generalizing the results (Forza, 2002). As data was collected from a single informant per plant, all plants with more than 100 employees were contacted by telephone to make sure that we found an experienced, knowledgeable

respondent willing to participate. These respondents then received the survey electronically, directly sent to the email address specified on the telephone. Plants with fewer than 100 employees received the survey via regular mail without previous contact, but also had the option to answer the survey electronically. After two reminders, the survey was closed. The responses were initially examined, and the data was cleaned to ensure its quality; responses from companies with fewer than 50 employees, very incomplete answers, and/or distorted responses (e.g., similar responses to all items) were removed. For the Swedish data set, missing data was obtained by contacting the respective respondent again, asking for complementary answers. In total, 847 acceptable responses were received, which corresponded to a response rate of 18.4 percent (22.8 percent in Sweden), in line with related surveys in the manufacturing industry (e.g. Kinkel and Maloca, 2009). Not all respondents had relocated manufacturing during the surveyed period. From the 847 responses, we received data about 275 offshoring projects and 160 backshoring projects. Table 3 displays the distribution of answers per country, including the corresponding response rates and the number of offshoring and backshoring projects.

Table 3 - Distribution of respondents and number of relocations across countries

	All countries	Sweden	Finland	Denmark
Population	4601	1637	949	2015
Sample size	847	373	229	245
Response rate	18.4%	22.8%	24.1%	12.2%
Offshoring projects	275	133	59	83
Backshoring projects	160	99	30	31
Total number of relocations	435	232	89	114

A central concern of statistical conclusions is related to the statistical power of the test performed (Malhotra and Grover, 1998). The single most important factor for establishing acceptable power for a test is the sample size, which should be at least 100, or five times the number of variables in the tested model (Malhotra and Grover, 1998). With a sample size of 847 (or 373 in the Swedish data set), the statistical power of this study was considered to be established.

The three countries have similar industrial environments, but there were some differences in the sample in terms of size and industry membership; see Table 4. Sweden has a relatively higher share of large firms compared to Finland and Denmark, and Denmark is stronger within the food industry, but this is in line with the differences between the countries. The representativeness of the sample was investigated by comparing the sample with the population in terms of plant size and type of industry.

The sample has a slight bias toward larger plants, even if many more small plants responded to the survey. The sample correlates quite well with the population in terms of industry, but the food and timber industries are slightly underrepresented in the sample, while the machine and engineering industries are somewhat overrepresented. Overall, the sample was considered a good representation of the industries in Sweden, Finland, and Denmark.

In terms of the respondents' experience, their job positions reflected the expected target group. The respondents included production managers (42.1 percent), plant directors or managers (29.4 percent), global operations directors or managers (10.4 percent), supply chain directors or managers (8.2 percent), and others (9.9 percent). On average, the respondents had nearly 16 years of experience in production or operations management, and they had worked in their current job position for more than six years. Thus, they were assumed to be knowledgeable about the most recent offshoring and backshoring projects at the plant, as well as the other issues covered by the survey.

Table 4 - Distribution of respondents in terms of size and industry (numbers in percentages)

Characteristics	All countries	Sweden	Finland	Denmark
Plant size (no. of employees)				
Less than 100	46.1	34.2	51.1	59.5
101-250	36.1	45.7	28.8	28.1
251-500	9.5	9.5	11.9	7.4
More than 500	8.3	10.6	8.2	5.0
Industry sector (SIC code)				
Machinery industry and equipment (28)	18.8	17.4	22.7	17.1
Fabricated metal products (25)	11.2	10.7	14.8	8.6
Food industry (10)	10.5	7.5	6.1	19.2
Electrical equipment (27)	6.4	7.0	6.6	5.3
Other non-metallic mineral products (23)	6.0	4.6	4.8	9.4
Rubber and plastics industry (22)	5.7	5.6	5.7	5.7
Chemical industry (20)	5.4	5.9	7.0	3.3
Computer, electronic and optical products (26)	5.4	5.1	6.1	5.3
Timber industry (16)	5.3	5.1	5.7	5.3
Paper industry (17)	4.1	6.2	2.6	2.4
Motor vehicle, trailer and semi-trailer (29)	3.5	5.4	2.2	2.0
Basic metals industry (24)	3.0	4.8	1.7	1.2
Furniture industry (31)	3.0	2.7	2.2	4.1
Other industries	11.7	12.1	11.8	11.0

Data analysis

All data analyses were conducted with IBM SPSS Statistics 24. To ensure the data quality, for each study, all items included in the analyses were tested for non-response bias and common method bias. In addition, the survey did not disclose the constructs to the respondents to minimize response bias. Non-response bias was tested with t-tests for comparison of the mean values of the first 25 percent of responses with the last 25 percent, in line with wave analysis recommended by Armstrong and Overton (1977) and (Lambert and Harrington, 1990). In wave analysis, later respondents or respondents who require reminders are assumed to answer like non-respondents, and their answers are compared with the answers of early respondents. Only a few items showed a slight bias. For example, for four out of 56 drivers, the late respondents rated the importance of the drivers, on average, lower than the early respondents, indicating that non-respondents considered the drivers unimportant. However, overall, non-response bias did not seem to be a problem in the data set. Common method variance was also tested by using Harman's one-factor test, described by Podsakoff et al. (2003). Thus, for each study, all relevant items were analyzed with an exploratory factor analysis (EFA), of which the un-rotated factor solution was examined to determine the number of factors that accounted for the variance in the variables. The basic assumption of this test is that if a considerable amount of common method bias is present, either one single factor will emerge or one factor will account for the majority of the covariance among the variables. Again, the results differed slightly depending on which items were tested. Overall, Harman's one-factor test did not indicate that the data set suffered from common method bias. To further ensure the quality of the data in terms of common method variance, anonymity was guaranteed to the respondents of the survey, and predictor and criterion variables were separated in the survey design, per recommendations (Podsakoff et al., 2003). In terms of data analyses for the specific purposes of each appended paper, the statistical tests performed are summarized in Table 5.

Table 5 - Statistical tests performed using survey data

Statistical test	Type of variables	Used in Paper	Purpose of test
T-test of means	Scale variables	Papers 1–3	To compare different aspects of manufacturing relocation between offshorers and backshorers
Exploratory factor analysis	Scale variables	Paper 3	To reduce the number of variables by identifying the abstract, unobserved variables
Confirmatory factor analysis	Scale variables	Paper 2	To test theory of major site location factors, in terms of fit between the theoretical model and empirical data
Multiple regression analysis	Dependent: Scale; Independent: Scale; Control variables: Nominal and ordinal	Paper 2 and Paper 3	To investigate the associations between variables, in terms of drivers and performance effects

Study 2 – Systematic literature review and meta-analyses

Papers 4 and 5 present the results of two different types of meta-analyses, the case survey and the meta-synthesis, both based on a systematic literature review of previously published case studies. The content analyses were based on different sets of data from the same set of articles, which were identified through a structured literature search. This section describes the literature review, while the next sections describe the different methodologies in detail.

Recent literature recognized a strong path dependency between offshoring and backshoring, indicating that the backshoring decision can be based on previous offshoring outcomes, and that the two relocation directions, thus, should be studied together (Kinkel and Maloca, 2009; Gray et al., 2013; Barbieri et al., 2018). The unit of analysis in the literature study was the two connected events, that is, offshoring and backshoring at the plant, with offshoring considered an antecedent of backshoring. To identify all relevant literature for the study, a search strategy was developed, aiming to find case study research on the backshoring phenomenon, including descriptions of the preceding offshoring process. Figure 4 illustrates the search process.

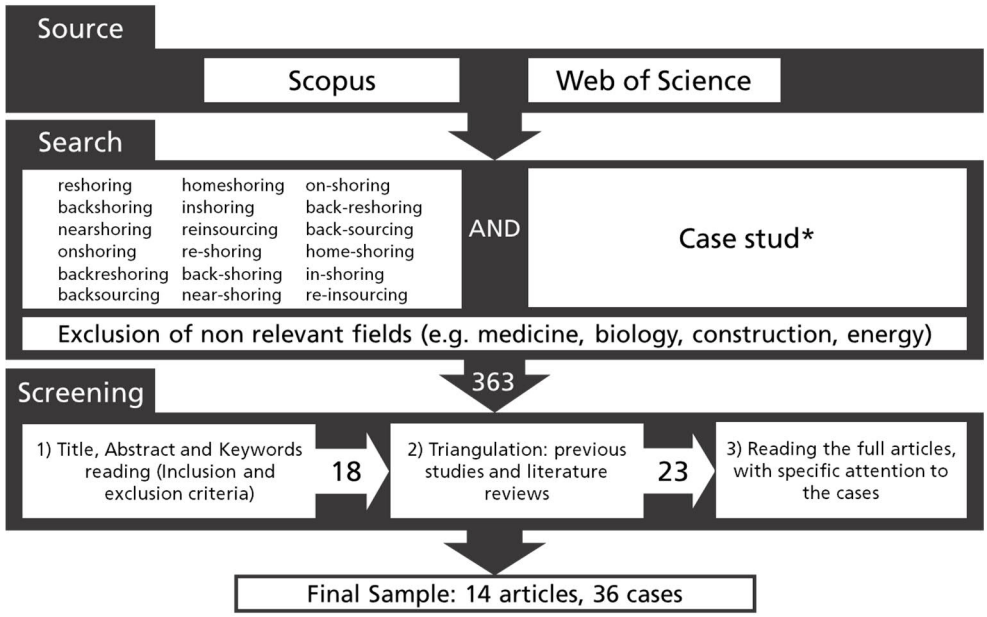

Figure 4 - Literature search process

The sample of potentially relevant literature was retrieved from Scopus and the Web of Science, which have been used in previous literature reviews (Stentoft et al., 2016b; Wiesmann et al., 2017; Barbieri et al., 2018). To increase scientific rigor and identify peer-reviewed sources with strong academic contributions relevant to synthesize (rather than merely illustrative examples of manufacturing relocation), unpublished works were discarded. The search terms "case study" and "backshoring" (as well as related terms identified in literature; see Figure 4) were used and applied in the fields *title/abstract/keywords* in Scopus and *topic* in the Web of Science. The literature search resulted in an initial sample of 363 articles. A set of clearly specified selection criteria were applied to the initial sample, reducing the set of relevant articles to 18. The selection criteria are displayed in Table 6.

Table 6 - Selection criteria for literature search

Characteristic	Selection criteria
Relocation direction	Offshoring and subsequent backshoring
Constructs	All definitions of backshoring, reshoring, etc.
Governance mode	All governance modes
Type of activity	Only manufacturing
Methodology	Only case-based research
Content	Provide sufficient information to be analyzed
Time	No time delimitations
Research field	Business management and accounting; Decision science; Economics econometrics and finance; Engineering (only industrial and manufacturing); Social science
Source type	Peer-reviewed sources
Document type	Article, Book chapters
Language	English

The selection criteria focused on articles from peer-reviewed sources that used case-based methodologies, including offshoring and subsequent backshoring decisions for manufacturing activities. Thus, conference papers, articles focusing on non-manufacturing activities (e.g., services or IT), and studies using other methodologies were excluded. The search result was triangulated with available systematic literature reviews on backshoring. This resulted in the inclusion of five additional articles, making the sample 23 articles in total. However, after both researchers had individually read all the articles in the sample, another nine articles were excluded from the sample, as they did not report enough information to be analyzed. Thus, the sample included 14 articles with a total of 51 cases. Some cases described in the articles did not include backshoring, meaning that the case firm had offshored manufacturing but never brought it back. The total number of cases of offshoring *and* subsequent backshoring identified in the articles was 36. The final list of articles is displayed in Table 7, including the number of analyzed cases in each article.

Table 7 - List of articles, including number of analyzed cases

Authors	Title	Journal/Book	Cases
Martínez-Mora and Merino (2014)	Offshoring in the Spanish footwear industry: A return journey	Journal of Purchasing and Supply Management	8
Gylling et al. (2015)	Making decisions on offshore outsourcing and backshoring: A case study in the bicycle industry	International Journal of Production Economics	1
Joubioux and Vanpoucke (2016)	Towards right-shoring: A framework for off-and re-shoring decision-making	Operations Management Research	2
Robinson and Hsieh (2016)	Reshoring: A strategic renewal of luxury clothing supply chains	Operations Management Research	1
Stentoft et al. (2016a)	Flexicurity and relocation of manufacturing	Operations Management Research	1
Benstead et al. (2017)	Why and how do firms reshore? A contingency-based conceptual framework	Operations Management Research	1
Gray et al. (2017)	Why in the world did they reshore? Examining small to medium-sized manufacturer decisions	Journal of Operations Management	5
Nujen and Halse (2017)	Global shift-backs: A strategy for reviving manufacturing competences	Breaking up the Global Value Chain	1
Baraldi et al. (2018)	A network perspective on the reshoring process: The relevance of the home- and the host-country contexts	Industrial Marketing Management	1
Di Mauro et al. (2018)	Offshoring and backshoring: A multiple case study analysis	Journal of Purchasing and Supply Management	3
Engström et al. (2018)	Reshoring drivers and barriers in the Swedish manufacturing industry	Journal of Global Operations and Strategic Sourcing	4
Nujen et al. (2018)	Managing reversed (global) outsourcing– the role of knowledge, technology and time	Journal of Manufacturing Technology Management	2
Nujen et al. (2019)	Backshoring readiness	Journal of Global Operations and Strategic Sourcing	1
Sayem et al. (2019)	Investigating the influence of network-manufacturing capabilities to the phenomenon of reshoring: An insight from three case studies	BRQ Business Research Quarterly	5

Case survey

The case survey conducted in Paper 4 was a quantitative meta-analysis methodology, using data from previously published case studies to make statistical inferences that can be generalized over a larger population. Thus, the paper combines the advantages of the in-depth case study methodology with the strengths of survey research (Larsson, 1993; Combs et al., 2019). The main task of a quantitative meta-analysis is to aggregate the characteristics of a group of case studies, but not necessarily their conclusions (Combs et al., 2019). Thus, in Paper 4, the focus was on the descriptions of the cases, rather than on the analyses and conclusions of the original authors. Therefore, the focus of the case survey was the 36 identified cases of offshoring and subsequent backshoring. There are four main steps of the case survey: (i) identify existing case studies relevant to the research questions, (ii) design a coding scheme for systematic conversion of the qualitative case descriptions into quantified variables, (iii) use multiple coders and measure their interrater reliability, and (iv) statistically analyze the coded data (Larsson, 1993). The purpose of the study was to investigate the influence of contextual factors on the relocation decision-making. Previous studies had indicated that the preceding offshoring decision could be a contingency factor influencing how the backshoring decision is managed (Benstead et al., 2017); thus, the study aim was also to investigate the relationship between offshoring drivers and backshoring drivers. Therefore, a coding scheme including all the contingency factors and relocation drivers identified in the 36 case descriptions was developed during the first round of reading. This resulted in a final list of five contingencies and 25 drivers, identical for offshoring and backshoring. During the second round of reading, cases were coded according to the coding scheme, using one if the item was identified in the case, and zero if it was not. The five contingency factors were identified in most cases. However, some drivers were not relevant for both offshoring and backshoring. Thus, the coding resulted in a list of 12 drivers relevant for offshoring and 22 drivers relevant for backshoring (i.e., identified in at least one case). Many of the drivers were identified in only one or a few cases. Thus, in the succeeding analyses, only the drivers with four or more observations were included, which means that the final lists of drivers included seven offshoring drivers and 16 backshoring drivers.

To avoid any potential bias during the process, two researchers were involved in all the phases, and results were discussed after each phase with experienced researchers. During the second round of reading, two researchers independently coded the primary studies according to the coding scheme, reaching interrater agreement of 83 percent. Then, the databases were merged, and contradictory coding results were discussed with a consensus resolution approach.

The data was analyzed with IBM SPSS Statistics 25. Preferably, the coding should have resulted in scale variables that allow for parametric tests, but the limitations of the data in the cases did not allow to assess the importance of the drivers on scales. Thus, the coding was designed to provide nominal variables, and the statistical analyses had to be adapted to the data. The associations between contingency factors and relocation drivers were investigated by performing maximum likelihood ratio chi-squared tests for each pair of contingency factor and relocation driver. The relationship between offshoring drivers and backshoring drivers was investigated by performing a hierarchical cluster analysis. The clusters were created based on the variables, which allowed to clearly identify which offshoring and backshoring drivers were connected, that is, belonged to the same cluster. Because of the nature of the data, it was possible to draw conclusions about the causality between offshoring and backshoring decision-making. This was an absolute novelty of the study.

Meta-synthesis

The meta-synthesis performed in Paper 5 was an exploratory, inductive methodology aimed to make contributions beyond those presented in original, qualitative case studies and thus, build theory (Hoon, 2013). A meta-synthesis has been described as an "analysis of the analyses," as it focuses on the insights and interpretations of the original authors, rather than on the primary data about the specific cases. Thus, the data was analyzed at the article level, focusing on the discussions and analyses in the 14 identified articles. There are different variants of meta-synthesis, as described by Hoon (2013). In Paper 5, the aggregation synthesis was used to develop a comprehensive framework for backshoring, based on published backshoring case studies. The aggregation synthesis aims to generate interpretative explanations and accumulate knowledge by identifying categories and patterns from the studies investigated. It involves the following seven steps, as described by Hoon (2013):

1. Framing the research question
2. Locating relevant research
3. Establishing inclusion criteria
4. Extracting and coding data
5. Analyzing on a study-specific level
6. Synthesizing on an across-study level
7. Building theory from meta-synthesis

The purpose of the study in Paper 5 was two-fold. The first aim was to develop a comprehensive backshoring framework for describing and studying the phenomenon of backshoring. The second aim was to use the meta-synthesis to aggregate the knowledge about the topic, by gathering insights from multiple fields. Thus, the study was clearly framed, and an initial backshoring framework was developed based on previous literature. A two-level coding scheme was developed based on suggestions by Durach et al. (2017). The first-level coding mapped the characteristics of the articles, while the second-level coding followed the main elements of the initial framework. The focus of the second-level coding was on the findings, discussion, and conclusion sections, and the coding and analysis were made iteratively in two phases according to Hoon's (2013) guidelines. After the first round of coding, the framework was refined based on the evidence found in the articles, and new elements were added. The second round of coding followed the updated coding scheme, which served as the basis for the final backshoring framework. NVivo Plus 12 software was used to keep track of the coding process and to support the data analysis. Both researchers were involved in all phases, and the results were discussed with senior researchers, experienced in the field, after each phase. The primary studies were coded by the researchers independently, reaching an interrater agreement of 83 percent. Then, the two databases were merged, and contradictory coding results were discussed with a consensus resolution approach (Larsson, 1993). The data analysis was primarily performed by evaluating the single article coverage of each element in the coding scheme, as well as investigating the level of cross-coding between elements (i.e., how often codes appeared together). These analyses were performed with NVivo Plus 12 software, and they confirmed the relevance and coverage of the developed framework. In addition to the analyses of the coded information, mind-maps of each article were developed, which favored discussion among researchers and identification of patterns (Seuring and Gold, 2012). The mind-maps were also used to identify illustrative cases when the framework was populated during the final step of the analysis.

Research quality

When conducting survey research, one of the major concerns is how to establish measurement quality (Forza, 2002). It is normally evaluated in terms of validity (measuring the right concept) and reliability (stability and consistency in measurement), ensured during the entire survey process. This includes the design of the survey instrument, as well as the procedures used to measure the constructs of interest, of which the most critical is the measurement of complex multi-item

constructs. In addition to the measures taken during the survey development and data collection described above, validity and reliability are further discussed in the following sections. The validity of a meta-analysis depends on the quality of the primary studies analyzed (Hoon, 2013). Thus, the literature review was carefully designed with relevant selection criteria, to identify high-quality articles. In addition, several researchers were involved in all phases, through the literature search, coding, and analyses of the articles, to reduce researcher bias.

Construct validity

Construct validity measures whether the operational measures used are appropriate for an abstract construct (Flynn et al., 1990). In survey studies, construct validity is most commonly measured with factor analysis. Exploratory factor analysis is used to identify tentative dimensions, showing whether all items load on the same construct or whether they measure more than one construct. The sample size must be at least 10 responses per item of the construct (Flynn et al., 1990). Confirmatory factor analysis is used to establish construct validity in theory testing studies. The number of constructs is determined before the analysis, based on theory, and the test investigates whether the data fits the theory or not (Flynn et al., 1990). In this thesis, high content validity (which is a pre-requisite for construct validity; Forza, 2009) was established by basing all constructs on previous literature, specified in detail in each appended paper. The questionnaire was pre-tested with experienced researchers and practitioners to ensure high validity of the questions. Factor analyses were performed in the relevant papers, where factor loadings and model fit values assured acceptable construct validity through acceptable unidimensionality and convergent validity.

Internal validity

Internal validity concerns the possibility to establish a causal relationship between variables, that is, whether the differences in the dependent variable are caused by the independent variable or whether there could be other variables that are relevant for the variation (Malhotra and Grover, 1998). In survey research, internal validity is normally established by including control variables, but it is also important to justify internal validity with a discussion of the plausibility of the relationship between variables, and thus, eliminate alternative explanations (Malhotra and Grover, 1998). In this study, the survey questions were formulated to indicate a causal relationship between drivers and benefits, and control variables were included to rule out the possibility of inference from other variables. In addition, results were discussed in light of previous research. For the meta-analysis in Paper 4, the nature of the data makes it possible to investigate

the causal relationship between offshoring and backshoring decision-making as we included only studies that described the offshoring decision as well as the subsequent, related, backshoring decision.

External validity

External validity refers to the possibility to generalize the results beyond the sample (Malhotra and Grover, 1998). As the survey queried the entire population, there is no built-in sample bias in the survey study. However, it is important to discuss the characteristics of the Nordic countries to be able to generalize the results across other regions. The geographic setting of the survey is a limitation of the study, which is discussed further in the final chapter of the thesis.

Reliability

Reliability measures the ability to replicate the study with the same results (Flynn et al., 1990). One way to evaluate reliability in survey research is through the internal consistency method, in which Cronbach's alpha is the most widely used reliability indicator (Forza, 2002). It measures the inter-item correlation among the items of the construct and is normally accepted when the alpha coefficient is above 0.7. However, for new constructs a value above 0.6 can be accepted (Hair et al., 2010). Cronbach's alpha was used to evaluate the reliability of the constructs in the relevant appended papers. In addition, the survey, its questions, data, and analyses are well-documented and archived in Microsoft Excel and SPSS to offer the possibility of study replication. Similarly, the meta-analyses are well-documented, transparent, and systematic, ensuring the possibility for replication (Hoon, 2013).

SUMMARY OF APPENDED PAPERS

In this chapter, the five appended papers are briefly described, the main results from each paper are related to the research questions, and the contributions of each paper are summarized.

Paper 1

Title: Manufacturing relocation through offshoring and backshoring: The case of Sweden.

Backshoring brings hopes of new job opportunities and a revitalization of the domestic manufacturing industry in Sweden. At the beginning of this research project, however, there was still limited empirical evidence of a Swedish "backshoring trend." In addition, previous studies had indicated, without statistically proving it, that there are differences in how offshoring and backshoring are managed by firms, in terms of the type of production that is being relocated, as well as the motivations and experienced benefits.

In this paper, we analyzed survey data and explored how the Swedish manufacturing industry had been affected by recent offshoring and backshoring activities. First, we used descriptive statistics to show the extent of manufacturing relocation in both directions as well as the geographic areas involved. Second, we compared offshoring and backshoring in terms of type of production, drivers, and benefits, to find statistically significant differences between offshoring and backshoring groups.

The results of Paper 1 indicated that Swedish firms were very active in offshoring and backshoring during the surveyed five-year period, as 35.7 percent of the responding plants reported offshoring while 26.5 percent reported backshoring. From the data, we concluded that almost twice as much manufacturing had been offshored from Sweden compared to what had been backshored. In terms of size effects, the results indicated that a backshoring project is equivalent to an offshoring project, based on the number of full-time employees. In terms of ownership, backshoring was done to an equal extent from internal and external parties, while offshoring was more extensively done from within the own manufacturing network, thus indicating that Swedish firms have a global presence with factories in many regions in the world. The characteristics of the

production activities could be defined as labor intensive for offshoring and complex for backshoring, in line with the general perception that labor costs in Sweden are high, as is the level of skills and knowledge. The geographic areas involved were mainly Europe and China, in both directions. Other regions accounted for relatively few relocations. These results address the first research question of this thesis; see Table 8. At the same time, they confirm the relevance of studying manufacturing relocation in Sweden, as Swedish firms have been active in offshoring as well as backshoring.

In Paper 1, we also found statistically significant differences among drivers and benefits between offshoring and backshoring. In line with previous studies, this study revealed that offshoring is primarily performed in the search for lower labor costs, because this was the only driver that was considered important for offshoring, and statistically significantly *more* important for offshoring than for backshoring. For backshoring, quality, lead time, flexibility, access to skills and knowledge, access to technology, and proximity to R&D were all considered important and were significantly *more* important for backshoring compared to offshoring. In terms of benefits, the positive effects of backshoring seemed to be substantial, as backshorers had experienced significantly stronger benefits related to flexibility, quality, delivery, logistic cost, and other costs than offshorers. The only benefit that was substantial for offshorers was labor cost. When comparing the drivers and benefits for offshoring and backshoring, this study indicated that they are strongly aligned, in both directions. It seems that firms have actually reaped the expected benefits from their relocation projects. The plants that had offshored *and* backshored manufacturing activities during the surveyed period (multi-movers) acted similarly to the plants that had only moved manufacturing in either direction. However, they seemed to have a more balanced view on relocation, in general, as their scores were "less extreme" than those of pure offshorers or backshorers. These findings provide part of the answers to research questions 2 and 3, and are summarized in Table 8.

Paper 1 makes several contributions. First, it provides empirical evidence of offshoring and backshoring activities in the Swedish industry, thus providing industry practitioners and policy makers with important insights into the competitive advantages of Swedish manufacturing. Second, the unique data set with identical questions for offshoring and backshoring allows for statistical comparisons between the two relocation directions, showing that there are significant differences between offshoring and backshoring. Finally, the study showed that there is a strong association between drivers and benefits in each relocation direction, in the sense that the benefits experienced echo the drivers in the same direction.

Table 8 - Results of Paper 1 related to the research questions

Related RQ	Results of Paper 1
RQ1	Swedish firms are active in offshoring and backshoring, although the extent of offshoring is nearly twice the extent of backshoring. Offshoring is primarily done within the own network, while backshoring is done to an equal extent from internal and external parts. Labor-intensive production is offshored, and complex activities are backshored. Regions involved are mainly Europe and China, in both directions.
RQ2	Offshoring is primarily done in a search for lower labor costs, while backshoring is done for several reasons, such as quality, lead time, flexibility, access to skills and knowledge, access to technology, and proximity to R&D.
RQ3	The only benefit related to offshoring is labor cost, while backshoring is associated with flexibility, quality, and delivery, as well as logistics cost and other costs.

Paper 2

Title: Comparing offshoring and backshoring: The role of manufacturing site location factors and their impact on post-relocation performance.

Many factors can potentially influence the manufacturing location decision, but the most commonly used models for explaining international manufacturing seem to agree on three dominant site location factors or strategies: access to low-cost production, proximity to the market, and access to development competences. However, previous studies have treated site location factors in general and not within the specific contexts of offshoring and backshoring.

In Paper 2, the survey data was primarily used for theory-testing purposes, as we investigated the relevance of the three dominant site location factors in the contexts of offshoring and backshoring, through confirmatory factor analyses. Further, we investigated the link between location factors and benefits by performing multiple regression analyses. The second part of the study was essentially exploratory, as there were no previous studies linking drivers of relocation decisions to performance effects.

The results in Paper 2 indicated that the three major site location factors as generally described by literature are also relevant in the specific contexts of offshoring and backshoring, but the two directions are treated statistically significantly differently. For offshorers, the search for low-cost production is an important driver of relocation; it was rated as significantly more important than the other location factors and significantly more important compared to low costs for backshoring. For backshorers, the most important driver of relocation was access to development competences; it was

rated as significantly more important than the other site location factors and significantly more important compared to offshoring. Proximity to the market did not seem to be an important driver in any direction. Finally, we assessed the effects of site location factors on operational performance, measured as cost, quality, delivery, and flexibility, as illustrated in Figure 5. The low-cost factor was strongly and positively related to cost benefits (labor and other costs but not logistics costs) for offshoring and backshoring. However, offshorers seemed to enjoy labor cost benefits to a larger extent, while backshorers primarily enjoy benefits in other costs. The market proximity factor was positively associated with delivery speed, delivery reliability, and logistics cost for offshoring and backshoring. Access to development competences was positively related to quality and flexibility for offshoring and backshoring. However, such access was also associated with logistics costs and delivery speed for backshoring. The results of Paper 2 are summarized in Table 9.

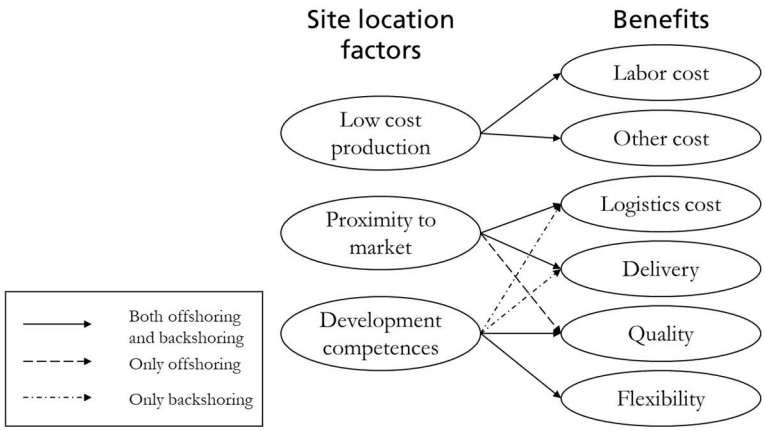

Figure 5 - Associations between site location factors and relocation benefits

Table 9 - Results of Paper 2 related to the research questions

Related RQ	Results of Paper 2
RQ2	The three major site location factors (access to low-cost production, proximity to market, and access to development competences) are relevant for offshoring and backshoring. Offshorers consider access to low-cost production the most important factor, while backshorers consider access to development competences the most important factor.
RQ3	Manufacturing relocation driven by the search for low-cost production leads to cost benefits. The market proximity factor leads to benefits in delivery and logistics cost. The development competences factor leads to benefits related to quality and flexibility; see Figure 5. However, no site location factor leads to benefits in all performance measures. These results are similar for offshoring and backshoring.

Paper 2 makes multiple contributions to the knowledge of manufacturing relocation. First, the paper confirms theory from international business and operations management by supporting the relevance of three major site location factors for manufacturing relocation, not only in general but also in the contexts of offshoring and backshoring. Second, the study showed that site location factors are considered to have differing importance depending on the relocation direction. Finally, the study contributes to the understanding of how specific site location factors influence operational performance and showed that offshoring and backshoring can benefit all performance areas.

Paper 3

Title: Offshoring versus backshoring: Empirically derived bundles of relocation drivers, and their relationship with benefits.

The large set of factors that potentially can influence a relocation decision has typically been grouped theoretically or conceptually. Only a few studies have used empirical data to group drivers, but those studies focused on the offshoring decision and did not include backshoring. Thus, the purpose in Paper 3 was to allow the data lead the categorization of location factors and empirically bundle drivers for offshoring and backshoring. Further, we wanted to investigate the associations between empirically derived groups of drivers and empirically derived groups of benefits.

In Paper 3, the full set of survey data was used for analyses, including Finnish and Danish responses. Exploratory factor analyses were carried out to empirically bundle the drivers of offshoring and backshoring, as well as to bundle benefits experienced at the plant after a relocation project. Finally, multiple regression analyses were used to investigate the relationships between bundles of drivers and bundles of benefits. Thus, the study in Paper 3 was highly exploratory.

The analysis of relocation drivers resulted in five bundles for offshoring and backshoring, with some minor differences; see Figure 6. For offshoring, the bundles were interpreted as cost, market proximity, development, external influence, and trade policy. The bundles for backshoring were similar, but quality emerged as a single item bundle, and external influence and trade policy were bundled together. Thus, quality plays a unique role in backshoring. In addition to quality, development and market proximity were rated as highly important for backshoring. For offshoring, cost was the only factor bundle that was considered important.

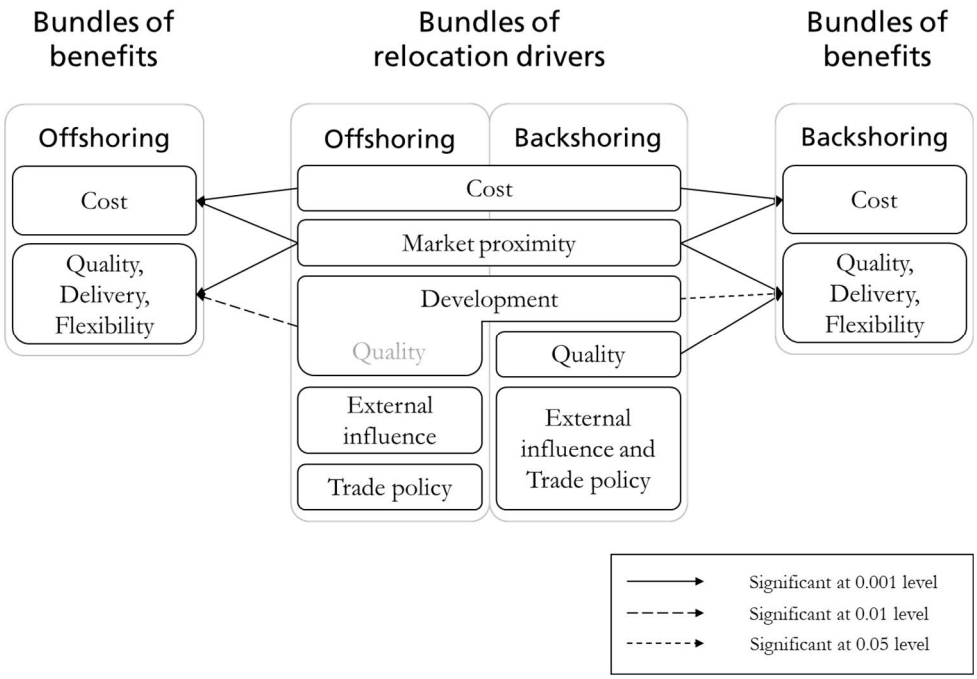

Figure 6 - Bundles of drivers related to bundles of benefits

Benefits experienced after a relocation project were measured by nine items related to cost, quality, delivery, and flexibility. They were bundled identically for offshoring and backshoring and can be summarized as cost and QDF (quality, delivery, and flexibility). The associations between drivers and benefits were investigated with multiple regression analyses, with similar results for offshoring and backshoring; see Figure 6. Cost benefits can be expected if the relocation project is motivated by cost factors and/or market factors. QDF benefits can be expected when the project is motivated by market factors and/or development factors (including quality). Interestingly, market proximity has an important role for performance in both directions. The main results are summarized in Table 10.

Table 10 - Results of Paper 3 related to the research questions

Related RQ	Results of Paper 3
RQ2	For offshoring, relocation drivers are empirically bundled in five groups (cost, development, market proximity, external influence, and trade policy) of which only cost is considered important. For backshoring, drivers are empirically bundled in five similar groups (cost, development, quality, market proximity, and external influence and trade policy), of which quality, development, and market proximity are important.
RQ3	Operational performance benefits are empirically bundled as cost and QDF (quality, delivery and flexibility), for both directions. Cost benefits are achieved when the offshoring or backshoring project is driven by cost and/or market factors. QDF benefits are achieved when the project is driven by development (including quality) and/or market factors.

The main contributions of Paper 3 include; (i) empirically driven bundling of offshoring and backshoring drivers, (ii) empirically driven bundling of relocation benefits, and (iii) empirical evidence for the associations between drivers of manufacturing relocation and benefits experienced after a relocation project. The empirical bundling of factors should be more relevant than theoretical or conceptual bundling, as it is based on how firms actually treat location factors. Further, the study showed that the drivers of a relocation decision are important antecedents for benefits that could be expected after a relocation project.

Paper 4

Title: A case survey of backshoring case studies: The influence of contingency factors on the relocation decision.

Contextual factors influence relocation decision-making in different ways. Interestingly, offshoring has recently been considered a contingency factor for the backshoring decision. The purpose of Paper 4 was to investigate how contingency factors influence offshoring and backshoring decision-making, as well as to investigate how the previous offshoring decision influences the subsequent backshoring decision.

Paper 4 builds on the case survey methodology, thus combining the advantages with in-depth case studies with the strengths of survey research. In total, we analyzed relocation drivers and contingency factors from 36 cases of offshoring and subsequent backshoring activities by first conducting maximum likelihood ratio chi-squared tests

for each pair of contingency factor and relocation driver and then by using a hierarchical cluster analysis to identify how offshoring and backshoring drivers were associated.

The coding of the cases resulted in a list of seven offshoring drivers and 16 backshoring drivers, as well as five contingency factors (i.e., firm size, industry type, main market, home region, and host region). The maximum likelihood ratio chi-squared tests indicated that all contingency factors, except for the main market, statistically significantly influenced the decision-making process for offshoring and backshoring, but to varying extents. The hierarchical cluster analysis of offshoring and backshoring drivers resulted in three clusters. They were interpreted as *Cost*, *Competition,* and *Labor* for offshoring, and *Operational performance*, *Cost,* and *Resource seeking* for backshoring. As we had data for the previous offshoring and *related* subsequent backshoring, we were able to draw conclusions about the causality between drivers; see Figure 7. Thus, we concluded that the offshoring drivers in a specific cluster lead to the backshoring drivers in the same cluster. The results indicated that there were three scenarios: (i) offshoring because of low *Cost* leads to backshoring because of bad *Operational performance*, (ii) offshoring because of *Competition* leads to backshoring because of *Cost* reasons, and (iii) offshoring because of access to *Labor* leads to backshoring because of *Resource-seeking* reasons. The results of Paper 4 are summarized in Table 11.

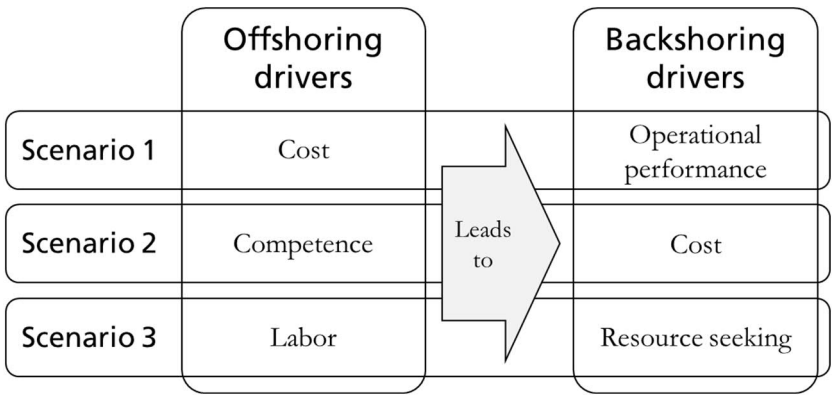

Figure 7 - Three relocation scenarios

Paper 4 makes three main contributions. First, we conducted a case survey, which is a methodology that has never been used in this field. Second, this study showed that contingency factors have important influence over offshoring and backshoring drivers, in the sense that firms in different groups of a specific contextual factor offshore and backshore for different reasons. Finally, the study brings forward the first insights into the causal relationship between offshoring and subsequent backshoring, proving that

the previous offshoring decision is important for understanding why firms decide to pursue backshoring. In essence, we found three scenarios showing that offshoring for specific reasons leads to backshoring for other, distinct, reasons.

Table 11 - Results of Paper 4 related to the research questions

Related RQ	Results of Paper 4
RQ2	Decision-making drivers are to a varying extent influenced by contextual factors, such as firm size, industry type, main market, home region, and host region.
RQ4	Contextual factors are important in relocation decision-making, as firms of different sizes, industries, and regions offshore and backshore for various reasons. Offshoring is an important contingency factor for backshoring, as there are causal relationships between decision-making drivers, distinguished in three clear relocation scenarios.

Paper 5

Title: What do we want to know about reshoring? Towards a comprehensive framework based on a meta-synthesis.

A number of frameworks aiming to describe backshoring have been presented in literature. These frameworks emphasize different aspects of the backshoring process, each adding pieces to the puzzle, but none providing a holistic view. The main purpose in Paper 5 was to develop a comprehensive framework for describing and studying backshoring, including all elements characterizing a full case description, thus extending backshoring theory.

In Paper 5, we first developed a backshoring framework based on frameworks previously presented in literature. Then, we used the meta-synthesis to accumulate knowledge from previous research and refine the framework. In total, we analyzed 14 articles describing offshoring and subsequent backshoring events.

The final backshoring framework that was developed is presented in Figure 8. The backshoring processes follow the offshoring processes, and both include the main elements *Decision-making, Implementation,* and *Outcomes*. *Contingency factors* were placed as an element influencing offshoring and backshoring. Each element in the framework consists of a number of items, specified in Figure 8. Interestingly, the analysis revealed a set of similar items that could shift between being contingencies versus drivers or barriers for the offshoring and backshoring decisions. These were categorized as six different types of influential factors, based on terminology from literature.

The framework includes a graphical illustration of the processes, to describe the chain of events and illustrate the time element, which emerged as an important aspect. Drivers, barriers, and contextual factors were placed in the middle of the graphical representation. The coding process revealed that although no article discussed all elements in the framework, all elements were discussed in at least two articles. In addition, we did not find any information in the articles that could not be categorized according to the framework. Thus, we concluded that it was complete. The most widely discussed items of the framework were contingency factors, time, and backshoring drivers; the least discussed items were preparation, implementation, and outcomes.

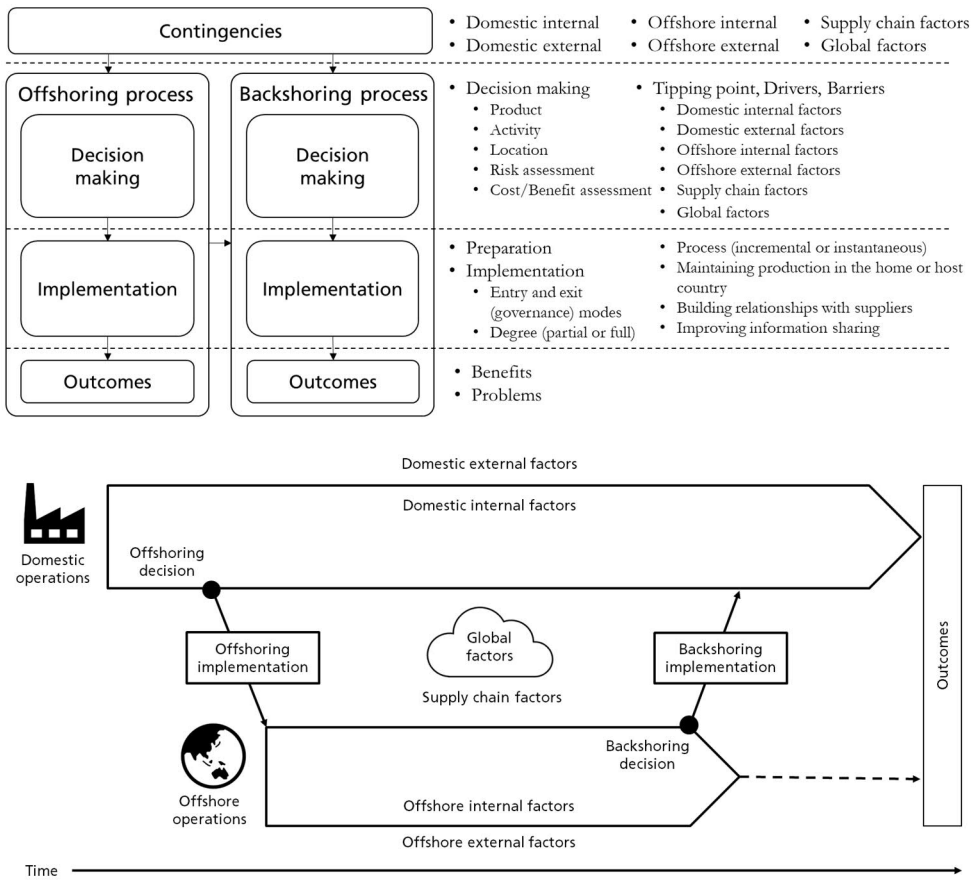

Figure 8 - Comprehensive backshoring framework

The results of Paper 5 are summarized in Table 12. The main contribution of the paper is the backshoring framework, encompassing all relevant aspects for describing and studying backshoring to fully understand the phenomenon. In addition, we used a methodology that has not previously been applied within this field. Further, the analysis of the coding allowed us to map the extent of coverage in previous research for each element, effectively summarizing what we already know about each part of the framework as well as pointing out what parts are less researched. Thus, we could make several suggestions for future research and lead the way for further studies on backshoring.

Table 12 - Results of Paper 5 related to the research questions

Related RQ	Results of Paper 5
RQ2	Backshoring is driven by a wide set of factors, as all factors (domestic internal, domestic external, offshoring internal, offshoring external, supply chain factors, and global factors) had a high percentage of occurrence in the analyzed articles. Backshoring cannot only be explained as a reaction to an offshoring failure, but could reflect a strategy change.
RQ3	Outcomes of the offshoring and backshoring processes have been scarcely discussed in previous research.
RQ4	Contingency factors were widely discussed in all analyzed articles, indicating that they are highly influential in the offshoring and backshoring processes. They change over time and thus, should be reevaluated regularly.

Distribution of work

The papers appended in this thesis are the results from collaborations with other researchers. The first study in this thesis, the survey study, was carried out as part of the ROaMING project funded by VINNOVA, including data collection in Finland and Denmark. From the Swedish perspective, participants included the author of this thesis as well as supervisor Prof. Jan Olhager who acted as the project leader from the Swedish side. The joint research efforts resulted in Papers 1 and 2, based only on the Swedish data set. In addition, we produced Paper 3 as a collaboration with Prof. Jussi Heikkilä from Tampere University in Finland and Prof. Jan Stentoft from University of Southern Denmark in Denmark, based on the full data set from the three countries. The second study, which resulted in Papers 4 and 5, was carried out as part of a collaboration with researchers from University of Bergamo, Italy, namely, doctoral student Albachiara Boffelli and her supervisor, Prof. Matteo Kalchschmidt. Paper 4 was produced with support from Olhager and Kalchschmidt, while Paper 5 is the result of

the joint efforts by Boffelli and myself. Table 13 specifies my contributions to each of the appended papers.

Table 13 - Summary of my contributions to each appended paper

	My contributions
Data collection	
Survey	The survey was developed and pretested before I joined the project, but I played an active part in collecting the Swedish data, as well as cleaning and analyzing the full database.
Case survey	I shared the responsibility of the systematic literature review and case data coding with my co-author Boffelli, with support from Olhager and Kalchschmidt.
Meta-synthesis	I shared the responsibility of the systematic literature review and article coding with my co-author Boffelli.
Paper development	
Paper 1	I shared the responsibility of analyzing the data as well as writing and revising the paper with my co-author.
Paper 2	I shared the responsibility of generating ideas, analyzing data, and writing and revising the paper with my co-author.
Paper 3	I shared the responsibility of generating ideas, analyzing data, and writing and revising the paper with Olhager, with support from Heikkilä and Stentoft.
Paper 4	I led the idea generation and data analysis, and shared the responsibility of writing the paper with Boffelli, with support from Olhager and Kalchschmidt.
Paper 5	I shared the responsibility of generating ideas, analyzing data, and writing and revising the paper with my co-author.

CONTRIBUTIONS AND DISCUSSION

Through the research conducted in this thesis, the phenomenon of backshoring has been explored from several perspectives, contributing to the knowledge within the field in a number of ways. Apart from the contributions related to the research questions discussed below, the thesis also provides theoretical contributions generated by the application of two research methods that have not previously been used for backshoring research. By analyzing the empirical evidence provided by previous case studies, the prevailing knowledge has been accumulated in an effort to bring the research field forward. In general, the studies in Papers 4 and 5 demonstrated the applicability of the case survey and the meta-synthesis and proved how they can be powerful methods for advancing the understanding of the phenomenon, for backshoring research in particular and for the fields of operations management and supply chain management in general. The meta-synthesis conducted in Paper 5 was used to develop a comprehensive framework for describing and studying backshoring, which is an important contribution of this thesis. Previous frameworks included either offshoring or backshoring separately, and did not investigate the relocation alternatives together (Bals et al., 2016; Foerstl et al., 2016; Mihalache and Mihalache, 2016; Benstead et al., 2017). Further, previous frameworks all focused on different aspects of backshoring. Thus, there was an opportunity to incorporate all aspects identified by previous literature into one, comprehensive, backshoring framework. A complete framework with common terminology makes it easier to compare and analyze backshoring studies, and thus, accumulate the knowledge produced in individual studies. In addition to these methodological and theoretical contributions, the thesis makes several contributions related to the four research questions posed in the introduction chapter.

Returning to the research questions

This thesis contributes to the understanding of the phenomenon of backshoring, and particularly the relationship between backshoring and the previous offshoring activity, by answering the following four research questions:

> RQ1: How are Swedish manufacturing plants affected by recent offshoring and backshoring?
>
> RQ2: Why are manufacturing activities offshored and backshored?
>
> RQ3: How is operational performance affected by offshoring and backshoring?
>
> RQ4: How does the context in which the plant operates influence offshoring and backshoring?

In the following sections, each research question is answered with a summary and discussion of the results of the appended papers. The contributions are discussed in light of previous research.

How are Swedish manufacturing plants affected?

This thesis presents the first large-scale survey of offshoring and backshoring in the Swedish industry. Thus, the thesis provides many new insights into the dynamics of manufacturing relocation from and to Sweden. In particular, the thesis shows that Swedish firms have been very active in relocating manufacturing activities, especially compared to other countries where similar studies have been conducted. This concerns not only offshoring. Swedish firms have also repatriated production to a larger extent than firms in other countries (see. e.g. Canham and Hamilton, 2013; Dachs and Kinkel, 2013; Kinkel and Zanker, 2013). The proportion of backshoring relative to offshoring is much higher in Sweden, where there was about one backshoring project for every second offshoring project. This result indicates that Sweden is highly relevant as a manufacturing country, and for studies on manufacturing relocations in particular. However, although Sweden is closer to reaching an equilibrium between offshoring and backshoring than other countries, there is still more production moving away than coming back, and the net effect on the level of manufacturing activity in Sweden is negative. There is a risk that the repatriation of manufacturing jobs in Sweden will continue to be limited, as many types of jobs have been lost due to improvements or

automation of manufacturing (Tillväxtverket, 2020). In addition, the longer the manufacturing activities have been offshore, the greater the risk of deterioration of skills and competences at the domestic site, or and in local and regional workforces (Nujen and Halse, 2017), which would further impede the possibilities to backshore. Examining the drivers that are considered important for the relocation decision, as well as the benefits experienced after a relocation project, it is clear that Swedish firms more or less consider only cost aspects when offshoring manufacturing, and then specifically labor cost. Consequently, the activities that are offshored are categorized as labor intensive. This is in line with the general perception that labor costs in Sweden are high compared to other countries, and although the labor cost gap between countries is decreasing, it is not shrinking sufficiently fast for Swedish manufacturing to be cost competitive in the near term (Alsén et al., 2013). Interestingly, other aspects that have been of interest for policy makers, such as trade barriers, taxes, or exchange rates, are in general considered unimportant for the offshoring decision. When simpler, labor-intensive jobs have been offshored, the types of jobs that remain in Sweden are generally extremely knowledge intensive (Tillväxtverket, 2020). For backshoring, this study identified a wider set of drivers as important (including quality, delivery, flexibility, access to technology, skills and knowledge, and proximity to R&D), and activities that are repatriated are considered complex. Thus, the results indicate that Sweden offers competitive advantages for complex production activities that require innovation capability, advanced technology, and skills and knowledge. In Sweden, production is increasingly being digitalized and automatized. This leads to a need for other types of competences in the workforce (Tillväxtverket, 2018), and the share of jobs that demand higher education is increasing (Tillväxtverket, 2020). Therefore, there is increasing demand for education, through universities but also on-the-job training. A study of Swedish firms showed that as many as half of the respondents found access to skilled workers a considerable problem and hindrance for the firm's development and growth (Tillväxtverket, 2018). Availability of a skilled workforce is of central importance for the attractiveness of a geographic region and should be a high priority on the agenda of policy makers. Thus, innovation capability and skills and knowledge are strengths that industry practitioners and policy makers should focus on developing. Interestingly, Swedish firms primarily interact with other European firms, as a considerable portion of recent offshoring has been to Eastern Europe (but also Western Europe and other Nordic countries). Eastern Europe has been pointed out in previous literature as an example of a near-shoring destination providing cheap labor compared to the home country but closer to the market, and thus, offering shorter lead times and lower logistics costs (Kinkel et al., 2007). The increased technology density of manufacturing processes makes production more specialized, and customers are increasingly asking for customized products (Tillväxtverket, 2020). Individually adapted products put pressure

on high production flexibility, which is not compatible with long lead times from long-distance suppliers. Consequently, proximity to suppliers and customers is increasingly important. Two-thirds of the Swedish plants in the survey study have their main market in Europe. From a supply chain perspective, it is thus wise to look for sourcing options in the same region.

In summary, through Paper 1, this thesis has provided industry practitioners and policy makers with important insights into the competitive advantages of Swedish manufacturing. Paper 1 also proved the relevance for studying Sweden in the context of offshoring and backshoring. Swedish firms have been very active in relocating manufacturing and thus, generated a considerable amount of data, enabling statistical comparisons of the two relocation directions.

Why are manufacturing activities relocated?

The drivers of manufacturing relocations have been investigated through different perspectives in the appended papers. In Paper 1, we studied the individual factors of offshoring and backshoring, investigating their perceived importance for the relocation decision and statistically comparing the drivers for offshoring and backshoring. In summary, offshoring was primarily done in the search for lower labor costs, while backshoring was done because of quality, lead time, flexibility, access to skills and knowledge, access to technology, and proximity to R&D. This result aligns well with previous survey studies on offshoring and backshoring (Kinkel and Maloca, 2009; Kinkel, 2012; Canham and Hamilton, 2013; Kinkel and Zanker, 2013; Stentoft et al., 2015). In addition, the results further confirm the notion that offshoring is a cost-reducing strategy (Mihalache and Mihalache, 2016), while backshoring is chosen because of a wider set of reasons. In light of the Swedish perspective, this suggests that the relocation decision is contingent on the geographic context and the prevailing conditions in the regions involved (e.g., developed, high-cost versus undeveloped, low-cost regions). Interestingly, Paper 1 provided new insights into the reasons for manufacturing relocation of plants that have moved manufacturing in only one direction compared to plants that have off- and backshored. The bi-directional movers act as offshorers for offshoring and backshorers for backshoring, and it is clear that there are different rationales for moving manufacturing in the different directions. However, bi-directional movers typically take a middle position when they rate the relative importance of different drivers. This could be interpreted as them having a more balanced view of the drivers of manufacturing relocation. It also indicates a learning effect in firms that are actively relocating manufacturing, in the sense that they are fine-tuning and balancing their manufacturing network based on gained experience, by

practicing offshoring and backshoring. These results are novel compared to previous studies.

In Papers 2 and 3, we investigated different ways of grouping drivers of manufacturing relocation, to be able to understand the dimensions of the issues at hand more conveniently and to complement the many conceptually derived categorizations from previous literature. In Paper 2, we analyzed relocation drivers in light of the major manufacturing location theories from international business and operations management (Bartlett and Ghoshal, 1987; 1989; Ferdows, 1989; 1997; Dunning, 1998). The results provided support for three dominant site location factors: (i) access to low-cost production, (ii) proximity to the market, and (iii) access to development competences. These factors are relevant as drivers of the manufacturing location decision, in general and for the particular contexts of offshoring and backshoring. Nevertheless, we also wanted to group relocation drivers using empirical data, to test how firms actually treat location factors and provide practically relevant bundling of drivers. We showed this grouping in Paper 3, and the results were five groups of drivers for offshoring and backshoring, respectively. However, the groups differed slightly between the relocation directions. For offshoring, the groups were cost, market proximity, development, external influence and trade policy. For backshoring, the two factors external influence and trade policy were grouped together, whereas quality emerged as a single-factor group, thus further proving its unique role in repatriation of manufacturing. Interestingly, the groups of relocation drivers in Paper 2 and Paper 3 do not contradict each other. On the contrary, they are quite similar, with the major difference that the empirical bundling of drivers resulted in two additional groups. The group external influence includes new items compared to the theoretical site location factors, that is, items that we had data about from the survey, but we could not categorize in any of the theoretical site location factor groups. The empirical group trade policy includes two items from the theoretical group market proximity (trade barriers and country-specific conditions), which indicates that firms are separating issues related to trade from issues related to market proximity in their decision-making. However, neither of these two additional groups of drivers (external influence and trade policy) was considered important for the relocation decision, suggesting that the three site location factors from theory are relevant. Quality did not fit any of the theoretical site location factors. It emerged as one single-factor group for backshoring, emphasizing the important role of quality in backshoring. Figure 9 illustrates the comparison between the bundles of relocation drivers from Paper 2 and Paper 3.

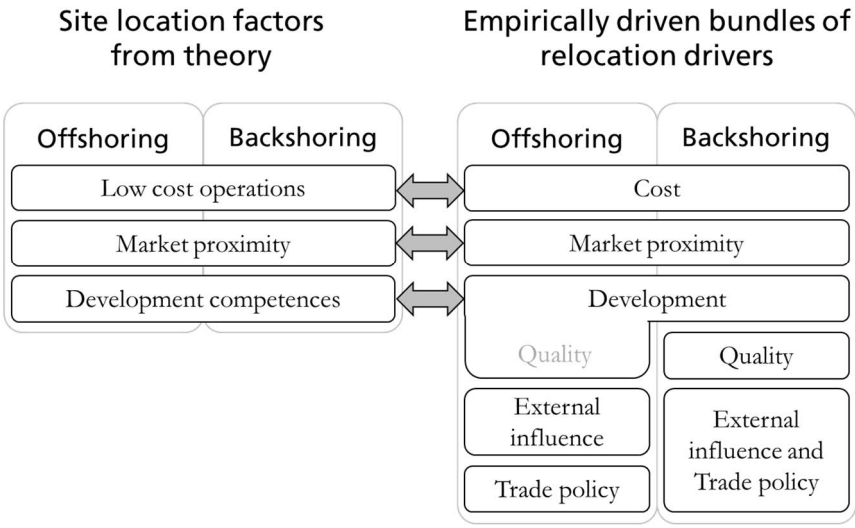

Figure 9 - Comparing theoretical and empirical bundling of relocation drivers

The study in Paper 3 provides the first effort to bundle backshoring drivers using empirical data. This had been done previously only for offshoring (Roza et al., 2011; Ellram et al., 2013; Linares-Navarro et al., 2014; Tate et al., 2014), with varying results although all previous categorizations included a group related to cost. The empirical bundling in Paper 3 is an important contribution of this thesis, as it shows how firms are actually handling relocation drivers, and thus, should be more relevant for relocation studies than conceptually derived bundles. In addition, it does not contradict but instead, complements the groups of drivers from the major manufacturing location theories, put forward by Ferdows (1989; 1997), Dunning (1998), and Bartlett and Ghoshal (1987; 1989).

The theoretical lenses usually used for explaining the manufacturing location choice, TCE and the RBV, are, to some extent, applicable for explaining offshoring and backshoring, although they are focused on the ownership aspect than the location aspect. As offshoring is based only on labor cost considerations, it could be explained by TCE, suggesting that offshoring firms aim at minimizing the cost of expediting a particular product (be it in their own factory or in the factory of a partner). Backshoring, however, is done for several reasons other than cost, related to competence and innovation. The RBV is a suitable theoretical lens, suggesting that backshoring firms are searching for competitive advantage based on resources that are valuable, rare, inimitable, and non-substitutable. However, as pointed out in Papers 2 and 3, there is a strong alignment between cost drivers and cost benefits for offshoring and

backshoring, which indicates that both offshoring and backshoring may follow the fundamentals of TCE. In the same way, the drivers related to development competences are related to QDF benefits, not only for backshoring but also for offshoring. These results indicate that offshoring projects, too, could aim for attracting important resources to gain a competitive advantage. In essence, TCE and the RBV are complementary theories that, to some extent, explain offshoring and backshoring, although neither one alone can fully explain relocations in both directions. The eclectic paradigm of Dunning (2015) provides a more complete model of explanation, which can be used for offshoring and backshoring. Although the eclectic paradigm focuses on foreign direct investments, it assumes that the optimal configuration of the manufacturing network changes over time, which would also explain repatriation of manufacturing activities when the decision factors change in favor of the domestic location. The backshoring literature usually focuses on the location advantages of the eclectic paradigm, but the results of the survey study indicate that backshoring is also done to gain access to competences and innovation capability, usually considered ownership advantages of a firm. When the factor bundles in Papers 2 and 3 are compared to the location advantages of Dunning's eclectic paradigm, there are some differences in how relocation drivers are grouped. In Paper 2, two of Dunning's four location advantages were joined under the low-cost factor (i.e., resource- and efficiency-seeking advantages), as the items included in those two groups matched the items of the low-cost factors presented by Ferdows (1989; 1997) and Bartlett and Ghoshal (1987; 1989). The empirical factor bundling performed in Paper 3 further verified this categorization, as it corresponds well to three out of four location advantages of Dunning's OLI framework. We found support for efficiency-, market-, and strategic asset–seeking advantages, for offshoring and backshoring. However, resource-seeking advantages did not gain much support, in line with the observations from Ellram et al. (2013), indicating that firms are moving away from resource-seeking considerations in favor of other aspects.

In terms of the importance of the factor groups (thus, identifying the main drivers of offshoring and backshoring), Papers 2 and 3 further confirm the findings from Paper 1. The factor group related to cost was the only one considered important for offshoring, while quality was exceptionally important for backshoring, but also development competences. These findings add additional insights to the discussion whether backshoring is chosen as a consequence of failed offshoring (indicating a managerial mistake) or as a consequence of a shift in strategy (see e.g. Fratocchi et al., 2016). It could be argued that offshoring was chosen based on limited analyses, mainly focusing on the labor costs while neglecting to estimate additional costs and evaluating risks and performance challenges generated by operating in a very distant location (in

line with the reasoning by Gray et al., 2017). However, there are studies clearly stating that offshoring was not a failure but was done as a consequence of changing conditions during the period of the offshoring operations, leading to a strategy shift (Martínez-Mora and Merino, 2014; Di Mauro et al., 2018). Based on the survey results, it seems as if the first view is more supported. Labor cost was considered the most important, and the only important, driver for the offshoring decision. Backshoring was primarily chosen for quality reasons, suggesting that the offshore site was not able to live up to the quality expectations, similar to the findings of Joubioux and Vanpoucke (2016). In addition, lead time, flexibility, and logistics cost were rated as important for backshoring, indicating a deterioration in these aspects during the offshore operations. Taken together, the survey results related to relocation drivers presumably indicate a limited analysis of the benefits and challenges of operating offshore, mainly focusing on the labor cost, and that backshoring was chosen to avoid the problems and additional costs faced at the offshore site. It seems as if firms, in general, still see labor as merely a cost item instead of considering it an important asset and source of competitive advantage. However, offshoring could result in a loss of competences and innovation ability at the home plant (Nujen and Halse, 2017). The survey results showed that access to technology, access to skills and knowledge, and proximity to R&D were rated as important drivers for backshoring but had low importance for offshoring. This finding supports Nujen and Halse (2017) observations indicating that offshoring decisions tend to disregard in-house knowledge aspects, and that backshoring is chosen to regain access to, or rebuild, internal competences and innovation ability. Although there are cases with a "different story" than the one described here, they are not enough to influence the results of the survey data and thus, could be considered exceptions.

In Paper 4, the main purpose related to the second research question was to investigate the relationship between offshoring and backshoring drivers, because previous researchers had pointed out that there is a strong path dependency between the two relocation directions, and they should be investigated together (Kinkel and Maloca, 2009; Gray et al., 2013; Barbieri et al., 2018). Cases were purposefully selected to report data on backshoring and the preceding offshoring, to allow us to identify whether specific drivers of offshoring lead to specific reasons for backshoring. To the best of our knowledge, this was the first study to draw conclusions about the causality between the drivers of the two events, thus making a considerable contribution to the research field. Three different relocation scenarios were identified through the study (see Figure 7). First, firms that offshore because of cost reasons (excluding labor costs) mainly repatriate because of motivations connected to operational performance, including poor quality and long lead times. As suggested in previous literature, this

could reflect either a strategy shift from cost leadership to differentiation or a managerial mistake related to miscalculations during the offshoring decision-making process and unforeseen problems in the operations management area (Kinkel, 2014; Fratocchi et al., 2016; Di Mauro et al., 2018). Second, firms that offshore for reasons related to competition usually backshore because of cost (e.g., costs related to logistics or supply chain issues) or lead time. One possible explanation for this relationship is that the initial offshoring decision likely was made quickly and not completely rationally (Gylling et al., 2015; Gray et al., 2017), motivated by willingness to seize an opportunity. The most likely outcome based on these premises is the revision of the decision as soon as more accurate information is available. Finally, firms that offshore because of labor-related reasons (such as cheaper labor cost and favorable country legislation) mainly backshore for reasons typically referred to as resource seeking. This indicates that firms that were originally attracted by the availability of low-cost labor in the offshore region sooner or later faced problems related to competence shortage, lack of innovation capability and technology, or lack of valuable, non-replaceable resources (Di Mauro et al., 2018; Nujen et al., 2019), thus initiating the backshoring project. These findings provide an important contribution and valuable insights for practitioners aiming to right-shore.

The meta-analyses of existing case studies, performed in Papers 4 and 5, further confirmed the survey results in terms of drivers that are considered important for offshoring and backshoring. However, the qualitative meta-synthesis in Paper 5 provided some deeper insights into the decision-making process and a more nuanced picture of the motivations for relocation. Specifically, some case studies strongly emphasized emotional factors and a sense of belonging in the domestic region as the reasons for backshoring (Benstead et al., 2017; Di Mauro et al., 2018), thus indicating that decision-making is not always based on objective information. This view is further strengthened by (Gray et al., 2017), who concluded that decisions usually are based on experience and biases rather than on rational evaluations of complete sets of information. Additionally, through the meta-synthesis a "tipping point" in the relocation decision-making process was identified. This means that firms usually have more than one reason to repatriate manufacturing, but each reason alone is not important enough to drive the decision. Instead, issues pile up until the firm reaches a tipping point, where one additional driver (usually related to cost) makes the situation unsustainable and thus, leads to the backshoring decision (Benstead et al., 2017). The optimal location for specific manufacturing activities is determined by an interplay between several factors, which change over time. The longer the offshoring period, the less likely the factors have remained stable over time (Nujen and Halse, 2017; Baraldi

et al., 2018). Thus, drivers of the relocation decision are dynamic and should be reevaluated regularly, as pointed out by, for example, Ellram et al. (2013).

How is operational performance affected?

One of the main contributions in this thesis is the empirical evidence provided regarding the performance effects of offshoring and backshoring. Although the performance effects of offshoring have been examined to some extent in previous literature, without providing any consistent evidence of its benefits (Mihalache and Mihalache, 2016), backshoring outcomes have been only limitedly reported (Stentoft et al., 2015; Robinson and Hsieh, 2016). This view was further confirmed by the findings in Paper 5, because offshoring performance was mainly mentioned as a motivation for backshoring, while backshoring performance was rarely mentioned at all. Thus, the findings presented in this thesis provide important insights into the benefits experienced after a relocation project in each direction. The inconsistent results from previous studies related to offshoring performance could be explained by the choice of unit of analysis. Most often, the unit of analysis in previous studies was the firm. However, performance effects related to a specific relocation project may be insignificant in the context of the firm performance. In this study, we focused on the plant level, where the performance effects are actually experienced, capturing the benefits of a specific relocation project. Thus, we were able to analyze and compare the performance effects of offshoring and backshoring in detail. First, we showed that the only individual benefit that was significantly related to offshoring was labor cost, while backshoring leads to benefits in several aspects, including flexibility, quality, delivery, logistics cost, and other costs, in line with previous studies (Stentoft et al., 2015). Second, in Papers 2 and 3 we showed the associations between pre-relocation drivers and post-relocation benefits, answering the calls from Roza et al. (2011) and Mykhaylenko et al. (2015). This is an absolute novelty presented in this thesis, as no previous studies have shown the associations between backshoring drivers and benefits. In general, the findings from the survey study indicate that all traditional performance measures, that is, cost, quality, delivery, and flexibility, can be improved by a manufacturing relocation project, in both directions. Another contribution of this thesis is the empirical bundling of relocation benefits, performed in Paper 3. Bundles of offshoring benefits and backshoring benefits were identical, with cost items grouped together in a cost construct, and quality, delivery, and flexibility grouped in one construct referred to as QDF. This means that studies on the performance effects of offshoring and backshoring could be rationalized to these two dimensions.

The drivers of a relocation project could be argued to reflect what is expected from a relocation project in terms of performance improvements. This study shows that there is a strong alignment between the drivers of the offshoring and backshoring decisions and their outcomes in the sense that the benefits experienced after a relocation project echo the factors that were perceived as important decision-making drivers. In essence, relocation because of low cost leads to cost benefits, relocation because of development competences leads to benefits in quality and flexibility, and relocation because of market access leads to benefits in delivery and logistics costs. These findings are valid for both offshoring and backshoring, which means that firms seem to be reaping the expected benefits from a relocation project. Thus, the motivations for manufacturing relocation, as part of the relocation strategy, are important antecedents for explaining the relocation outcomes, in line with the suggestion from Mykhaylenko et al. (2015). This means that decision makers need to develop relocation strategies that are in line with the firm's competitive strategy and with what they aim to achieve, making clear distinctions between which activities should be offshored and which should be kept at home. This would increase the performance effects and success rates of the relocation projects (if by success, they mean they achieve their own set targets). However, if the firm desires performance improvements on a broader scale, there is a need to balance the relocation motivations, as no driver alone leads to benefits in all performance measures. Importantly, proximity to the market should always be considered in the relocation decision as this motivation has a strong influence on cost performance as well as QDF performance, for offshoring and backshoring. Firms with production facilities situated far from their markets are exposed to higher risks of logistics problems and supply chain interruptions. Serving the market from within reduces logistics costs and minimizes risks related to exchange rate fluctuations and other political factors, and thus, should be the best way to operate in an international market, as argued by MacCormack et al. (1994).

The findings of Paper 4 indirectly provide some interesting findings related to the performance effects of manufacturing relocation, and specifically to the effects of offshoring. The cases included in the study provided information about offshoring projects that were fully or partially repatriated. Some of the backshoring cases were based on strategic decisions, but the majority of cases described offshoring projects that did not live up to expectations and that led the firm to repatriate. Thus, the three relocation scenarios identified provide some hints in terms of offshoring pitfalls that may be avoided through more careful planning and evaluation. As discussed above, offshoring based only on cost considerations may reflect a limited analysis and lead to unforeseen problems at the offshore site. This could be avoided with a complete evaluation of benefits and risks that takes into account the unexpected costs that could

occur, thus generating a more viable offshoring decision. In the same way, offshoring because of competitive reasons could indicate a quick decision based on limited analysis, a decision that could have been optimized with more accurate and complete information and analysis. Finally, better preparation in terms of evaluation and development of technology, skills, and knowledge at the offshore site could mitigate the risk of ending up with a lack of competence and innovation capability, when offshoring is done because of labor costs. In summary, by learning from the three relocation scenarios, some of the offshoring hurdles could be avoided, thus increasing the offshoring performance. However, the case selection in Paper 4 only included offshoring projects that later led to backshoring, which means that to evaluate the success factors of offshoring, studying offshoring projects that "stayed offshore" is more appropriate.

How does the context influence manufacturing relocations?

At the beginning of this thesis work, there were very few studies on the role of contextual factors in the offshoring and backshoring processes (Bals et al., 2016; Benstead et al., 2017; Moore et al., 2018). Thus, the thesis contributes with important insights into the role of contingency factors in the decision-making process. First, the findings of Paper 5 indicate that contingency factors are highly influential in the offshoring and backshoring processes, as the factors were widely discussed in all analyzed articles. The results showed that manufacturing relocation occurs in various industries and is not limited to certain firm sizes. However, in Paper 4 we showed that firms with different characteristics in terms of size, industry type, main market, and home and host regions, relocated manufacturing because of different reasons. Thus, the findings of Paper 4 contribute to operations management and supply chain management research by identifying relevant contingency factors for relocation decisions, called for by Sousa and Voss (2008). For example, firms in low-tech industries followed their competitors offshore to a large extent, while high-tech firms offshored because of favorable legislation and/or taxation in the host country. Offshoring to Eastern Europe was mainly conducted because of the low labor costs offered by the region. In addition, low-tech firms backshored manufacturing because of supply chain and cost reasons, and firms with their main market in Europe repatriated (from very distant locations) because of lead-time issues. The results clearly showed that contingency factors are relevant when discussing differences among offshoring and backshoring drivers and illustrates the complexity of manufacturing location decisions, in line with findings from Lampón and González-Benito (2019) and Wan et al. (2019b). Additionally, in Paper 4 we showed that there is a causal relationship between offshoring and backshoring drivers, as discussed above. This

finding indicates that the offshoring decision is an important antecedent of the subsequent backshoring decision, and thus, further strengthens the importance of examining offshoring and backshoring together to understand why firms decide to bring back manufacturing activities. In summary, the findings of Paper 4 indicate that firms are elaborating with their global supply chains to find the optimal location for their specific needs, finding a fit between their characteristics and the advantages offered by the host (or home) region, in line with the findings of Jensen and Pedersen (2011).

Collectively, the findings in this thesis suggest that contingency theory provides an important theoretical lens for explaining differences in relocation drivers when it comes to offshoring and backshoring. The results indicate that firms are flexible and reactive to changes in the global manufacturing environment, using offshoring and backshoring to match their structures to the prevailing conditions and thus, optimize their global footprints. Donaldson (2001) argued that the level of fit is evaluated by studying the firm performance; high performance indicates a good fit, while a misfit would lead to low performance. Overall, it seems that the firms in this study have managed to achieve a good fit between drivers, activities, and local contexts (as pointed out by Jensen and Pedersen, 2011), and thus, achieved high performance in the desired performance areas. As indicated by the survey study, firms offshore labor-intensive activities from high-cost regions to low-cost regions because of cost reasons, and thus, achieve superior cost performance. However, there are regional differences in terms of how Swedish plants rate relocation drivers. Offshoring to Asian countries (including China and India), as well as Eastern Europe, is done because of labor costs. However, offshoring to other Nordic and Western European countries is primarily done because of the focus on core competences and flexibility. In contrast, backshored activities are considered complex, brought back because of quality and delivery aspects, as well as access to skills and competences. This has led to considerable benefits in terms of QDF performance. Again, there are regional differences in drivers. When backshoring is done from Asian countries, lead time and flexibility are more important than quality, suggesting that the distance between the production and the market is a bigger issue than quality. Interestingly, quality is important for backshoring from all regions, including from Nordic and Western European countries. This indicates that quality is not so as dependent on different regions but is a matter of comparing the own plant's quality performance with other plants' performance. It seems that the respondents of the survey study want to maintain control over quality by performing the manufacturing activities at their own plant. The ownership mode, which is intricately related to offshoring and backshoring decisions, did not have any statistically significant influence on the drivers or benefits of the survey data. Thus, the geographic aspect, and the relative benefits of

different regions, is more important for relocation decision-making and performance effects than the ownership aspect.

This study has contributed by identifying some of the contingency factors that influence firms' location decision drivers, such as industry, firm size, home and host regions, and market. However, there could still be other important contingency factors that were not included in this study. For example, in addition to country- and company-related contingencies such as the ones examined, Benstead et al. (2017) suggested that product-related contingencies, such as price point, customization, and market segments, could influence the importance given to different backshoring drivers, and Bals et al. (2016) added contingencies related to the decision magnitude and characteristics of the relocated activities. Further, technology as a contingency factor was suggested already by Donaldson (2001), and is still very relevant as the pace of technological development is accelerating, and firms are increasingly adopting technologies related to Industry 4.0. This could be a game changer in the offshoring versus backshoring discussion, as it influences the relative advantages of different regions, for example, by offsetting the labor cost advantages in a low-cost region by increasing productivity in the domestic region.

IMPLICATIONS AND FUTURE RESEARCH

This chapter presents the implications generated by the findings and contributions of the thesis, for academics and for practitioners involved in manufacturing relocation projects. Finally, the main limitations of the studies are discussed, leading to suggestions for future research avenues.

Implications for research

This thesis provides a number of implications for researchers. First, the use of identical survey questions for offshoring and backshoring allowed for statistical comparisons between the two relocation directions. The results from Papers 1–3 clearly indicated that offshoring and backshoring are two very different decisions, especially in terms of the motivations for the relocation decision. In Paper 3, the empirical bundling of relocation drivers even resulted in two different sets of drivers for offshoring and backshoring. These empirically derived bundles should be more relevant for future studies on relocation drivers compared to the conceptually derived bundles identified in literature. Further, the perceived relative importance of drivers was substantially different between the relocation directions, even at plants that have experience offshoring and backshoring. However, although the decisions are based on different drivers, it is important to investigate offshoring and backshoring together to get a full understanding of the backshoring phenomenon. This was essentially pointed out in Paper 4, where the results showed a dependency between offshoring and backshoring drivers.

Second, this thesis provides empirical bundling of performance effects, resulting in two identical bundles for offshoring and backshoring, one related to cost factors and one to QDF. Thus, studies on the performance effects of offshoring and backshoring could be rationalized to these two dimensions. In addition, benefits experienced after a relocation project were compared for offshoring and backshoring, indicating that there are significant differences between the performance effects of the two directions. In general, offshoring is related to improved cost performance (labor costs specifically), while backshoring is related to enhanced QDF performance.

Third, this thesis shows that contingency factors are important to consider in studies on offshoring and backshoring, particularly from a decision-making perspective. When it comes to relocation decision-making, firms from different contexts attach differing importance to the drivers of offshoring and backshoring. This was indicated in the case survey and the survey study. For example, the survey study was conducted within the Nordic industry, thus providing the perspective of plants in a high-cost region relocating production to and from low-cost regions. From a contingency perspective, the relative importance of drivers (low cost for offshoring and quality, delivery, and flexibility for backshoring) suggests that the geographic context is important for relocation decisions. Offshoring has been focused on low-cost regions, while Sweden is considered a high-cost region with other attractive attributes, such as a skilled workforce and technically advanced manufacturing. Studies on relocations conducted from and to other regions, for example, from and to a low-cost region, could generate other results. In addition to the contingencies traditionally studied, this thesis proved that the previous offshoring decision could be considered a contingency to the subsequent backshoring decision, because there is a causal relationship between offshoring and backshoring decision drivers. This further confirms that manufacturing relocations are complex, with many perspectives that must be considered to optimize the outcomes. Thus, researchers should focus on finding the combinations of firm characteristics, type of activities, and competitive advantages offered by different regions that generate the highest performance effects. Contingency theory is a suitable theoretical lens to apply to these types of studies.

Fourth, in terms of theoretical implications, the findings presented in this thesis proved that the three site location factors traditionally included in models explaining international manufacturing, (i.e., (i) access to low-cost production, (ii) proximity to the market, and (iii) access to development competences), are applicable in offshoring and backshoring. Additionally, a comprehensive framework for research on backshoring was developed, including all elements relevant for a complete description of the phenomenon. Use of the framework not only enhances the understanding of backshoring but also facilitates comparison between studies. As a result of the application of the framework to the available case studies within the field, many under-researched areas were identified, thus generating a list of suggestions for future research related to the elements of the framework. For example, one of the least studied elements of the backshoring framework is implementation (for both offshoring and backshoring). Aspects such as the degree of relocation (full or partial), the process (incremental or instantaneous implementation), and the organization around relocated activities (structure and coordination) should be important for the relocation outcomes and require further research.

Finally, in terms of methodological implications, the applications of the case survey and the meta-synthesis proved that the methodologies are powerful for accumulating existing knowledge and for advancing knowledge within the research field. This is true for studies of the phenomenon of backshoring, but should also be true for other studies within the multidisciplinary fields of operations management and supply chain management.

Implications for practice

For managers, this thesis generated a number of important insights related to offshoring and backshoring of manufacturing activities. Essentially, the studies in the appended papers provide indications of what drives operational performance in a relocation project, thus giving practical insights into how to successfully manage offshoring or backshoring. First, the results of the survey study indicated that the drivers of a relocation decision are important antecedents for explaining benefits that could be expected after a relocation project, as there was a strong alignment between drivers and benefits for offshoring and backshoring. In essence, offshoring was implemented in the search for low labor costs and resulted in cost benefits, while backshoring was implemented because of many reasons, including quality, delivery, flexibility, proximity to R&D, and access to skills, knowledge, and technology, resulting in benefits related to QDF. There was also an alignment between relocation drivers and the characteristics of the production activities that were relocated, in the sense that labor-intensive production was offshored (related well to the cost focus), while complex production was repatriated (related well to the focus on quality, delivery, and flexibility). This indicates that to realize the expected benefits there must also be an alignment between the type of production and drivers. The strong associations between drivers and benefits have additional implications for offshoring and backshoring performance. Importantly, there is a need to widen the focus in the decision-making process to include a more extensive set of relocation drivers to achieve widespread performance effects. Firms should avoid considering offshoring as merely a cost-reducing strategy and backshoring as a way of improving quality, delivery, and flexibility. Otherwise, the performance improvements will be limited to certain performance areas. Interestingly, the studies showed that drivers related to market proximity generated considerable performance effects for offshoring and backshoring, which means that market factors should always be considered in the relocation decision-making process.

Second, this thesis has provided valuable insights related to the relationship between offshoring and backshoring drivers, in the sense that there is a causality between them.

Three relocation scenarios were identified, making it possible to anticipate the reason for backshoring if offshoring is based on certain decision drivers. In particular, these findings are valuable because they highlight possible pitfalls of offshoring. Offshoring firms should consider these pitfalls during the decision-making process to increase the chances of finding the optimal manufacturing location and not having to bring back activities because of an unsuccessful offshoring project.

Finally, the backshoring framework presented in Paper 5 and the findings related to each element of the framework provide a broader picture of the backshoring process, as well as valuable insights into the dynamic nature of international manufacturing. Together with the findings from the Swedish industry, the framework can be used for benchmarking by managers who are considering or planning a relocation project. Collectively, the findings presented in this thesis have considerable implications for managers. The findings indicate that managers need to develop relocation strategies that are in line with the firm's competitive strategy and with what they aim to achieve, making clear distinctions between which activities should be offshored and which should be kept at home. This would increase the performance effects and success rates of the relocation projects.

Limitations and avenues for future research

There are some limitations at the studies in this thesis, which lead to several avenues for future research. The greatest limitation of the survey study is the geographic setting, as it was limited to a well-developed, high-cost region. The results are relevant for highly industrialized countries, showing that it is possible to attract manufacturing to a high-cost country and remain competitive. However, this context limits the possibility to generalize the results to regions with other characteristics. Manufacturing relocation from developing, low-cost regions is most certainly pursued because of a different set of drivers than those identified in this study. Similarly, although the meta-analyses in Papers 4 and 5 included all published case studies describing offshoring and backshoring, these analyses have the same limitation. The case studies published were conducted in the context of high-cost to low-cost countries, with an emphasis on studies from the Nordic region. Thus, to gain a more nuanced view on manufacturing relocations in general, it would be very relevant to perform survey studies and case studies with the perspective from a low-cost region. For example, it would be interesting to investigate the importance of relocation drivers and compare them to the findings from high-cost regions.

Additionally, this thesis opens up avenues for more survey research. First, confirmatory survey studies could be performed to test the theoretical contributions put forward in this thesis. In Paper 3, we presented empirically based bundles of relocation drivers and benefits. Through a survey, their robustness could be tested, for example, by replicating the study in a different geographic context to see if the bundles turn out similarly or by testing the robustness over time with a longitudinal survey. This would allow to investigate whether the bundles are influenced by, for example, policy-making, technological advancements, or sustainability concerns. Moreover, in Paper 4 we identified three different "relocation scenarios," based on the associations between offshoring and backshoring drivers. They were identified through previous case studies, and their robustness should be confirmed with survey research to generalize their applicability.

Second, longitudinal surveys could be performed to investigate the influence of time on manufacturing relocation, as time was identified as an important factor in the study in Paper 5. It would be highly interesting to capture changes and the relative progression of offshoring and backshoring activities in different regions, especially in relation to changes in contingency factors, such as firm characteristics, home and host country characteristics, and global trends such as the Industry 4.0 revolution, environmental and social concerns, or macro-economic trends in general. Further, longitudinal surveys could be used to further investigate the performance outcomes of manufacturing relocation, for example, to see whether there is a time lag between implementation and performance effects or whether manufacturing relocation may generate other types of benefits than the ones included in this study.

A general limitation with survey research is the lack of depth compared with case research. To overcome this limitation, two meta-analyses based on previous case studies were performed. However, this methodology has several limitations: (i) The sample size may be limited by the number of available case studies relevant for the research questions of interest, (ii) the methodology relies on secondary data, which may be restricted because of space limitations in the articles, and (iii) the meta-analysis inherits the limitations of the original studies (Larsson, 1993). These limitations were considered during the research design by, for example, including articles from a wide array of journals without limiting the study to top journals to increase the sample size. In addition, we focused on peer-reviewed journals to ensure high-quality studies were included for further analyses. Future research could address the sample size issue and thus, gain the possibility to conduct more advanced statistical analyses of the data. Another possible avenue for future research would be to involve the original authors in the study, to confirm the findings but also to ask for additional information that was not published in the articles.

Finally, case studies could be performed to gain more in-depth understanding of the phenomenon of backshoring. One possible avenue for future research is to test the application of the backshoring framework proposed in Paper 5. The framework can be used as a guide for collecting complete information to achieve a full understanding of the complex issues at hand. Moreover, case studies could be used to further investigate the role of contingency factors in relocation decision-making, as there could be other important factors that were not included in this thesis. Case studies can capture the situation-specific contingencies and thus, help researchers identify the combinations of factors that generate the best fit for improved operational performance. Longitudinal case studies could be used to follow specific relocation projects and follow up on the performance effects after a period of time. Thereby, researchers could guide firms in their quest for right-shoring, in how to create a balanced manufacturing network and thus, improve operational performance.

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Section 1: The manufacturing network

This first section of the questionnaire asks about the number and locations of the manufacturing plants, and the manufacturing strategy of your company.

		1	2	3-5	6-10	Over 10	N/A
MFGPLA1	How many manufacturing plants are there in your company?	❑	❑	❑	❑	❑	❑

Where are these plants located? (Please select all those that apply)

MFGLOC1	Nordic countries	❑
MFGLOC2	Western Europe (excl. Nordic countries)	❑
MFGLOC3	Eastern Europe	❑
MFGLOC4	North America	❑
MFGLOC5	Latin America	❑
MFGLOC6	China	❑
MFGLOC7	India	❑
MFGLOC8	Asia (excl. China and India)	❑
MFGLOC9	Rest of World (Africa, Middle East, Australia)	❑

		1-50	51-100	101-250	251-500	Over 500	N/A
MFGEMP1	What is the total number of employees in your company?	❑	❑	❑	❑	❑	❑
MFGEMP2	What is the number of employees in your focal plant?	❑	❑	❑	❑	❑	❑

		Yes	No
MFGSTR1	Is your company's competitive strategy based primarily on low costs?	❑	❑
MFGSTR2	Is your company's competitive strategy based primarily on differentiation from competition?	❑	❑
MFGSTR3	Does your company have a corporate-wide strategy for guiding offshoring and reshoring decisions?	❑	❑
MFGSTR4	Does your company have an explicit corporate-wide manufacturing strategy?	❑	❑
MFGSTR5	Does the focal plant have an explicit plant-specific manufacturing strategy?	❑	❑

Section 2: Offshoring of production

This part of the survey is concerned with permanent offshoring to other plants (new or old) that belong to your company or to external partners (contract manufacturer or supplier).

		Not at all	Small extent	Moderate extent	Large extent	Very large extent	N/A
OFFNEXT	To what extent do you expect your company to move production abroad from Den/Fin/Swe in the next 2 years?	❑	❑	❑	❑	❑	❑

		Yes	No	
OFFHIST1	Has your company permanently moved production abroad from Den/Fin/Swe during the last 5 years, either to another plant in your own company or to an external supplier or contract manufacturer?	❑	❑	*If YES: continue with questions below;* *If = NO, go to next section = 3*

	In the last 5 years…	None	1	2	3	4 or more	N/A
OFFHIST2	How many times has production been permanently moved abroad to another plant (either existing or new) in your own company?	❑	❑	❑	❑	❑	❑
OFFHIST3	How many times has production been permanently moved abroad to another company's plant (external supplier or contract manufacturer)?	❑	❑	❑	❑	❑	❑

	In the last 5 years…	Reduced by over 30%	Reduced by 10-30%	No major change	Increased by 10-30%	Increased by over 30%	N/A
OFFHIST4	How many jobs have been affected in the domestic production of your company due to production being moved abroad?	❑	❑	❑	❑	❑	❑
OFFHIST5	How has the sales turnover (or output) been affected in your company's domestic operations by production being moved abroad?	❑	❑	❑	❑	❑	❑

Think of the most recent significant movement of production abroad from your company or plant.
The questions in the rest of this section refer to this movement of production.

OFFYEAR	In which year did the most recent significant movement of production take place?	...

		Yes	No
OFFTOEX	Did production move out to another company's plant abroad (external supplier or contract manufacturer)?	❑	❑
OFFTOIN	Did production move out to another plant abroad that belongs to your company (either existing or new)?	❑	❑

	What are the characteristics of the production that was moved abroad?	Very low	Low	Neither high, nor low	High	Very high	N/A
OFFCHAR1	Production volume	❑	❑	❑	❑	❑	❑
OFFCHAR2	Production complexity	❑	❑	❑	❑	❑	❑
OFFCHAR3	Labor intensity	❑	❑	❑	❑	❑	❑
OFFCHAR4	Product standardization	❑	❑	❑	❑	❑	❑

	To which geographical area was the production moved? (Mark only one option)	
OFFTO1	Another Nordic country	❑
OFFTO2	Rest of Western Europe	❑
OFFTO3	Eastern Europe	❑
OFFTO4	North America	❑
OFFTO5	Latin America	❑
OFFTO6	China	❑
OFFTO7	India	❑
OFFTO8	Asia (excl. China and India)	❑
OFFTO9	Rest of World (Africa, Middle East, Australia)	❑

	Where is the output of the moved production shipped to? (i.e. the market for offshored production; mark all the alternatives that apply)	
OFFMKT1	Another Nordic country	❑
OFFMKT2	Rest of Western Europe	❑
OFFMKT3	Eastern Europe	❑
OFFMKT4	North America	❑
OFFMKT5	Latin America	❑
OFFMKT6	China	❑
OFFMKT7	India	❑
OFFMKT8	Asia (excl. China and India)	❑
OFFMKT9	Rest of World (Africa, Middle East, Australia)	❑

	Please indicate the importance of the following factors in the recent decision to move production abroad:	Very low	Low	Neither high, nor low	High	Very high	N/A
OFFIMP1	Labor cost	❑	❑	❑	❑	❑	❑
OFFIMP2	Logistics cost	❑	❑	❑	❑	❑	❑
OFFIMP3	Other cost	❑	❑	❑	❑	❑	❑
OFFIMP4	Changes in the currency exchange rates	❑	❑	❑	❑	❑	❑
OFFIMP5	Production close to or in the market	❑	❑	❑	❑	❑	❑
OFFIMP6	Access to skills and knowledge	❑	❑	❑	❑	❑	❑
OFFIMP7	Access to technology	❑	❑	❑	❑	❑	❑
OFFIMP8	Access to raw materials	❑	❑	❑	❑	❑	❑
OFFIMP9	Proximity to R&D and product development	❑	❑	❑	❑	❑	❑
OFFIMP10	Flexibility	❑	❑	❑	❑	❑	❑
OFFIMP11	Lead-time	❑	❑	❑	❑	❑	❑
OFFIMP12	Quality	❑	❑	❑	❑	❑	❑
OFFIMP13	Risk diversification	❑	❑	❑	❑	❑	❑
OFFIMP14	Country-specific conditions (e.g. subsidies, taxes, duties)	❑	❑	❑	❑	❑	❑
OFFIMP15	Trade barriers (e.g. customs, quotas, local content requirement)	❑	❑	❑	❑	❑	❑

OFFIMP16	Focus on core areas (and outsource non-core)	❑	❑	❑	❑	❑	❑
OFFIMP17	Avoid investments in new equipment	❑	❑	❑	❑	❑	❑
OFFIMP18	Requirement from customer (to move with customer)	❑	❑	❑	❑	❑	❑
OFFIMP19	Follow industry practice	❑	❑	❑	❑	❑	❑
OFFIMP20	Shortage of qualified personnel	❑	❑	❑	❑	❑	❑
OFFIMP21	Time-to-market (bringing new products to market faster)	❑	❑	❑	❑	❑	❑
OFFIMP22	Something else, please specify:	❑	❑	❑	❑	❑	❑

	Please consider if your company <u>benefitted</u> in the following areas from moving production abroad:	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	N/A
OFFBFT1	Labor costs	❑	❑	❑	❑	❑	❑
OFFBFT2	Logistics costs	❑	❑	❑	❑	❑	❑
OFFBFT3	Other costs	❑	❑	❑	❑	❑	❑
OFFBFT4	Product quality	❑	❑	❑	❑	❑	❑
OFFBFT5	Process quality	❑	❑	❑	❑	❑	❑
OFFBFT6	Delivery speed	❑	❑	❑	❑	❑	❑
OFFBFT7	Delivery reliability	❑	❑	❑	❑	❑	❑
OFFBFT8	Volume flexibility	❑	❑	❑	❑	❑	❑
OFFBFT9	Product mix flexibility	❑	❑	❑	❑	❑	❑
OFFBFT10	Profitability	❑	❑	❑	❑	❑	❑
OFFBFT11	Something else, please specify:	❑	❑	❑	❑	❑	❑

	Please consider if your company experienced problems in the following areas from the implementation of moving production abroad:	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	N/A
OFFPRB1	Labor safety (e.g. accidents at work, work-related illnesses)	❑	❑	❑	❑	❑	❑
OFFPRB2	Labor unrest (e.g. strikes, absenteeism)	❑	❑	❑	❑	❑	❑
OFFPRB3	High labor turnover	❑	❑	❑	❑	❑	❑
OFFPRB4	Natural disasters (e.g. flooding, earthquakes, pandemics)	❑	❑	❑	❑	❑	❑
OFFPRB5	Loss of tacit knowledge (e.g. process knowledge)	❑	❑	❑	❑	❑	❑
OFFPRB6	Incomplete production data (e.g. drawings, parts lists, and bill-of-materials)	❑	❑	❑	❑	❑	❑
OFFPRB7	Product design changes required by legal regulations in the host country	❑	❑	❑	❑	❑	❑
OFFPRB8	Political instability at the receiving location	❑	❑	❑	❑	❑	❑
OFFPRB9	Terrorism, sabotage, piracy, theft, industrial espionage	❑	❑	❑	❑	❑	❑
OFFPRB10	Production competence at the receiving plant	❑	❑	❑	❑	❑	❑
OFFPRB11	Management competence at the receiving plant	❑	❑	❑	❑	❑	❑
OFFPRB12	Lack of cultural understanding (e.g. language barriers, cultural differences)	❑	❑	❑	❑	❑	❑
OFFPRB13	IT security (e.g. attempted attacks on networks)	❑	❑	❑	❑	❑	❑
OFFPRB14	Corporate social responsibility issues (e.g. corruption, child labor, working conditions)	❑	❑	❑	❑	❑	❑
OFFPRB15	Environmental issues (e.g. pollution, carbon footprint)	❑	❑	❑	❑	❑	❑
OFFPRB16	Violation of intellectual property rights (IPR)	❑	❑	❑	❑	❑	❑
OFFPRB17	Something else, please specify:	❑	❑	❑	❑	❑	❑

Section 3: Reshoring of manufacturing

This third part of the survey is concerned with permanent reshoring from other plants that belong to your company or from external partners (contract manufacturer or supplier).

	In the next 2 years, to what extent do you expect your company to move production back …	Not at all	Small extent	Moderate extent	Large extent	Very large extent	N/A
RESNEXT1	To Den/Fin/Swe	❑	❑	❑	❑	❑	❑
RESNEXT2	To another plant in your company, located in the Nordic region	❑	❑	❑	❑	❑	❑
RESNEXT3	To another plant in your company, located in some other European country	❑	❑	❑	❑	❑	❑

		Yes	No	
RESHIST1	Has your company permanently moved production back to Den/Fin/Swe from abroad during the last 5 years, either from another plant of your own company, or from an external supplier or contract manufacturer?	❑	❑	*If YES: continue with questions below;* *If NO, go to next section = 4*

	In the last 5 years…	None	1	2	3	4 or more	N/A
RESHIST2	How many times has production been permanently moved back to Den/Fin/Swe from another plant in your own company?	❑	❑	❑	❑	❑	❑
RESHIST3	How many times has production been permanently moved back to Den/Fin/Swe from an external supplier or contract manufacturer?	❑	❑	❑	❑	❑	❑

	In the last 5 years…	Reduced by > 30%	Reduced by 10-30%	No major change	Increased by 10-30%	Increased by > 30%	N/A
RESHIST4	How many jobs have been affected in the domestic production of your company due to production being moved back to Den/Fin/Swe?	❑	❑	❑	❑	❑	❑
RESHIST5	How has the sales turnover (or output) been affected in your company's domestic operations by production being moved back to Den/Fin/Swe?	❑	❑	❑	❑	❑	❑

Think of the most recent significant movement of production back to the plant in Den/Fin/Swe.
The questions in the rest of this section refer to this movement of production.

RESYEAR	In which year did this movement of production take place?	...

	Did production in this movement come ...	Yes	No
RESFRMEX	from an external contract manufacturer or supplier?	❑	❑
RESFRMIN	from another plant abroad that belongs to your company?	❑	❑

	What are the characteristics of this production?	Very low	Low	Neither high, nor low	High	Very high	N/A
RESCHAR1	Production volume	❑	❑	❑	❑	❑	❑
RESCHAR2	Production complexity	❑	❑	❑	❑	❑	❑
RESCHAR3	Labor intensity	❑	❑	❑	❑	❑	❑
RESCHAR4	Product standardization	❑	❑	❑	❑	❑	❑

	From which geographical area was production moved? (Mark only one option)	
RESFRM1	Another Nordic country	❑
RESFRM2	Rest of Western Europe	❑
RESFRM3	Eastern Europe	❑
RESFRM4	North America	❑
RESFRM5	Latin America	❑
RESFRM6	China	❑
RESFRM7	India	❑
RESFRM8	Asia (excl. China and India)	❑
RESFRM9	Rest of World (Africa, Middle East, Australia)	❑

Where is the output of this production shipped to?
(i.e. the market for reshored production; mark all the alternatives that apply)?

RESMKT1	The Nordic countries	❑
RESMKT2	Rest of Western Europe	❑
RSSMKT3	Eastern Europe	❑
RESMKT4	North America	❑
RESMKT5	Latin America	❑
RSSMKT6	China	❑
RESMKT7	India	❑
RESMKT8	Asia (excl. China and India)	❑
RESMKT9	Rest of World (Africa, Middle East, Australia)	❑

	Please indicate the <u>importance</u> of the following factors in the recent decision to move production back:	Very low	Low	Neither high, nor low	High	Very high	N/A
RESIMP1	Labor cost	❑	❑	❑	❑	❑	❑
RESIMP2	Logistics cost	❑	❑	❑	❑	❑	❑
RESIMP3	Other cost	❑	❑	❑	❑	❑	❑
RESIMP4	Changes in the currency exchange rates	❑	❑	❑	❑	❑	❑
RESIMP5	Production close to or in the market	❑	❑	❑	❑	❑	❑
RESIMP6	Access to skills and knowledge	❑	❑	❑	❑	❑	❑
RESIMP7	Access to technology	❑	❑	❑	❑	❑	❑
RESIMP8	Access to raw materials	❑	❑	❑	❑	❑	❑
RESIMP9	Proximity to R&D and product development	❑	❑	❑	❑	❑	❑
RESIMP10	Flexibility	❑	❑	❑	❑	❑	❑
RESIMP11	Lead-time	❑	❑	❑	❑	❑	❑
RESIMP12	Quality	❑	❑	❑	❑	❑	❑
RESIMP13	Risk diversification	❑	❑	❑	❑	❑	❑
RESIMP14	Country-specific conditions (e.g. subsidies, taxes, duties)	❑	❑	❑	❑	❑	❑
RESIMP15	Trade barriers (e.g. customs, quotas, local content requirement)	❑	❑	❑	❑	❑	❑

RESIMP16	Focus on core areas (and outsource non-core)	❑	❑	❑	❑	❑	❑
RESIMP17	Avoid investments in new equipment	❑	❑	❑	❑	❑	❑
RESIMP18	Requirement from customer (to move with customer)	❑	❑	❑	❑	❑	❑
RESIMP19	Follow industry practice	❑	❑	❑	❑	❑	❑
RESIMP20	Shortage of qualified personnel	❑	❑	❑	❑	❑	❑
RESIMP21	Time-to-market (bringing new products to market faster)	❑	❑	❑	❑	❑	❑
RESIMP22	Something else, please specify:	❑	❑	❑	❑	❑	❑

	Please consider if your company benefitted in the following areas from moving production back.	Strongly disagree	Somewhat disagree	Neither agree, nor disagree	Somewhat agree	Strongly agree
RESBFT1	Labor costs	❑	❑	❑	❑	❑
RESBFT2	Logistics costs	❑	❑	❑	❑	❑
RESBFT3	Other costs	❑	❑	❑	❑	❑
RESBFT4	Product quality	❑	❑	❑	❑	❑
RESBFT5	Process quality	❑	❑	❑	❑	❑
RESBFT6	Delivery speed	❑	❑	❑	❑	❑
RESBFT7	Delivery reliability	❑	❑	❑	❑	❑
RESBFT8	Volume flexibility	❑	❑	❑	❑	❑
RESBFT9	Product mix flexibility	❑	❑	❑	❑	❑
RESBFT10	Profitability	❑	❑	❑	❑	❑
RESBFT11	Something else, please specify:	❑	❑	❑	❑	❑

	To what extent did your company experience problems at the former plant or company (from where production was moved) in the following areas:	Not at all	Small extent	Moderate extent	Large extent	Very large extent
RESPRB1	Labor safety (e.g. accidents at work, work-related illnesses)	❑	❑	❑	❑	❑
RESPRB2	Labor unrest (e.g. strikes, absenteeism)	❑	❑	❑	❑	❑
RESPRB3	High labor turnover	❑	❑	❑	❑	❑
RESPRB4	Natural disasters (e.g. flooding, earthquakes, pandemics)	❑	❑	❑	❑	❑
RESPRB5	Loss of tacit knowledge (e.g. process knowledge)	❑	❑	❑	❑	❑
RESPRB6	Incomplete production data (e.g. drawings, parts lists, and bill-of-materials)	❑	❑	❑	❑	❑
RESPRB7	Product design changes required by legal regulations in the host country	❑	❑	❑	❑	❑
RESPRB8	Political instability	❑	❑	❑	❑	❑
RESPRB9	Terrorism, sabotage, piracy, theft, industrial espionage	❑	❑	❑	❑	❑
RESPRB10	Production competence at the receiving plant	❑	❑	❑	❑	❑
RESPRB11	Management competence at the receiving plant	❑	❑	❑	❑	❑
RESPRB12	Lack of cultural understanding (e.g. language barriers, cultural differences)	❑	❑	❑	❑	❑
RESPRB13	IT security (e.g. attempted attacks on networks)	❑	❑	❑	❑	❑
RESPRB14	Corporate social responsibility issues (e.g. corruption, child labor, working conditions)	❑	❑	❑	❑	❑
RESPRB15	Environmental issues (e.g. pollution, carbon footprint)	❑	❑	❑	❑	❑
RESPRB16	Violation of intellectual property rights (IPR)	❑	❑	❑	❑	❑
RESPRB17	Something else, please specify:	❑	❑	❑	❑	❑

Section 4: Decision making and performance

This part of the questionnaire is concerned with aspects that can be related to offshoring and reshoring, such as choosing production locations, manufacturing innovations, the use of financial information, and the resulting performance outcomes. Please respond to the questions thinking about your company and the focal plant.

This section deals with your company's strategy of choosing production locations.

	To what extent do you agree or disagree with the following statements about the role of production location choices in your company's strategy?	Strongly disagree	Somewhat disagree	Neither agree, nor disagree	Somewhat agree	Strongly agree	N/A
LOCSTR1	Production location choices have a central role in our company's strategy.	❑	❑	❑	❑	❑	❑
LOCSTR2	Offshoring is important to this company's competitiveness.	❑	❑	❑	❑	❑	❑
LOCSTR3	Reshoring is important to this company's competitiveness.	❑	❑	❑	❑	❑	❑
LOCSTR4	Changes in production locations receive a lot of attention in our company.	❑	❑	❑	❑	❑	❑
LOCSTR5	Changes of production locations will influence the direction of this company's business.	❑	❑	❑	❑	❑	❑
LOCSTR6	Offshoring and reshoring are strategic alternatives for our global manufacturing footprint.	❑	❑	❑	❑	❑	❑

Please consider what kinds of manufacturing innovations your company and the focal plant is pursuing and what changes have taken place in manufacturing. By manufacturing innovation, we mean any changes and improvements that are new to the plant, firm or the world.

	To what extent is your company pursuing the following manufacturing related innovations?	Not at all	Small extent	Moderate extent	Large extent	Very large extent	N/A
MFGINN1	Digitalization, (e.g. industrial internet, context-awareness and sensor-based technologies)	❑	❑	❑	❑	❑	❑
MFGINN2	New high-tech materials, (e.g. ultra-light or high-strength materials, post batteries)	❑	❑	❑	❑	❑	❑
MFGINN3	New process technologies, (e.g. additive manufacturing)	❑	❑	❑	❑	❑	❑
MFGINN4	Automation and robotization	❑	❑	❑	❑	❑	❑
MFGINN5	Other, please specify:	❑	❑	❑	❑	❑	❑

	In the last 5 years, to what extent has your company implemented the following?	Not at all	Small extent	Moderate extent	Large extent	Very large extent	N/A
INTINN1	Business process improvements	❑	❑	❑	❑	❑	❑
INTINN2	Reorganization of manufacturing resources	❑	❑	❑	❑	❑	❑
INTINN3	Changes in the firm's earnings logic	❑	❑	❑	❑	❑	❑
INTINN4	Changes in manufacturing routines	❑	❑	❑	❑	❑	❑
EXTINN1	New customer relationships	❑	❑	❑	❑	❑	❑
EXTINN2	New kinds of services towards the customers	❑	❑	❑	❑	❑	❑
EXTINN3	Cooperation with competitors	❑	❑	❑	❑	❑	❑
EXTINN4	New supplier relationships	❑	❑	❑	❑	❑	❑

	In the last 5 years, to what extent have the following issues become obsolete or outdated in your company?	Not at all	Small extent	Moderate extent	Large extent	Very large extent	N/A
DISRINN1	Some processes	❑	❑	❑	❑	❑	❑
DISRINN2	Some value propositions towards customers	❑	❑	❑	❑	❑	❑
DISRINN3	Some key customer relationships	❑	❑	❑	❑	❑	❑
DISRINN4	Some supply/delivery chains	❑	❑	❑	❑	❑	❑
DISRINN5	Some key supplier partnerships	❑	❑	❑	❑	❑	❑

Next, please consider the use of financial information in decision making in your company/focal plant.

	What is the division of the total product cost in your focal plant into direct material, direct labor and overhead? (Sum up to 100%)	
COSSTR1	Direct materials and services	
COSSTR2	Direct labor	
COSSTR3	Overhead	
	Total	100

	To what extent does your cost accounting system provide data that allow you to analyze costs at the following levels?	Not at all	Small extent	Moderate extent	Large extent	Very large extent	N/A
COSTACC1	Component level, i.e. individual items	❑	❑	❑	❑	❑	❑
COSTACC2	Product level, i.e. finished end products	❑	❑	❑	❑	❑	❑
COSTACC3	Process level, e.g. assembly, packaging, parts manufacturing	❑	❑	❑	❑	❑	❑
COSTACC4	Plant level, i.e. total manufacturing costs and cost of goods sold	❑	❑	❑	❑	❑	❑

	To what extent do your reporting practices support accurate financial analysis at the following levels?	Not at all	Small extent	Moderate extent	Large extent	Very large extent	N/A
FINANAL1	Product full cost	❑	❑	❑	❑	❑	❑
FINANAL2	Product profitability	❑	❑	❑	❑	❑	❑
FINANAL3	Plant profitability	❑	❑	❑	❑	❑	❑

	To what extent do your financial reporting practices support decision making at the following situations?	Not at all	Small extent	Moderate extent	Large extent	Very large extent	N/A
DECMAK1	Supply base structure (e.g. supplier selection)	❑	❑	❑	❑	❑	❑
DECMAK2	Choosing plant location	❑	❑	❑	❑	❑	❑
DECMAK3	Selecting the most competitive delivery channels	❑	❑	❑	❑	❑	❑

The following questions deal with the performance of your focal plant in relation to selected strategic aspects of manufacturing.

	To what extent do you agree or disagree with the following statements concerning the performance of your company:	Strongly disagree	Somewhat disagree	Neither agree, nor disagree	Somewhat agree	Strongly agree	N/A
PERF1	We have reduced our unit costs during the last 3 years, e.g. labor cost per hour.	❑	❑	❑	❑	❑	❑
PERF2	We have reduced our total cost during the last 3 years, e.g. total product cost including overhead.	❑	❑	❑	❑	❑	❑
PERF3	Our productivity has increased during the last 3 years, e.g. labor productivity.	❑	❑	❑	❑	❑	❑
PERF4	We have improved the profitability of our products during the last 3 years, e.g. EBIT% at product level.	❑	❑	❑	❑	❑	❑
PERF5	We are among the leaders in our industry in terms of product quality.	❑	❑	❑	❑	❑	❑
PERF6	We are among the leaders in our industry in terms of delivery lead-times.	❑	❑	❑	❑	❑	❑
PERF7	We are among the leaders in our industry in terms of flexibility.	❑	❑	❑	❑	❑	❑
PERF8	Technological innovations have brought us considerable strategic advantage.	❑	❑	❑	❑	❑	❑
PERF9	We are at a risk of losing know-how and intellectual property rights.	❑	❑	❑	❑	❑	❑

Section 5: Background information about the company and the respondent

To which industry does your focal plant primarily belong?
(Mark only one)

INDUSTR1	Food industry (10)	❑
INDUSTR2	Beverage industry (11)	❑
INDUSTR3	Tobacco industry (12)	❑
INDUSTR4	Textile and clothing industry (13, 14)	❑
INDUSTR5	Leather and related products (15)	❑
INDUSTR6	Timber industry (16)	❑
INDUSTR7	Paper industry (17)	❑
INDUSTR8	Graphical industry (18)	❑
INDUSTR9	Petroleum industry (19)	❑
INDUSTR10	Chemical industry (20)	❑
INDUSTR11	Pharmaceuticals Industry (21)	❑
INDUSTR12	Rubber and plastics industry (22)	❑
INDUSTR13	Other non-metallic mineral products industry (23)	❑
INDUSTR14	Basic metals industry (24)	❑
INDUSTR15	Fabricated metal products, except machinery & equipment (25)	❑
INDUSTR16	Computer, electronic and optical products (26)	❑
INDUSTR17	Electrical equipment (27)	❑
INDUSTR18	Machinery industry and equipment (28)	❑
INDUSTR19	Motor vehicle, trailer and semi-trailer industry (29)	❑
INDUSTR20	Transport equipment industry (30)	❑
INDUSTR21	Furniture industry (31)	❑
INDUSTR22	Other manufacturing (32)	❑
INDUSTR23	Repair and installation of machinery and equipment (33)	❑

		0-5%	6-25%	26-50%	Over 50%	N/A
SALESHAR	What is the share of sales from your focal plant that comes from products that have been introduced during the last two years?	❑	❑	❑	❑	❑

What is the primary manufacturing mode of your focal plant? (Mark only one option)

CODP1ETO	Engineer-to-order	❑
CODP2MTO	Make-to-order	❑
CODP3ATO	Assemble-to-order	❑
CODP4MTS	Make-to-stock	❑

What type of products does your focal plant primarily manufacture? (Mark only one option)

PRODSTD	Standard products	❑
PRODCUST	Customized products	❑
PRODMIX	A mix of standard and customized products	❑

Where is the primary market for the products from your focal plant? (Mark only one)

PLAMKT1	Domestic	❑
PLAMKT2	Nordic	❑
PLAMKT3	European	❑
PLAMKT4	Global	❑

Which of the following alternatives best describes your own area of responsibility?

RESPOND1	Global Operations Director or Manager	❑
RESPOND2	Supply Chain Director or Manager	❑
RESPOND3	Plant Director or Manager	❑
RESPOND4	Production Manager	❑
RESPOND5	Production Expert	❑
RESPOND6	Other, please specify:	❑

RESPOND7	Please give the total number of years that you have worked in production and operations management:	...
RESPOND8	Please give the number of years that you have worked in your current job position:	...

Please provide your email address, so we can send you the reports from the study: an overview of the Swedish results and a comparison with Danish and Finnish results:

EMAIL	

Please give any comments related to this survey in the space below:

Thank you for completing this survey!

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