Manufacturing backsourcing: A case study of a company's process framework

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Abstract
The purpose of this study is to examine the backsourcing process. Based on previous research and lessons learned from a case study of a supplier of maritime equipment in a Scandinavian cluster, important drivers, activities and challenges related to the backsourcing process are identified. The key contribution of this research is the development of a stepwise model of how companies can backsource. It is a framework describing how companies can conduct the backsourcing process, which consists of four phases comprised of different objectives and activities. Moreover, three main challenges are identified, namely limitations in capacity, re-building knowledge, and adapting the backsourced product to the production site. In addition to filling a gap in the existing literature, the framework can also be used as an analytic tool to help managers deal with the decisions and challenges related to the backsourcing process.

Keywords: backsourcing, manufacturing industry, sourcing process

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1. Introduction

Since the 1990s, outsourcing has become a common business practice for western companies (Lacity and Willcocks, 2000b, Venkatraman, 2004, Jensen and Pedersen, 2011). The growing number of companies that decide to outsource activities, stress that they face fierce competition and are forced to seek other options in order to maintain or strengthen their competitiveness. The outsourcing of manufacturing flows to low-cost destinations in Asia and Central and Eastern Europe (Jensen and Pedersen, 2011). Many companies, however, experience that their outsourcing contracts fail to deliver the objectives they set out to achieve, and as a consequence, some companies decide to bring the outsourced activity back in-house (Kinkel et al., 2007, Veltri et al., 2008, Kotlarsky and Bognar, 2012, Fratocchi et al., 2016, Ejodame and Oshri, 2018). This process is termed backsourcing and denotes bringing back activities in-house that have been outsourced to external suppliers (Bhagwatwar et al., 2011, Ejodame and Oshri, 2018).

In this study we explore the backsourcing phenomenon. Previous research regarding backsourcing has mainly focused on the process until the decision to backsource has been made. The focus has been on identifying the drivers and motivation for backsourcing (Veltri et al., 2008, Bhagwatwar et al., 2011, Kotlarsky and Bognar, 2012, Nagpal, 2015). Research concerning what happens after the decision to backsource has been made and the contract with the external supplier has been terminated, is rather limited. Solli-Sæther and Gottschalk (2015) argue that better understanding of the processes and internal challenges involved has a significant influence on the success of backsourcing. A few studies have described the process of backsourcing, such as Kotlarsky and Bognar (2012), while others have focused on the challenge of knowledge re-integration (Bhagwatwar et al., 2011, Nujen and Damm, 2016). However, there is a clear absence of theoretical models or recommendations for how companies can conduct the backsourcing process. This study contributes to the literature by developing a stepwise model of how companies can conduct this process. The paper also contributes towards identifying internal challenges that should be considered when bringing back outsourced work in-house. We address the following two research questions: 1) *How do companies conduct the backsourcing process*? and 2) *What are the internal challenges concerning the backsourcing process?*

To answer these questions, a qualitative case study is presented and discussed. The case was purposefully selected for its expected capacity to provide relevant information and knowledge to shed light on and answer the research questions. The case focuses on a Scandinavian maritime technology supplier's experience with a backsourcing project. For many years the supplier had outsourced most of their production to other countries, but because of market changes and technology development they decided to backsource all their production. Several of their products had already been backsourced with success and because of that we were able to study the whole backsourcing process in detail; from the drivers and motivations for backsourcing, to the different phases the company went through when backsourcing, to the internal challenges that occurred during this process.

In the next section, we present the theoretical framework. Then in section three, we describe the research methodology. In section four, we present the case and findings from the interviews and the data analysis. Next, we discuss the findings and answer the research questions. Finally,

in section six, we present the study's conclusions, implications, limitations and recommendations for future research.

2. Theoretical framework

Backsourcing is part of a larger set of sourcing decisions. Sourcing, as defined by Oshri et al. (2011, p. 2), is "the act through which work is contracted or delegated to an external or internal entity that could be physically located anywhere." It encompasses various insourcing and outsourcing arrangements, whereas the first sourcing decision a firm faces is the make-or-buy decision. If a company decides to buy from external suppliers, it will, at some point, reach a re-evaluation point where it must decide whether to continue outsourcing with the current supplier, find a new supplier, or backsource (Veltri et al., 2008).

This section starts with a clarification of concepts related to the sourcing process. This will be followed by a description of the drivers or motivations for insourcing, outsourcing and backsourcing. The section then presents the process for insourcing, outsourcing, and backsourcing. After this presentation, the paper focuses on backsourcing, where internal challenges related to the backsourcing process are described.

2.1 Clarification of concepts

Sourcing decisions are at the core of the international business literature. It is claimed that how the internationalization of companies' unfolds, is dependent on motives, whether they are market seeking, efficiency seeking, resource seeking or strategic asset-seeking (Dunning, 1993). As sourcing includes many different concepts and aspects we clarify the key concepts in Table 1 as they are used throughout in this paper.

Table 1. Clarification of key concepts

Conception	Definition
Insourcing	Internal sourcing of business activities (Schniederjans et al., 2015)
Outsourcing	The process where activities, assets and/or people are contracted out or sold to a third-party supplier, who manages and provides the assets/services for an agreed fee and time period (Kern and Willcocks, 2002)
Global outsourcing (offshoring)	Relocating business processes overseas to countries with lower costs without significantly reducing quality (Venkatraman, 2004)
Backsourcing	The process where a client firm brings previously outsourced services from a supplier back in-house (Ejodame and Oshri, 2018)
Reshoring (backshoring)	Moving activities back to the organization's country of origin, but does not necessarily imply that the organization takes the activity back in-house (Ancarani et al., 2015)

Insourcing can be defined as "internal sourcing of business activities" (Schniederjans et al., 2015, p. 3) and involves keeping work within the organization (Oshri et al., 2011). Hirschheim and Lacity (2000) refers to insourcing as the practice where outsourcing has been evaluated but internal use was confirmed to achieve the same objective, thus the activity is still completed internally. The decision to keep activities within the organization comes with several benefits, such as control over production activities and quality, and is a normal starting point for most companies (Schniederjans et al., 2015). Nevertheless, as a firm grows and matures, it may struggle to compete with companies that outsource as these companies might have reduced costs or access to other resources and skills through outsourcing activities (Schniederjans et al., 2015).

Outsourcing is a phenomenon that originates from the 1950s, but it was in the early 1990s that outsourcing really started to increase in popularity (Hätönen and Eriksson, 2009). The term outsourcing can be defined as "turning over all or part of an organizational activity to an outside

vendor" (Barthélemy, 2003, p. 87) or as "the transfer of the production of goods or services that had been performed internally to an external party" (Ellram and Billington, 2001, p. 16). According to Kern and Willcocks (2002), outsourcing is the process where activities, assets and/or people are contracted out or sold to a third-party supplier, who manages and provides the assets/services for an agreed fee and time period. Although these definitions have slightly different perspectives on the phenomenon, they both indicate that outsourcing entails the transfer of ownership of an activity to an external party (Hätönen and Eriksson, 2009).

Offshore outsourcing (or just offshoring) is another concept that gained popularity in the 1990s, and is one of the most discussed topics today (Hätönen and Eriksson, 2009). Offshore outsourcing can be defined as a "situation in which there exists simultaneous transfer of ownership and location of an activity" (Hätönen and Eriksson, 2009, p. 147). Offshoring refers to the practices of US and European companies relocating their business processes overseas to countries with lower costs without significantly reducing quality (Venkatraman, 2004). This definition focuses on US and European firms, but this is not entirely the case, since firms in other locations can also relocate business to lower cost countries or for other reasons. Additionally, it is possible to define nearshore outsourcing, which indicates that the chosen country is geographically close (Schniederjans et al., 2015). In other words, it involves moving activities across national borders. Offshoring may be done in two ways: (1) through using external resources, or (2) through the relocation of internal production activities (FDI) (Hätönen and Eriksson, 2009). The distinction between these two ways of offshoring is related to the ownership-rights of an activity, and this two-fold nature of the concept is the reason why the term is often misunderstood (Hätönen and Eriksson, 2009).

Backsourcing can, according to an information technology perspective, be defined as "a business practice in which a company takes back in-house assets, activities, and skills that are part of its information systems operations, and were previously outsourced to one or more outside IS providers" (Veltri et al., 2008, p. 51). From a manufacturing perspective, backsourcing involves a "recall of activities back in-house that previously have been (globally) outsourced" (Nujen et al., 2015, p. 3). Ejodame and Oshri (2018) describe backsourcing as the process where a client firm brings previously outsourced services from a supplier back in-house. Although these definitions have slightly different perspectives, they both capture the essence of backsourcing, which is a return of functions or activities to the original organization.

The term backsourcing differs from the term "reshoring" or "backshoring" as the goal of backsourcing is to rebuild competences and capabilities internally in the organization, whereas reshoring/backshoring involves moving activities back to the organization's country of origin, but does not necessarily imply that the organization take the activity back in-house (Ancarani et al., 2015, Lacity et al., 2008, Nujen et al., 2015). Reshoring denotes the relocation of the activity to geographically closer locations, either domestic or nearshore countries. The reshoring decision is the reversal of a previous decision to offshore, where the definition does not take ownership mode into account and can be applied to all or a part of offshored activities (Foerstl et al., 2016). This definition includes two distinct geographical decisions: backshoring, which is relocation to the home country; and nearshoring to a geographically close country.

2.2 Drivers of different sourcing arrangements

Insourcing is often perceived as a normal starting point for most companies and comes with several benefits, such as control over production activities, capabilities, and product/service quality (Schniederjans et al., 2015). Furthermore, the internal sourcing of activities allows the focal company to be more flexible in its business activities and less exposed to risks than firms that outsource activities. Insourcing may also have a positive effect on employees as outsourcing may threaten employees' morale and feelings of job security (Schniederjans et al.,

2015). Management can use outsourcing evaluations to confirm that continued insourcing is the most viable option (Hirschheim and Lacity, 2000).

The decision to outsource was previously motivated first and foremost by a desire to reduce costs. More recent studies indicate that there are several other motivations, or drivers, for outsourcing activities. Value creation and competitive advantage are important concepts for every firm. There are different motives and drivers, which can lead a firm to outsource activities such as lower costs, access to new markets, flexibility, quality, external pressure (Solli-Sæther and Gottschalk, 2007). Studies also indicate that outsourcing allows the focal company to focus on core competencies (Schniederjans et al., 2015). This is further supported by Hätönen and Eriksson (2009) who suggest that the motives for outsourcing have gradually evolved since the 1980s until today. In the 1980s to the 1990s the prime motive for outsourcing was to reduce costs, while from the 1990s to the early 2000s, the prime motive had matured to reducing costs, enhancing capabilities, and improving processes. From the early 2000s onwards, the prime motive for outsourcing has been organizational transformation (Hätönen and Eriksson, 2009).

Kinkel and Maloca (2009) conducted a quantitative analysis concerning offshoring motives for production and manufacturing firms in Germany. Their research did not differ between offshore insourcing and offshore outsourcing. However, their findings are still relevant as offshoring and outsourcing often share the same drivers but embody different practical implementations. By far the most important driver in all the years investigated (1999, 2003, 2006) was reduced labor costs. This motive was followed by market opening, capacity bottlenecks and proximity to customers.

Outsourcing and offshoring have become common business practices in many Western companies, but far from all businesses succeed. A US survey shows that as many as 70% of US companies have negative experiences with offshoring of IT and that 25% of these companies have brought their services back in-house (Veltri et al., 2008, Ejodame and Oshri, 2018). Backsourcing entails a recall of activities in-house that were outsourced to external suppliers. In general, the decision to backsource is motivated by several drivers. Veltri et al. (2008) identified three major reasons for information systems backsourcing, namely outsourcing contract problems, opportunities arising from internal organizational changes, and opportunities arising from external environmental changes. Contract problems include higher than expected costs, poor service quality, loss of control over outsourced services, and/or know-how mismatch. Internally generated opportunities may be motivated by change in executive management or changes in business strategy. Externally generated opportunities occur as a result of external business changes in the environment, such as changes in the external market or changes in society (Veltri et al., 2008). Kinkel and Maloca (2009) investigated drivers for backshoring to Germany and found that flexibility, quality issues, coordination costs, insufficient infrastructure and lack of qualified personnel were important drivers for German firms. Their findings support the notion that backshoring decisions are short-term reactions to issues in supply chain management rather than strategic choices.

Although reshoring and backsourcing are two different sourcing strategies, the drivers for reshoring are perceived as relevant for backsourcing as both strategies involve a moving of activities back to the country of origin. Wiesmann et al.'s (2017) literature review on the drivers and barriers to reshoring identified five different sets of dynamics associated with reshoring – global competitive dynamics, host country, home country, supply chain, and firm specific.

Sourcing decisions are heavily influenced by drivers, risk, location and activity. All these considerations are interconnected and cannot be viewed independently. The sourcing arrangement and its drivers are closely connected and indicate what a company aims to achieve

through outsourcing. Following this decision, risks and location choices have to be analyzed jointly to arrive at an appropriate sourcing decision. An overview off different sourcing arrangements and their drivers is presented in Table 2. A firm could arrive at the conclusion that insourcing or outsourcing is the appropriate choice. Also, backsourcing, and thus the reversal of the outsourcing decision is an ever-present possibility for a firm.

Table 2. Drivers of different sourcing arrangements

Sourcing arrangement	Drivers and indicative literature
Insourcing	• Control over production activities, capabilities, product/service quality (Schniederjans et al., 2015)
Outsourcing	• Lower cost, access to new markets, flexibility, quality, external pressure (Solli-Sæther and Gottschalk, 2007) • Focus on core competencies (Schniederjans et al., 2015). • Reducing costs, enhancing capabilities, improving processes, organizational transformation (Hätönen and Eriksson, 2009)
Global outsourcing (offshoring)	• Reduced labour costs, market opening, capacity bottlenecks and vicinity to customers (Kinkel and Maloca, 2009)
Backsourcing	• Contract problems, opportunities arising from internal and external organizational changes (Veltri et al., 2008) • Flexibility, quality issues, coordination costs, insufficient infrastructure and lack of qualified personnel (Kinkel and Maloca, 2009)
Reshoring (backshoring)	• Global competitive dynamics, host country, home country, supply chain, and firm specific (Wiesmann et al., 2017)

2.3 The process of backsourcing

There are several studies available regarding the outsourcing process. Lacity and Willcocks (2000a) studied IT outsourcing relationships and identified six relationship phases (i.e., scoping, evaluation, negotiation, transition, middle, and mature phase) companies go through when outsourcing activities to external suppliers. The overall goal and objective varies in the different phases, and the activities are designed to underpin the different goals and objectives in the different phases (Lacity and Willcocks, 2000a).

To our understanding there is no available theoretical recommendations for how companies can conduct the backsourcing process; the theoretical foundation for this paper is rather limited. It is expected that the process of backsourcing is a somewhat reversed model of the outsourcing process, thus the theoretical framework for outsourcing can provide useful insights into the development of a stepwise model of how companies can conduct the backsourcing process. In this paper we analyse different attributes of the backsourcing process of one single company, such as phases, objectives, and activities. The primary purpose is to strengthen the theoretical understanding of the backsourcing process. This approach is adapted from Lacity and Willcocks (2000a).

There are several challenges related to the process of bringing an activity back in-house. Not only is backsourcing a demanding process, but after the activity has been brought back, the company must handle different challenges related to organizational adjustments, changing government structures, and the development of new skills and capacity. Although research regarding the internal challenges related to the backsourcing process is rather limited, one important and interesting challenge has been identified and discussed in previous studies, namely the re-integration of knowledge (Bhagwatwar et al., 2011, Nujen et al., 2015).

3. Research method

In order to gain as much insight as possible, we chose what Jacobsen (2005) refers to as an intensive research design. The aim was to gain in-depth and nuanced data from a low number of units, where individual understanding and interpretation were to be highlighted and analyzed. Furthermore, the research questions required a design that was sensitive to unexpected information and contextual factors, because of the exploratory nature of the study (Eisenhardt, 1989, Yin, 2009). We found that a single case-study design would be fitting for our research, with the unit of analysis being the specific backsourcing project. Case studies using qualitative data are especially appropriate for exploratory research when the goal is an in-depth understanding of a phenomenon in its context (Eisenhardt, 1989, Yin, 2009). By choosing this design, we were able to gain detailed information about the backsourcing process and internal challenges related to bringing back outsourced work in-house.

When selecting the case, we used the method of purposeful sampling (Flyvbjerg, 2006). This sampling process is based on the assumption that the investigator wants to discover, understand and gain insight and therefore must select the case from which the most can be learned. This requires access to key informants in the field who can help in identifying information-rich cases (Suri, 2011). We had three criteria when selecting the case: (1) a western company that had outsourced a large part of their production to low-cost countries, (2) what was brought back had to be an extensive part of the company's production, (3) the backsourcing process had to be successful. We chose to study a backsourcing project by a Scandinavian maritime technology supplier, which fulfilled all these criteria. We also chose this company because of its expected capacity to provide data and relevant information. The company's unique market position as a world leader in the supply of winches for anchor handling vessels and its strong company culture and history make this a unique case that is both relevant and applicable to other manufacturing companies. The company also represent an important type of industry that has started to take back activities from external suppliers due to external environmental changes such as changes in demand and access to new technology.

The data were collected through in-depth, semi-structured interviews, between January 2017 and April 2017, as the company recalled activities in-house that had been outsourced. Eleven interviews were conducted: seven from the ship technology supplier, two from the customer site, and two from the supplier site. It was important that the interviewees represented different stakeholders. The purpose of these interviews was to uncover the impact of backsourcing on the focal company's competitive advantage as seen from different perspectives.

The qualitative interviews we conducted were one-on-one interviews (Patton, 2002). Respondents were asked questions about strategic drivers for outsourcing and backsourcing, the backsourcing process and internal challenges related to backsourcing; for example: "What was the background and drivers for backsourcing?", "Can you describe the process of moving production back in-house?", "Were there any internal challenges that occurred during the backsourcing process?" and "How were the challenges managed?" The duration of each interview was around one hour. The same researcher conducted all the interviews to assure consistency. The interviews were conducted face-to-face, and when necessary, follow-up interviews and emails were exchanged to discuss unclear data. Each interview was documented as soon as possible after the interview to preserve accuracy; thereafter, the documented interview was returned to the interviewee for approval.

As data needed to be analysed and interpreted, we used a content-analysis approach (Patton, 2002). In the analysis, we looked for and identified pertinent patterns and similarities in the responses. In addition to interviews, a literature review was conducted to explore the research on effective backsourcing. By cross-referencing the results from the interviews and the

literature review, the mechanisms that influenced the backsourcing process in ship technology manufacturing were derived as research findings.

4. The case company

The Scandinavian maritime technology supplier we studied is an engineering and production company with approximately 150 employees. It was founded in the 1880s as a fishing and agricultural company. Today, the core activities include sales, engineering, procurement and manufacturing of anchor handling winches. Engineering involves making calculations, sketches and product specifications for the manufacturing and procurement departments. The manufacturing department, or production, uses the sketches from the engineering department to produce the physical product, while the procurement department uses the sketches to purchase raw material for the production department and, if needed, potentially outsource parts of the production to external vendors.

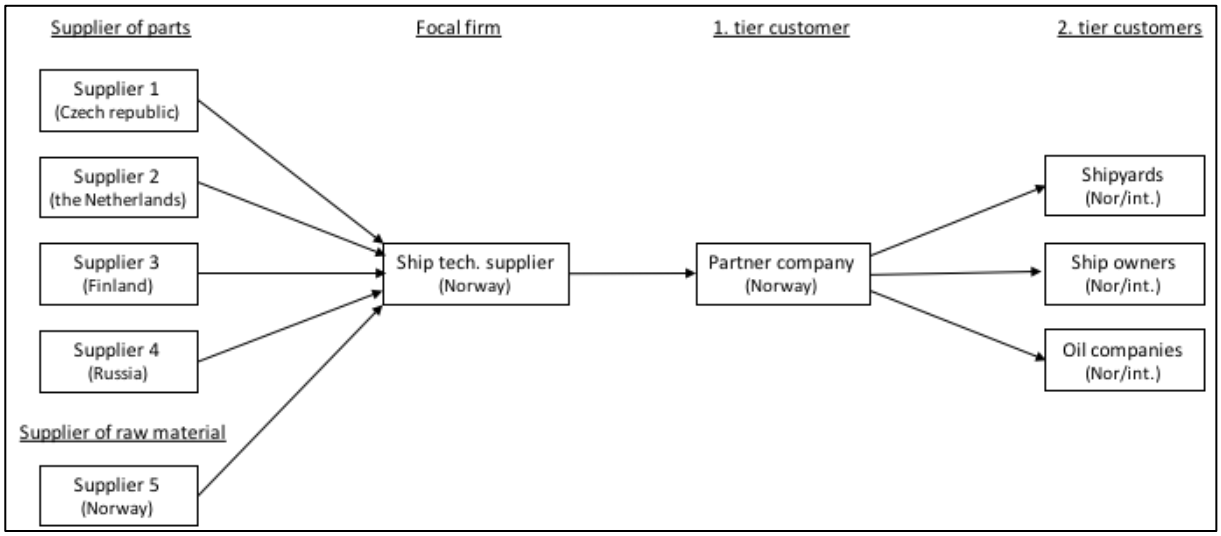
The company follows an engineer-to-order (ETO) strategy, meaning that their production is customer order-driven (Olhager, 2003). This is a natural supply chain strategy for the company, as the lead-time for their products can range between 12-24 months. The focal company has modularized their products, which makes it easier for the engineering and manufacturing departments to design and produce the parts/products. Furthermore, the modules allow the company to customize their products according to customer preferences.

The focal company operates within two product areas: Exploration & Production (EP) and Supply & Service (SS). The EP-category is mainly related to the exploration and recovery of oil and gas, while the SS-category is mainly related to anchor handling and supply. Products within the EP-category are supplied to FPSOs[1], spar buoys, installation vessels, cable layers, etc., while products within SS are supplied to towing vessels, anchor handlers, etc. The focal company operates in the offshore market, where the company is a world leading supplier of equipment. The company's customers are mainly shipyards, ship owners and oil companies (handled through a partner company). In the market for big winches to anchor handling vessels, the focal company has a market share of 95% worldwide. In addition, in the market for mooring equipment for rigs, the focal company has a market share of 65-66% of the world market. According to Figure 1, suppliers can be divided into two main groups: (1) suppliers of raw material and (2) suppliers of parts. Some of these suppliers are Norwegian, while others are from Russia, Czech Republic, Finland, and the Netherlands. Outsourced products include secondary winches, frames, spooling gear, and guide rollers. The suppliers have sub-suppliers, but these are not considered in this supply network.

In 2007-2010, the market was in a period of recovery. For the focal company, this meant they had many incoming orders from customers. To handle all incoming orders and to maintain their market share, the focal company decided to outsource parts of their production. The decision to outsource production to external vendors in Norway and Eastern Europe allowed the company to significantly increase their capacity without increasing their in-house workforce. As the company wanted the capacity to handle both times of recovery and recession, outsourcing parts of the production became a natural strategic choice in this period. The focal company faces a completely different situation today; the market is in a deep recession, the order-income is low, and the company has less work. Therefore, the focal company has decided to start backsourcing products from external vendors to increase in-house production.

[1] Floating Production, Storage and Offloading (FPSO) is a floating platform used in offshore petroleum activities to process and store petroleum during production on an oil field.

Figure 1. Simplified supply network in the backsourcing case study



5. Case analysis and discussion

In this section, we try to answer the first research question: "How do companies conduct the backsourcing process?" As there is no available theoretical framework to follow for the backsourcing process, this analysis is built on Lacity and Willcocks's (2000a) model of IT outsourcing. Although outsourcing and backsourcing are two different processes, our analysis is presented according to attributes such as phases, activities, and objectives. This approach is adapted from Lacity and Willcocks (2000a).

This paper is based on interviews with employees representing three different levels of the company; from the owner and CEO to managers and supervisors, representing top-level management, middle-level management, and low-level management. All respondents have, at some point, been involved in the backsourcing process. Based on the interviews, four phases for backsourcing were identified; each composed of different objectives and activities. Below, the overall objective and activities for each of the different phases are discussed. Tables 3-6 displays a mixture of summary phrases and direct quotes from the interviews related to the four phases for backsourcing (Miles and Huberman, 1994). Activities are presented based on how frequently they were mentioned by the respondents.

5.1 Phase 1 – The initial phase

Phase 1 was the initial phase of the backsourcing process. The three main activities in this phase were: (1) to create an overall plan for the capacity utilization in the company, (2) to coordinate and delegate orders, (3) and to decide whether to continue to outsource or backsource part/products. This phase created the foundation for further considerations and analysis regarding backsourcing.

According to Table 3, the management developed a long-term plan for the company based on existing and anticipated incoming orders for several years ahead. To balance the company's orders, the sales department tried to coordinate and distribute the customer orders to even out the load in the different departments. The outcome of these activities indicated whether there was any foundation for backsourcing products from external vendors based on drivers such as free capacity, changes in demand, or other drivers.

Table 3. Initial phase in the backsourcing process

Phase	Activities	Objective(s)
Phase1	*Create an overall plan* – The managers develop an overall plan for long-term capacity utilization based on existing and expected orders in the future. This plan may extend for several years ahead. (manager project department, manager production department)	Initial sourcing decision: outsourcing or backsourcing?
	Coordinate and delegate orders – The sales department coordinates the incoming orders with regards to delivery times so that the load in all departments are evenly distributed. (manager project department)	
	Decide whether to outsource or backsource – Based on the long-term plan, the management decides whether there is room for backsourcing or if they have to proceed with the outsourcing. (manager project department, manager production department)	

5.2 Phase 2 – The scoping phase

When the company decided to backsource based on the findings in Phase 1, the management proceeded with an assessment of potential products to be backsourced. The major activities during this phase included: (1) identifying potential products for backsourcing, (2) conducting a product evaluation-meeting, and (3) deciding what product(s) to backsource and terminating the contract with the external supplier. Table 4 displays information from interviews with representatives for the focal company regarding Phase 2 of the backsourcing process. The objective in this phase was to decide what products should be backsourced and terminate the contract with external supplier(s). This decision depends on three activities as described below.

Table 4. Scoping phase in the backsourcing process

Phase	Activities	Objective(s)
Phase 2	*Identify potential products for backsourcing* – If the departments have free capacity, the management start to identify potential products to backsource. Cost analysis are carried out. (CEO, supervisor production)	Decide what products should be backsourced and terminate the contract with supplier(s)
	Product evaluation-meeting – The managers from the project-, construction-, production-, and welding-department holds an evaluation meeting. Product drawings are carefully evaluated in this meeting with the purpose of identifying products or production methods that can be improved (thus reducing costs to an acceptable level). The products are critically evaluated in terms of their machine-park and existing equipment/machines. (CEO, supervisor production)	
	Decide what product(s) to be backsourced & contract termination – Based on the findings in this process, the management decides what product(s) should be backsourced and the contract with the external supplier is terminated. (manager project department)	

When the focal company considered backsourcing, they started by calculating costs related to the product. This analysis gave an indication of what the costs of producing the product in-house should be for the backsourcing to be a profitable choice. Based on the cost analysis, managers from the project-, construction-, production-, and welding-department arranged a product evaluation meeting where they evaluated the potential product(s) in terms of design and production method to reduce costs equivalent to the external supplier's price. This involved investment in new equipment or re-designing existing machines to fit the new product. According to the CEO, "*... the hourly rate for hand welding in the Czech Republic is much lower than the hourly rate in Norway. To match this price, we have to have robot welding.*"

Based on the cost analysis and evaluation-meeting, the management decided which product(s) should be backsourced to their production site and terminated the contract with the external supplier(s). This decision depended on product-specific drivers such as little development of

the outsourced products, high freight costs, or made in-effect. The decision also depended on both external and internal drivers, as well as different the weighting of these drivers.

5.3 Phase 3 – The re-integration phase

After the decision to backsource, there were several activities that had to be performed to prepare both the employees and the production site for the new product. This included the following activities: (1) gathering a team responsible for the re-integration of the product, (2) developing a plan for re-integrating the product, (3) re-building knowledge related to the product and preparing employees and the production site for the backsourced product, and (4) starting production of the backsourced product. Table 5 displays information from interviews with representatives of the focal company regarding Phase 3 of the backsourcing process.

Table 5. Re-integration phase in the backsourcing process

Phase	Activities	Objective(s)
Phase 3	*Establish a team responsible for the backsourced product* - When the decision is made, the management engages a team of selected employees that can optimize the process of backsourcing and re-integrating the product. (manager project department)	Establish effective production
	Develop a plan for re-integrating the product - The team conducts a planning meeting to create a plan for re-integrating the product, and, if necessary, re-design the product or machines to fit in their machine-park. Sometimes the new product requires investment in new machines. (supervisor production, manager project department)	
	Re-build knowledge and prepare the production site - If the backsourced product has been outsourced for up to 15-20 years, it is possible that valuable knowledge regarding the product is forgotten or gone [retired]. To cover this knowledge-gap, the team often include employees who have participated in the production of this product previously in the planning-meeting. If the knowledge is gone, the team starts to re-build the knowledge. (supervisor production, manager project department)	
	Start production – The backsourced product is produced in-house again. (supervisor production)	

A team was established and engaged in the re-integration process of the product. The team consisted of selected employees from the manufacturing-, engineering-, and procurement-department. The team was responsible for developing a plan to re-integrate the product and to optimize the re-integration process. Employees with knowledge and ability to optimize and adapt to new products were a scarce resource. The team was, therefore, carefully chosen based on the employees' capabilities, as illustrated in the quote below. According to a manager in the project department: *"People that have the ability to look at things and improve them are a limited resource. Not everyone in a workshop has that ability. Therefore, there is a limit to how many different products can be backsourced at the same time."*

The team held one or several meetings to create a plan for the re-integration of a product. Usually the meetings included a project manager, a couple of designers from the engineering department, supervisors from the manufacturing department, and welding engineers. During the meeting, the team critically evaluated the original design of the product and considered how they could adapt the product to their production site and machines. Sometimes the new product required investment in new machines or a re-design of the product to fit their existing machines. An important task when backsourcing products was to re-integrate knowledge and this was a complex and challenging process (Nujen et al., 2015). It was important that the team identified and understood what types of knowledge needed to be re-integrated into the company. A platform for in-house organizational knowledge had to be developed. However, when the product had been outsourced for up to two decades, valuable knowledge regarding the product

was forgotten or employees with explicit knowledge related to the product had retired. The team tried to, if possible, involve employees who had participated in the production of the product previously to close this knowledge-gap. If the knowledge was gone, the company had to re-build the knowledge by following the same principles as when they developed new products.

Another important task in the backsourcing process was to prepare the production site. This preparation was a result of the planning-meeting(s). The preparation involved re-building existing machines to fit the product, or integrating new machines. The preparation also included clearing large enough areas for the backsourced product, as some products required large surfaces due to the product-size. Also, employees in the workshop had to prepare and train for the new tasks.

The final step in this phase was to start producing the backsourced product in-house. After all the preparation had been done, the product was brought back home and put into production. The goal was to establish effective production of the backsourced product.

5.4 Phase 4 – The evaluation phase

In this phase, the objective was to determine and plan the fate of the backsourced product. The management decided whether the production process was sufficient to continue production in-house or if they were better off outsourcing the product. Based on the interviews two activities were apparent in this phase: (1) conducting a project evaluation in terms of what went well and not so well with the product, and (2) determining whether the product should be kept in-house or outsourced. Table 6 displays information from interviews with representatives of the focal company regarding phase 4 of the backsourcing process.

Table 6. Evaluation phase in the backsourcing process

Phase	Activities	Objective(s)
Phase 4	*Project evaluation-meeting* - After the backsourced product is produced at their site for the first time, the managers representing construction, production, project and procurement meet for a "project evaluation". At this meeting, they evaluate the product and the production process in terms of what went well and badly. Then they plan how they can further improve the product and production process. (manager production department, manager project department)	Determine and plan the fate of the backsourced product.
	Decide whether to keep the product in-house or outsource - A decision is made regarding whether the company want to keep the backsourced product or outsource the product again. (manager project department, supervisor production)	

The objective in this phase was to determine and plan the fate of the backsourced product. After the backsourced product had been produced in-house for the first time, representatives from the engineering-, manufacturing-, project-, and procurement department met for a project evaluation. The purpose of this meeting was to evaluate the backsourced product in terms of what went well and not so well, and to consider how they could further improve the product and the production process.

Based on the project evaluation, a decision was made regarding whether the product should be kept in-house or outsourced. This was an assessment case for the project manager. Some backsourced products were successfully re-integrated into the company, while others were not. According to a manager in the project department: *"Some of the products that were outsourced, were outsourced because they were not suitable for us. When you bring such products home, they are still not suitable. This requires some restructuring, and some products are successfully re-integrated and others are not."* For instance, the company tried to backsource smaller frames from an external supplier in Norway. The focal company spent a lot of time trying to re-integrate

the product, but due to the size of the product, they had to outsource the product again as it required substantial investment in a new welding hall and equipment/machines. The costs required to integrate the product were too high and the management saw no other option than to outsource the product again. Other backsourced products had been a great success for the company. For instance, the backsourcing of spooling gear from the Czech supplier, provided the opportunity to improve the design of the product and has been a success.

5.5 Analytical framework

It was a clear expectation from the researchers that the backsourcing process would be a somewhat reversed model of the outsourcing process identified by Lacity and Willcocks (2000). The backsourcing process, as depicted in Table 7, is however, not a reverse model of the outsourcing process. Throughout the analysis, we can see that the two models have some similarities, especially in the two initial phases and the final phase. Although both processes focus on establishing operational performance, the difference between backsourcing and outsourcing becomes clearly evident in the third phase. The objective in the backsourcing process is to prepare the production site and employees for the re-integration of the product by re-building knowledge and adapting the machines to the backsourced product. The outsourcing process, in comparison, mainly focuses on establishing a relationship with the external vendor to establish and secure operational performance. It is worth highlighting that the backsourcing process is dynamic and depends on the context.

Table 7. The focal company's backsourcing process

	Phase 1 – The initial phase	**Phase 2 – The scoping phase**	**Phase 3 – The re-integration phase**	**Phase 4 – The evaluation phase**
Activities	• Create an overall plan • Coordinate and delegate orders • Decide whether to outsource or insource	• Identify potential products for backsourcing • Product evaluation meeting • Decide what product(s) to be backsourced and terminate contract	• Establish a team responsible for the backsourced product • Develop a plan for re-integrating the product • Re-build knowledge and prepare the production site for the product(s) • Start production	• Project evaluation meeting • Decide whether to keep the product in-house or outsource
Objective	Initial sourcing decision – outsource or backsource?	Decide what product(s) should be backsourced and terminate contract with supplier(s)	Establish effective production	Determine and plan the fate of the backsourced product

Both phase 1 and 2 of the backsourcing process have some similarities with the outsourcing process identified by Lacity and Willcocks (2000a). The overall objectives in these phases are similar in both backsourcing and outsourcing as both models focus on identifying potential products or activities for outsourcing/backsourcing. In phase 1 of the backsourcing process, an overall decision is made regarding whether to outsource or backsource based on overall drivers such as free capacity, investment in new equipment and robotics, changes in demand, higher than expected costs, and/or innovation. These drivers were identified as high impact-drivers and were consistent with previous research regarding drivers for backsourcing/reshoring (Fratocchi et al., 2016, Wiesmann et al., 2017, Veltri et al., 2008). The two models also include opposite activities, for instance phase 2 of the backsourcing process involves a contract termination, while in the outsourcing process involves a contract signing.

Phase 3 is especially different from the outsourcing process – while the activities in the backsourcing process include a contract termination and a re-integration of activities, the

outsourcing process involves signing a contract and establishing operational performance between the focal company and the supplier. The final phase, phase 4, is again quite similar to the outsourcing process, as both models involve determining whether to continue with the outsourcing/in-sourcing.

While some of the activities and objectives in the outsourcing and backsourcing process are similar and opposite, the backsourcing process represents a new contribution to theory. The model proposed in this study can be understood as an extension, or a possible outcome, of the final phase in the outsourcing model proposed by Lacity and Willcocks (2000a), where the focal company must decide whether to continue outsourcing or terminate the contract with the vendor and backsource the products.

5.6 Internal challenges related to backsourcing

Although most of the focal company's backsourced products have been successfully re-integrated into the company, they have experienced some difficulties with the re-integration of products. Therefore, the second research question, we try to answer is "What are the internal challenges concerning the backsourcing process?"

Limitation in capacity. In this case, limitations in capacity refers to production capacity and the number of employees. Since the demand in the offshore-market fluctuates, the focal company did not want their fixed capacity to be greater than demand during a recession. This limitation caused several challenges during the backsourcing process. First, the backsourcing process was a demanding and required available in-house capacity. Re-integrating the products did not only require available capacity in the manufacturing department, but also available capacity in the engineering- and procurement department. Second, backsourcing the products was a time-consuming and complex process. Not everyone in the workshop had the ability to adapt to the new products and improve these. The success of the backsourcing therefore relied on a selected team of employees with the right capabilities to handle the backsourced products. However, such employees were a scarce resource, which in turn limited the number of products that could be backsourced at the same time. An advantage for the focal company was their modularization of products. As a result of this, most of the parts and components were familiar to the company, which in turn made it easier to re-integrate products and less time-consuming for the different departments.

Knowledge re-integration was a challenge for the focal company's backsourcing in two ways. First, since products had been outsourced for several years, knowledge regarding the products had to be re-built as employees with explicit knowledge regarding the products had retired/left the company, or the knowledge was forgotten. Second, since both engineering and manufacturing of the products had been outsourced, the company experienced a challenge in learning how to construct products in a way that was well-adapted to their existing machines and production methods. The interviews revealed that the company had to develop new knowledge regarding both the engineering and manufacturing of the products. These observations are in line with findings by Nujen et al. (2015), who argue that the success of re-integration depends on the firm's ability to identify and understand what types of knowledge needed to be re-integrated. The procurement department, in addition, had many new parts to purchase, which was a time-consuming process that required available in-house capacity. To solve these issues, the company engaged a team of carefully selected employees that had the knowledge and ability to optimize and adapt to the new products.

Adapting the backsourced products to the production site was another challenge. Some products were outsourced to external suppliers because they were not suitable for the focal company (Hätönen and Eriksson, 2009). This could be products that occupied large surfaces, were

difficult to mechanize, products that required a high degree of manual work, products or parts that the company had not been able to produce because of knowledge and/or capabilities, or products that required significant investments. When the focal company backsourced these products, they were still not optimal for the company. It required substantial planning and evaluation to find a good solution as to how the company could adapt and re-integrate the products.

6. Conclusion and implications

In sum, this paper contributes to the body of knowledge about backsourcing through developing a better understanding of the drivers, processes and challenges that managers are forced to address when considering backsourcing. The main contribution from this research is the identification of four phases of the backsourcing process; the initial phase, the scoping phase, the re-integration phase, and the evaluation phase. Each of the phases consists of different activities and objectives. In addition, three main challenges were identified, namely limitations in capacity, re-building knowledge, and adapting the backsourced products to the production site.

We applied a qualitative method in the form of a single case study. Generalizations that can be drawn from the study are limited. However, the purpose of this study was not to generalize the findings to a larger population, but rather to develop a framework that might be applicable to other companies or situations. Moreover, we followed an inductive qualitative approach, where observations and data from the interviews laid the foundation for the backsourcing model proposed and the internal challenges identified. Although the researchers have tried to clarify any ambiguities during the interviews, there is a possibility that some of the answers from the respondents have been misinterpreted. As a measure to reduce the risk of misinterpretations, several of the respondents were asked similar questions that, in most cases, confirmed the information.

Another limitation of the study is that interviews did not include a supplier company. Thus, the suppliers' opinion and experience regarding the focal company's backsourcing was not taken into consideration. This is unfortunate considering that 1. and 2. tier customers were included in the sample. However, the choice was consciously made as it was a clear expectation that interviews with suppliers would contain biases when measuring the focal company's competitive advantage. Nonetheless, it would have been interesting to hear how the suppliers experienced the process of backsourcing and whether they experienced any challenges related to the focal company's decision to backsource.

The context of this study is highly relevant due to the present situation in the offshore market. Companies operating in the offshore market are currently going through a critical phase, and many companies are considering new markets to enter. Changes in demand and available in-house capacity, among other factors, make backsourcing an attractive strategic choice for companies to increase their in-house production. However, backsourcing is a demanding and time-consuming process that requires substantial planning. The findings of this study highlight many important factors that managers are faced with when embarking on a backsourcing strategy. First, the identification of strategic drivers and processes in the manufacturing industry could help managers to more efficiently address decisions and dilemmas related to the backsourcing process. It is no doubt that the process of backsourcing is demanding, and the analytical framework was created as a tool that could help managers to better understand and plan the process of backsourcing, and possibly avoid costly mistakes. Second, it is recommended that knowledge be kept in-house. This is important when operating in knowledge-intensive industries such as the maritime industry. If knowledge is outsourced,

companies will lose valuable knowledge that, in turn, will reduce a company's competitiveness and innovative power. Third, it is recommended that managers pay attention to Phase 3 of the backsourcing process as all the identified internal challenges occurred during this phase.

The theoretical contributions from this paper and suggestions for future research are several. First, a literature review of drivers for different sourcing arrangements has been presented. The aim is to build a conceptual framework that can help identify motives and circumstances driving companies' behaviour. Second, the backsourcing model proposed in this study is a new contribution to theory. The model can be seen as an extension, or a possible outcome, of the finale phase in the outsourcing process. However, as this is a single case study, the model's generalizability is limited. A recommendation for future research is therefore to test the proposed stepwise model for how companies can conduct their backsourcing process on other manufacturing companies or industries. For example, it would be interesting to investigate to what extent the backsourcing model sheds light on differences in backsourcing services versus manufacturing business functions. Third, the knowledge re-integration process is built on previous studies and the findings in this study are consistent with existing theory. In addition, limitations in capacity and adapting the backsourced product to the production site were identified as internal challenges when backsourcing production, which is a new contribution to theory. However, these challenges may be case-specific challenges that might not occur in other cases. A recommendation for future research is therefore to further examine the internal challenges related to the backsourcing process and include several companies, preferably from different industries, as it would be illuminating to see if challenges related to the backsourcing process differ according to the type of industry.

7. References

ANCARANI, A., DI MAURO, C., FRATOCCHI, L., ORZES, G. & SARTOR, M. 2015. Prior to reshoring: A duration analysis of foreign manufacturing ventures. *International Journal of Production Economics,* 169**,** 141-155.

BARTHÉLEMY, J. 2003. The Seven Deadly Sins of Outsourcing. *Academy of Management Executive,* 17**,** 87-100.

BHAGWATWAR, A., HACKNEY, R. & DESOUZA, K. C. 2011. Considerations for information systems "backsourcing": A framework for knowledge re-integration. *Information Systems Management,* 28**,** 165-173.

DUNNING, J. H. 1993. *Multinational Enterprises and the Global Economy,* Harlow, Addison-Wesley.

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

EJODAME, K. & OSHRI, I. 2018. Understanding knowledge re-integration in backsourcing. *Journal of Information Technology,* 33**,** 136-150.

ELLRAM, L. & BILLINGTON, C. 2001. Purchasing leverage considerations in the outsourcing decision. *European Journal of Purchasing & Supply Management,* 7**,** 15-27.

FLYVBJERG, B. 2006. Five misunderstandings about case-study research. *Qualitative Inquiry,* 12**,** 219-245.

FOERSTL, K., KIRCHOFF, J. F. & BALS, L. 2016. Reshoring and insourcing: drivers and future research directions. *International Journal of Physical Distribution & Logistics Management,* 46**,** 492-515.

FRATOCCHI, L., ANCARANI, A., BARBIERI, P., DI MAURO, C., NASSIMBENI, G., SARTOR, M., VIGNOLI, M. & ZANONI, A. 2016. Motivations of manufacturing reshoring: an interpretative framework. *International Journal of Physical Distribution & Logistics Management,* 46**,** 98-127.

HIRSCHHEIM, R. & LACITY, M. C. 2000. The Myths and Realities of Information Technology Insourcing. *Communications of the ACM,* 43**,** 99-107.

HÄTÖNEN, J. & ERIKSSON, T. 2009. 30+ years of research and practice of outsourcing - Exploring the past and anticipating the future. *Journal of International Management,* 15**,** 142-155.

JACOBSEN, D. I. 2005. *Hvordan gjennomføre undersøkelser? Innføring i samfunnsvitenskapelig metode,* Kristiansand, Høyskoleforlaget.

JENSEN, P. D. Ø. & PEDERSEN, T. 2011. The Economic Geography of Offshoring: The Fit between Activities and Local Context. *Journal of Management Studies,* 48**,** 352-372.

KERN, T. & WILLCOCKS, L. P. 2002. Exploring relationship in information technology outsourcing: the interaction approach. *European Journal of Information Systems,* 11**,** 3-19.

KINKEL, S., LAY, G. & MALOCA, S. 2007. Development, motives and employment effects of manufacturing offshoring of German SMEs. *International Journal of Entrepreneurship and Small Business,* 4**,** 256-276.

KINKEL, S. & MALOCA, S. 2009. Drivers and antecedents of manufacturing offshoring and backshoring—A German perspective. *Journal of Purchasing & Supply Management,* 15**,** 154-165.

KOTLARSKY, J. & BOGNAR, L. 2012. Understanding the process of backsourcing: two cases of process and product backsourcing in Europe. *Journal of Information Technology Teaching Cases,* 2**,** 79-86.

LACITY, M. C. & WILLCOCKS, L. P. 2000a. Relationships in IT Outsourcing: A Stakeholder Perspective. *In:* ZMUD, R. W. (ed.) *Framing the Domains of IT Management: Projecting the Future Through the Past.* Cincinnati, OH: Pinnaflex Educational Resources.

LACITY, M. C. & WILLCOCKS, L. P. 2000b. Survey of IT Outsourcing Experiences in US and UK Organizations. *Journal of Global Information Management,* 8**,** 5-23.

LACITY, M. C., WILLCOCKS, L. P. & ROTTMAN, J. W. 2008. Global outsourcing of back office servies: Lessons, trends, and enduring challenges. *Strategic Outsourcing An International Journal,* 1**,** 13-34.

MILES, M. B. & HUBERMAN, A. M. 1994. *Qualitative data analysis: an expanded sourcebook,* Thousand Oaks, CA, Sage Publications.

NAGPAL, P. 2015. Backsourcing: A review and theoretical motivated view. *Journal of Management Information and Decision Science,* 18**,** 53-58.

NUJEN, B. B. & DAMM, R. 2016. The Need for Knowledge Management When Backsourcing is Embraced. *In:* NÄÄS, I., VENDRAMETTO, O., MENDES REIS, J., FRANCO GONÇALVES, R., TERRA SILVA, M., VON CIEMINSKI, G. & KIRITSIS, D. (eds.) *Advances in Production Management Systems. Initiatives for a Sustainable World.*: Springer, Cham.

NUJEN, B. B., HALSE, L. L. & SOLLI-SÆTHER, H. 2015. Backsourcing and Knowledge Re-integration: A Case Study. *In:* UMEDA, S., NAKANO, M., MIZUYAMA, H., HIBINO, H., KIRITSIS, K. & VON CIEMINSKI, G. (eds.) *Advances in Production Management Systems: Innovative Production Management Towards Sustainable Growth.* Switzerland: Springer International Publishing.

OLHAGER, J. 2003. Strategic positioning of the order penetration point. *International Journal of Production Economics,* 85**,** 319-329.

OSHRI, I., KOTLARSKY, J. & WILLCOCKS, L. P. 2011. *The handbook of global outsourcing and offshoring,* London, Palgrave Mcmillan.

PATTON, M. Q. 2002. *Qualitative research and evaluation methods,* Thousand Oaks, CA, Sage Publications.

SCHNIEDERJANS, M. J., SCHNIEDERJANS, A. M. & SCHNIEDERJANS, D. G. 2015. *Outsourcing and insourcing in an international context*, Routledge.

SOLLI-SÆTHER, H. & GOTTSCHALK, P. 2007. Rapport fra Outsourcingsundersøkelsen 2007. Oslo: BI Norwegian Business School.

SOLLI-SÆTHER, H. & GOTTSCHALK, P. 2015. Stages-of-growth in outsourcing, offshoring and backsourcing: Back to the future? *Journal of Computer Information Systems,* 55**,** 88-94.

SURI, H. 2011. Purposeful sampling in qualitative research synthesis. *Qualitative Research Journal,* 11**,** 63-75.

VELTRI, N. F., SAUNDERS, C. S. & KAVAN, C. B. 2008. Information systems backsourcing: correcting problems and responding to opportunities. *California Management Review,* 51**,** 50-76.

VENKATRAMAN, N. V. 2004. Offshoring without guilt. *MIT Sloan Management Review,* 45**,** 14-16.

WIESMANN, B., SNOEI, J. R., HILLETOFTH, P. & ERIKSSON, D. 2017. Drivers and barriers to reshoring: a literature review on offshoring in reverse. *European Business Review,* 29**,** 15-42.

YIN, R. K. 2009. *Case study research: Design and methods,* Thousand Oaks, CA, Sage Publications.

Appendix A: Interview guide

General questions

1. Can you give a brief presentation of yourself and your position?
2. Can you describe the company's vision, goal and size?

Drivers for outsourcing and backsourcing

3. Can you tell me about the circumstances related to the company's outsourcing?
4. Can you tell me about the circumstances related to the company's backsourcing?
5. What was the background and drivers for backsourcing?
6. What products have been backsourced?

The backsourcing process

7. Can you describe the process of moving production back in-house?
8. Can you mention some critical success factors related to the process of moving production back in-house?

Internal challenges related to the backsourcing

9. Were there any internal challenges that occurred during the backsourcing process?
10. How did you re-integrate or re-build knowledge related to the backsourced products?

Backsourcing and the company's competitive advantage

11. What is, according to your experience, the company's competitive advantage(s)?
12. According to your experience, to what extent will the company's decision to backsource parts of their production affect their competitive advantage and position in the market?

Closing questions

13. Is there anything else you want to add that we haven't been through already?