

# Manufacturing relocation through offshoring and backshoring: the case of Sweden

Offshoring and  
backshoring

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## Abstract

**Purpose** – The purpose of this paper is to present recent empirical results concerning offshoring and backshoring of manufacturing from and to Sweden, to increase the understanding of manufacturing relocation in an international context. In particular, extent, geographies, type of production, drivers, and benefits of moving manufacturing in both directions are investigated.

**Design/methodology/approach** – The study is based on survey data from 373 manufacturing plants. The same set of questions is used for both offshoring and backshoring between 2010 and 2015, which allows similarities and differences in decision-making and results between the two relocation directions to be identified.

**Findings** – There are many significant differences between offshoring and backshoring projects. Labour cost is the dominating factor in offshoring, as driver and benefit, while backshoring is related to many drivers and benefits, such as quality, lead-time, flexibility, access to skills and knowledge, access to technology, and proximity to R&D. This is also reflected in the type of production that is relocated; labour-intensive production is offshored and complex production is backshored.

**Research limitations/implications** – Plants that have both offshored and backshored think and act differently than plants that have only offshored or backshored, which is why it is important to distinguish between these plant types in the context of manufacturing relocations.

**Practical implications** – The experience of Swedish manufacturing plants reported here can be used as a point of reference for internal manufacturing operations.

**Originality/value** – The survey design allows a unique comparison between offshoring and backshoring activity. Since Swedish firms in general have been quite active in rearranging their manufacturing footprint and have experience from movements in both directions, it is an appropriate geographical area to study in this context.

**Keywords** Operations management, Reshoring, Global manufacturing networks, Survey research, International manufacturing networks, Global operations, Rightshoring

**Paper type** Research paper

## 1. Introduction

Offshoring has been widely used during the past decades by firms in highly industrialised countries that have relocated their production to low-wage countries in e.g. Asia or Eastern Europe in order to find cost-effective manufacturing options. In general, offshoring refers to the activity of relocating value-adding activities across the national borders of the firm (Roza *et al.*, 2011). According to recent research, however, many companies have failed to accurately weigh the costs against the benefits, and have encountered difficulties with, e.g. low quality, increased inventory, long lead-times or complications with communication and coordination (Leibl *et al.*, 2011; Stanczyk *et al.*, 2017). Global sourcing has often proved to be costlier than anticipated as the hidden costs of the offshoring operation may be substantial and hard to estimate (Platts and Song, 2010; Larsen *et al.*, 2013). In addition, the nature of manufacturing is evolving and there are ongoing structural shifts in low-cost regions that are



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shaping the global manufacturing environment and forcing companies to handle a more complex set of factors when considering their manufacturing location decision (Strom and Levy, 2013). These circumstances have led some firms to reconsider their previous offshoring decision and bring manufacturing back to the home region, a phenomenon referred to as backshoring (Canham and Hamilton, 2013; Kinkel, 2014; Stentoft *et al.*, 2016). While Wiesmann *et al.* (2017) found that the most commonly used term for the movement of once offshored manufacturing activities back to its previous location is reshoring, Albertoni *et al.* (2017) refer to reshoring as a generic change of location (could be further offshoring). In this research, we use the term backshoring to describe the movement of production activities all the way back to the country of origin.

The phenomenon of backshoring is not only of interest for practitioners, but has received increasing attention from policy makers in developed countries in the hope that it might help to create new job opportunities and restore the manufacturing industry in the home countries (Stentoft *et al.*, 2016). Historically, manufacturing has been an important driver of economic growth. In advanced economies, however, manufacturing's share of employment has weakened as a consequence of productivity improvements and global competition that has pushed firms to offshore their operations (Manyika *et al.*, 2012). One such country is Sweden, where manufacturing has played an important role for economic growth and social welfare because of a historically strong trade balance. However, as a high-wage country, having a small home market, Sweden has suffered from the offshoring trend and is predicted to continue to lose manufacturing jobs to low-cost countries unless global competitiveness in manufacturing turns in Sweden's favour (Alsén *et al.*, 2013). Since Swedish firms in general have been quite active in rearranging their manufacturing footprint and have experience from both offshoring and backshoring, it is an appropriate geographical area to study in this context.

Although there is much current interest in manufacturing relocation in general and the phenomenon of backshoring in particular, a complete picture of the extent and drivers of the manufacturing location decision is still lacking (Fratocchi *et al.*, 2014). Empirical evidence is starting to emerge but more research is needed on the drivers, effects, and likely evolution of the phenomenon (Brennan *et al.*, 2015). Data for Sweden in particular are still scarce and the extent of offshoring vs backshoring activities has not yet been investigated, nor have the geographical aspects been investigated, i.e. to and from which regions manufacturing has been relocated. Hence, the first research question is:

*RQ1.* How is Swedish manufacturing affected by recent offshoring and backshoring?

Previous studies indicate that there are differences in how firms manage offshoring and backshoring in terms of drivers of the relocation decision, the type of production that is moved, and the expected outcomes (see, e.g. Canham and Hamilton, 2013; Kinkel and Zanker, 2013). Only Canham and Hamilton (2013) have performed a statistical comparison of the two relocation directions by analysing how the type of manufacturing system, capital intensity, export intensity, and R&D intensity affect offshoring and backshoring propensities. They found that manufacturing system type and R&D intensity significantly affected offshoring decisions, but found no significant relationship for backshoring. However, we have not been able to find studies that statistically compare the two relocation directions using a broader set of factors. Our aim is therefore to statistically analyse and compare the type of production, drivers, and benefits associated with offshoring and backshoring projects to contribute to the general understanding of manufacturing relocation. Hence, our second research question is:

*RQ2.* How are offshoring and backshoring projects managed and what are the similarities and differences between the two directions?

In order to address the research questions, we conduct a broad-scale survey of manufacturing relocation activities from and to Sweden. Because of the limited research on

backshoring, and especially its relationship with offshoring, we apply an explorative approach in order to improve the understanding of the phenomenon. We capture both offshoring and backshoring projects with the same set of questions and thereby provide both empirical evidence of the extent, geography, type of production, drivers, and benefits and an opportunity to perform a statistical comparative analysis between the two types of manufacturing relocation.

We first discuss the related literature. We then present the research design and methodology. The main section is concerned with the results from the survey. Finally, we provide implications for managers and researchers and discuss limitations and further research.

## 2. Related literature

Evolving supplier networks is one of the main trends in networked supply chain structures, as international networks are continuously contracting and expanding (Hameri and Hintsa, 2009). This has led to larger and highly specialised manufacturing networks around the globe. In this context, it is a challenging but important task to evaluate the strategic positions of plants in a manufacturing network since the geographical location of plants can have a significant impact on the profitability of a firm in the long term (Vos, 1991). The manufacturing location decision is part of the manufacturing firms' business strategy and offshoring as well as backshoring of operations are two strategic options for manufacturing firms (Fratocchi *et al.*, 2014).

A number of theories have been used, from both economics and international business literature, to explain why firms relocate their manufacturing. Two of the most common theories to explain offshoring decisions are the transaction cost economics (TCE) and the resource-based view (RBV), according to a literature review by Mihalache and Mihalache (2016). Both are concerned with the make-or-buy decision, but while TCE focusses on the cost perspective, RBV deals with the search for a competitive advantage (McIvor, 2013; Mihalache and Mihalache, 2016). Internalisation theory is another theory that has been widely used to explain the foreign activities of multinational enterprises (MNEs). It is linked both to TCE and to RBV as it focusses on the conditions under which the firm should perform the activity internally and which conditions call for outsourcing of production. It argues that every stage in the manufacturing process competes for limited resources in the form of knowledge or other intermediate products, and the MNE chooses to internalise activities when the market fails to provide the resources required or when it is economically more beneficial to perform activities internally (Rugman and Verbeke, 2008). However, these theories only provide part of the explanation for offshoring and backshoring since they focus on the ownership aspect (i.e. sourcing) rather than the location aspect (i.e. shoring). As implied by Gray *et al.* (2013), backshoring is essentially a location decision as it focusses on where the activities are performed rather than who is performing them.

The OLI framework (sometimes referred to the eclectic paradigm) has become one of the leading frameworks in international business research (Wiesmann *et al.*, 2017). It builds upon the theory of internalisation (Rugman, 2010) and other partial theories in an attempt to synthesise the essential features in international economic involvement (Dunning, 2015). The OLI framework explains international manufacturing through three determinants that need to be realised for a firm to engage in international activities: ownership advantages (O), location advantages (L) and internalisation advantages (I) (Dunning, 1980, 1998). These three types of advantages are assumed to be unevenly spread across countries, industries, or enterprises. The interaction between them changes over time and thereby alters the optimal configuration of the MNE (Dunning, 2015). Dunning (1998) further categorised the L advantages into four groups of location factors that would explain in more detail what attracts firms to different regions: resource

seeking; market seeking; efficiency seeking; and strategic asset seeking advantages. The OLI framework essentially studies foreign direct investments and is thus appropriate for explaining offshoring activity. However, it has also been used to explain backshoring as it considers a manufacturing relocation to be a consequence of changes in the advantages and conditions that determine the optimal configuration of the MNE, something that could also motivate the need to bring manufacturing back (Ellram, 2013).

### 2.1 Offshoring

Offshoring, in particular from high-cost to low-cost destinations, has been practised by industry for at least the past 50 years. In the beginning, it was primarily manufacturing or assembly operations that were moved to foreign locations in order for the firm to cut production and labour costs and align their cost structures with their global competitors (Lewin and Peeters, 2006). Even though studies have shown that it is still more common to offshore simple than advanced tasks (Jensen and Pedersen, 2012), the nature of offshoring has changed in terms of task complexity. This development can be described as a learning-by-doing process as an offshoring firm goes through a number of stages, from cost minimising motives towards innovation seeking (Maskell *et al.*, 2007). However, even though firms tend to continue offshoring with more advanced tasks they are careful not to offshore activities regarded as the core competence of the business (Lewin and Peeters, 2006). In fact, Linares-Navarro *et al.* (2014) showed that essential activities are most commonly offshored within the boundaries of the firm, while activities that are outsourced to external parties are often considered non-core. There is a relationship between the characteristics of the offshored activity and the drivers of the decision to relocate (Jensen and Pedersen, 2011), as offshoring of advanced tasks has been related to the search for skills and knowledge rather than cost savings.

It has been argued that offshoring would be dominated by large companies because of their often global networks, but research shows that SMEs are also active in relocating their activities even though their motives may be of another nature (Kinkel *et al.*, 2007; Roza *et al.*, 2011; Waehrens *et al.*, 2015). Offshoring has however other implications for SMEs than for large firms as they have less experience and less advanced organisations in terms of, e.g. standardised processes and managerial capability (Waehrens *et al.*, 2015). Offshoring of operations poses strategic challenges at the home plant, which implies a greater need to develop a strong concept of operations for the offshoring activity to be successful (Waehrens *et al.*, 2015).

Theory suggests a number of motives for offshoring, such as cost seeking, resource seeking, innovation seeking, proximity to customers and suppliers, etc. (Roza *et al.*, 2011; Ancarani *et al.*, 2015). Schmeisser (2013) concluded that there is no single theory that fully explains how and why firms' offshore value-adding activities and why there are differences in offshoring practices. Research on drivers of offshoring often takes on a multi-dimensional perspective that takes into account the interrelated trends in developed and emerging countries that affect the individual firms' location strategies. Empirical studies, however, give similar results, pointing to cost as the major driver of offshoring (Lewin and Peeters, 2006; Kinkel *et al.*, 2007; Lewin *et al.*, 2009; da Silveira, 2014; Waehrens *et al.*, 2015). From the perspective of the OLI framework, offshoring is then primarily related to efficiency-seeking location advantages. According to Kinkel and Maloca (2009), the OLI framework predicts that labour-intensive activities might be offshored while capital-intensive and skills-intensive activities may stay at home, when factor cost differences for capital are lower than for labour between countries. According to Contractor *et al.* (2010), offshoring for cost considerations will continue to dominate in the near future. However, as this strategy is easy to imitate by competitors, firms need to consider other aspects in order to remain competitive, such as innovation, flexibility and development (Lewin and Peeters, 2006; Waehrens *et al.*, 2015).

There are a number of studies on performance outcomes of offshoring, but Mihalache and Mihalache (2016) found in their literature review that the results were quite inconsistent. They found studies reporting positive, negative or no association at all between offshoring and improved performance. According to Mykhaylenko *et al.* (2015), this could be explained by the conditions and contexts around the manufacturing relocation that presumably determine the performance outcomes. They argue that many different set-ups could give the same results.

## 2.2 Backshoring vs offshoring

Offshoring of production activities has caused concern in developed countries because of fears that jobs will be lost to other regions and there have even been anti-offshoring campaigns from governments in countries like the USA, the UK and France (Khan and Lacity, 2012). Only a fraction of the jobs worldwide that potentially could be carried out at another location, however, is expected to be offshored, even in the future (Contractor *et al.*, 2010). Offshoring is largely a balancing act between obtaining potential benefits and handling the risks associated with manufacturing relocation. Such risks include wage escalation, the importance of tacit knowledge, transaction costs, supply chain disruptions, competitive threats in terms of technology spill-overs, and regulations at the foreign locations (Contractor *et al.*, 2010). In addition, the problems with offshoring, such as hidden costs, low quality, increased inventory, long lead-times or coordination issues (Platts and Song, 2010; Leibl *et al.*, 2011; Larsen *et al.*, 2013; Stanczyk *et al.*, 2017) have spurred the phenomenon of backshoring that has emerged as a counter-reaction to offshoring. This search for the optimal balance in the global manufacturing network has sometimes been referred to as rightshoring (Tate, 2014; Bals *et al.*, 2015).

Evidence of a possible backshoring trend is limited, although a number of survey studies have been conducted recently to collect empirical data as well as contrast backshoring with offshoring (Kinkel and Maloca, 2009; Kinkel, 2012; Canham and Hamilton, 2013; Dachs and Kinkel, 2013; Ellram *et al.*, 2013; Kinkel and Zanker, 2013; Tate *et al.*, 2014). A study of New Zealand firms showed that 44 per cent had offshored manufacturing since 2001, while only 7 per cent had backshored manufacturing during the same period (Canham and Hamilton, 2013). In the USA, incentives from governmental level have promoted backshoring and 40 per cent of the respondents in a US-based survey indicated that they perceive a trend that manufacturing is returning (Tate *et al.*, 2014). Dachs and Kinkel (2013) used data from the European Manufacturing Survey (EMS) from 2007 to mid-2009 for eight European countries (Austria, Croatia, Denmark, Finland, Germany, the Netherlands, Slovenia, Spain and Switzerland). They noticed a considerable difference between the number of firms that have experienced offshoring (10-22 per cent) compared to backshoring (3-7 per cent) as well as differences between countries; Germany showed the lowest backshoring level with three per cent while Finland and Denmark showed the highest level of 7 per cent (Dachs and Kinkel, 2013). The only longitudinal data that are available regarding the extent of backshoring are the studies on the German manufacturing industry with data from the recurring EMS from 2006, 2009 and 2012 (Kinkel and Maloca, 2009; Kinkel, 2012; Kinkel and Zanker, 2013). Offshoring activities have been steadily decreasing during the period of measurement, while backshoring remains at a low level of around 2-3 per cent. Currently there is one backshoring company for every fourth offshoring company. A time-series analysis of production movements shows that the backshoring activity takes place within two to five years after the offshoring activity, indicating that backshoring can serve as a correction of a prior location misjudgement (Kinkel, 2014). In addition, the firm's size, industry, home and host country characteristics as well as the strategy for relocation have all proven to have an influence on the duration of the offshore stay (Ancarani *et al.*, 2015).

In general, survey results give a concurrent picture indicating that backshoring of manufacturing increases with firm size, even though SMEs have become more active in

recent studies. The most active firms can be found in high-tech industries such as motor vehicles and transport equipment (Dachs and Kinkel, 2013). The geographical regions most commonly involved in manufacturing relocation in the German studies are Eastern Europe (the 12 new EU member states), China and the rest of Asia, of which Eastern Europe appears to be the most attractive region for both offshoring and backshoring. There is also a considerable level of backshoring from Western Europe and the USA (Kinkel and Zanker, 2013). A study by Ellram *et al.* (2013) indicated that factors influencing regional attractiveness differ between geographical regions and that the manufacturing location decision is affected by different drivers as well as the perceived risk in each region.

Drivers of manufacturing backshoring have been summarised in a content-based literature review by Stentoft *et al.* (2016). They can be categorised based on: cost, quality, time and flexibility, access to skills and knowledge, risks, market, and other factors (such as core focus, government incentives and correction of a poor offshoring decision). Evidence from previous survey studies is clear in that the main reason for offshoring is to reduce labour cost, whereas backshoring is related to a variety of drivers of which the most important are quality issues at the foreign site, flexibility, delivery speed and access to skills and knowledge (Kinkel and Maloca, 2009; Kinkel, 2012; Canham and Hamilton, 2013). In the context of the OLI framework, firms that backshore manufacturing are thus moving from considering only efficiency-seeking advantages such as labour cost, to considering more strategic asset-seeking location advantages. Firms that to a larger extent consider strategic asset-seeking advantages could be predicted to move manufacturing from the offshore location where the initial attraction was cost, to for example the home country where skills-intensive activities such as R&D are often internalised as I advantages (Dunning, 2015).

A number of case studies have been conducted with the purpose of gaining deeper insights into the motivations and reasons for offshoring and backshoring of manufacturing (Hameri and Hintsa, 2009; Martínez-Mora and Merino, 2014; Pearce, 2014; Gylling *et al.*, 2015; Ashby, 2016; Robinson and Hsieh, 2016). The common result is that they all highlight contextual factors and changes in the conditions that determine the optimal manufacturing location, such as exchange rates, relative price competitiveness between regions, transportation costs and market changes that put pressure on volume flexibility and short lead times. Backshoring is thus driven by many factors that could be considered temporary, which forces firms to be flexible and reassess the comparative costs and benefits in order to find the most profitable locations for manufacturing (Pearce, 2014; Tate *et al.*, 2014).

### 2.3 Synthesis

The review of the literature related to manufacturing relocation shows that there is an emerging understanding of backshoring in relation to offshoring. There is, however, a lack of detail concerning the relationship between offshoring and backshoring. The extant literature that has empirically investigated backshoring has used the firm as the unit of analysis. Since larger firms relocate more manufacturing or more often, the results may be skewed. Therefore, a more detailed unit of analysis such as the plant (a firm may have multiple plants) and projects (a plant may have carried out multiple relocation projects to and from the plant) would be beneficial to get a fuller view of different aspects of manufacturing relocation. While extent, geography, type of production, and drivers have been explored in previous research, results on performance outcomes of offshoring are inconsistent (Mihalache and Mihalache, 2016) and no empirical results exist on benefits from backshoring from survey studies. Consequently, we lack insights on benefits from backshoring projects and on comparisons between benefits from off- and backshoring. In addition, using projects as the unit of analysis would be appropriate for analysing benefits since it is most likely easier to relate benefits to specific projects – in each direction – than to overall manufacturing operations. Finally, the use of statistical

analyses to compare offshoring and backshoring is extremely rare; only Canham and Hamilton (2013) include a limited analysis contrasting offshoring and backshoring. These gaps are addressed in this research.

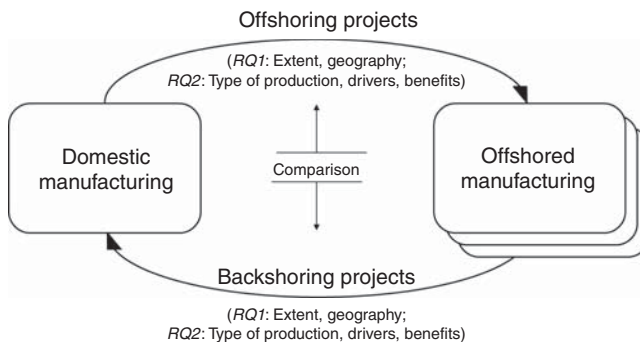
### 3. Research design and methodology

The purpose of this study is to present empirical evidence of manufacturing relocation in terms of offshoring and backshoring in Sweden, as formulated in *RQ1*. In particular, this study focusses on the extent and geographical regions involved in relocation projects to contribute to the understanding of manufacturing relocation. In addition, in line with *RQ2*, this study contributes a statistical analysis of offshoring and backshoring projects in terms of type of production, drivers, and benefits, to add new knowledge on how firms manage relocations in their quest for rightshoring. Figure 1 illustrates the research framework for this study.

The empirical data collection is based on an exploratory survey designed in accordance with general guidelines and recommendations on survey research; cf. e.g. Forza (2002). Exploratory survey research is used in the early stages of studying a phenomenon, when the objective is to become more familiar with a topic and to better understand and measure the concepts of interest (Malhotra and Grover, 1998). It is thus suitable for research on the phenomenon of backshoring, and especially the relationship (similarities and differences) between backshoring and offshoring, as this is still an under-researched area.

The questionnaire was pretested with both practitioners and researchers familiar with survey research in order to ensure high quality and accuracy of the constructs and questions. It was developed in English and then translated into Swedish. Both versions were available to the respondents. In the survey, the terms offshoring and backshoring were defined as follows: offshoring and backshoring refer to transferring manufacturing activities from one geographical location to another, either from Sweden to another country (offshoring) or bringing it back to Sweden (backshoring). The survey asks about relocation activities between 2010 and 2015. The survey questions are specified in the Appendix. Most items are perceptual with a five-point scale and the same set of questions is used for both backshoring and offshoring to be able to detect significant differences in any respect. The unit of analysis in this study is the manufacturing relocation project. This is captured in the survey by questions related to “the latest, significant manufacturing relocation project” in each respective relocation direction (offshoring and backshoring).

The survey targeted all plants in Sweden with more than 50 employees in all manufacturing industry categories (SIC code 10-33). Plants with fewer than 50 employees were assumed to report very low levels of manufacturing relocation based on previous survey results (see, e.g. Kinkel, 2012; Canham and Hamilton, 2013), and were thus excluded.



**Figure 1.**  
Research framework

Plant information and contact data were provided by Statistics Sweden (the Swedish Central Bureau of Statistics), and in total the target group included 1,637 plants, which thus constitute the population of manufacturing plants in Sweden with more than 50 employees within the industry codes 10-33. Plants with more than 100 employees were contacted by telephone before they received the survey by e-mail, while plants with under 100 employees received the survey via regular mail without any previous contact. Data were collected in September and October 2015, and after two reminders 373 usable responses were received. This is equivalent to a response rate of 22.8 per cent.

The survey respondents are production or plant managers or similar with an assumingly good knowledge of manufacturing relocation based on their experience; they have worked on average 13.8 years in production and operations management. Most respondents are production managers (47.1 per cent), followed by plant directors (30.6 per cent), global operations directors (9.4 per cent), and supply chain directors (5.6 per cent). The remaining 7.4 per cent have other positions.

Table I presents the respondent profile with respect to plant size and industry. In a few cases, the sample sub-group deviates more than 30 per cent from the expected proportion. Small plants are under-represented, which was anticipated since smaller plants are not expected to relocate manufacturing to the same extent as larger plants and therefore might refrain from responding to the survey. Plants with 101-250 employees as well as those with more than 500 employees are on the other hand over-represented. In particular, the larger plants have a response rate of 41.7 per cent, i.e. almost half the population in this size group. Two industries – electrical equipment and chemicals – are over-represented, while timber is under-represented. The overall view, however, is that the sample represents a good cross-section of the Swedish manufacturing industry.

We tested the sample for non-response bias by comparing differences between the first wave of respondents and the later returns, as suggested by, e.g. Armstrong and Overton (1977) and Lambert and Harrington (1990). This method assumes that late respondents, or respondents requiring reminders, are more like non-respondents. Only 2 out of 72 items showed significant differences between early and late respondents (significance level 0.05); these were labour costs and process quality for offshoring benefits. Non-response bias thus does not seem to pose a problem for this study.

**Table I.**  
Distribution of  
respondents with  
respect to plant  
size and industry

	Sample ( <i>n</i> = 373) (%)	Population ( <i>n</i> = 1 637) (%)	Sample/Population
<i>Number of employees at plant</i>			
Less than 100	34.2	51.5	0.66
101-250	45.7	30.5	1.50
251-500	9.5	12.2	0.78
Over 500	10.6	5.8	1.83
<i>Industry (SIC code)</i>			
Machinery and equipment (28)	17.4	13.6	1.28
Fabricated metal products (25)	10.7	12.2	0.88
Food (10)	7.5	10.3	0.73
Electrical equipment (27)	7.0	4.5	1.56
Paper (17)	6.2	5.4	1.15
Chemicals (20)	5.9	4.3	1.37
Rubber and plastics (22)	5.6	5.1	1.10
Motor vehicles (29)	5.4	6.8	0.79
Timber (16)	5.1	7.7	0.66
Computer, electronic and optical (26)	5.1	4.6	1.11
Other industries	24.1	25.5	0.95



#### 4. Results

The results section addresses the two research questions. First, we address how offshoring and backshoring have affected Swedish manufacturing, i.e. *RQ1*. This part uses descriptive statistics concerning the extent of manufacturing relocation projects in both directions during the last five years and the geographical areas that have been involved in these projects. Then, we analyse and compare how offshoring and backshoring projects have been managed in terms of the type of production that has been relocated, drivers and benefits of individual relocation projects in both directions, using statistical analyses to identify significant differences, i.e. *RQ2*.

Some respondents have reported details of both offshoring and backshoring projects, while others have relocated manufacturing in only one direction during the last five years. Furthermore, some respondents can be characterised as having stayed at home, reporting no movement of manufacturing during this period. The respondents can consequently be grouped into four categories: “bi-directional movers” (both offshoring and backshoring), “offshorers” (only offshoring), “backshorers” (only backshoring) and “stay at home”. The distribution of the 373 respondents is as follows: 51 bi-directional movers (and for which we have data for both off- and backshoring projects), 82 offshorers, 48 backshorers, and 192 that have stayed at home. During the last five years, 35.7 per cent or 133 respondents (51 bi-directional movers + 82 offshorers out of the 373 survey responses) reported that they have offshored manufacturing, while 26.5 per cent or 99 respondents (51 bi-directional movers + 48 backshorers) have moved production back to Sweden. Consequently, we have access to detailed data on 133 offshoring and 99 backshoring projects.

This categorisation and the high number of projects for each category (minimum 48) allow us to do multiple statistical comparisons. First, we can compare offshoring with backshoring for plants that have moved manufacturing in only one direction to identify similarities and differences, i.e. offshorers vs backshorers. Second, we can compare offshoring with backshoring for the bi-directional movers to analyse how similarly or dissimilarly they manage relocations in the two directions. Third, we can compare the bi-directional movers with the offshorers concerning offshoring and the bi-directional movers with the backshorers concerning backshoring to analyse if the experience of manufacturing relocation in both directions affects how offshoring and/or backshoring are managed. The respondents that have reported no manufacturing relocation are excluded from further analysis.

##### 4.1 Extent

The respondents were asked to indicate the total number of manufacturing relocation projects to and from their plant during the period from 2010 to 2015 both in the internal manufacturing network and to and from external suppliers or contract manufacturers. These movements are shown in Table II, reflecting that the ownership of the transferred production may or may not change (related to the make-buy decision, see, e.g. Linares-Navarro *et al.* (2014), Foerstl *et al.* (2016). The number of recent backshoring projects from internal plants is almost on a par with backshoring from external parties (i.e. “insourcing backshoring”), while offshoring is more extensively done to internal plants than to external parties (i.e. “outsourcing offshoring”). Plants thus move production internally to a larger extent than externally. Comparing the

	Offshoring	Backshoring	Total
Internal	316	137	453
External	193	149	342
Total	509	286	795

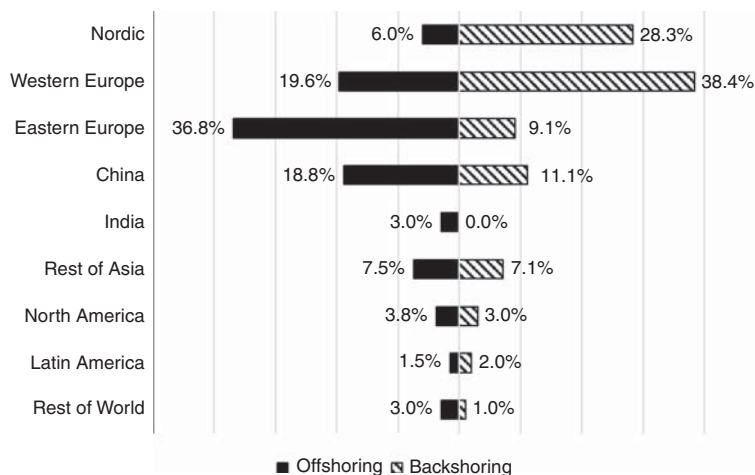
**Table II.**  
Total number of  
internal and external  
offshoring and  
backshoring projects  
the last five years

286 and 509 cases to the total number of respondents (373 plants), we find that the average Swedish plant has offshored 1.36 times and backshored 0.77 times during the last five years. Only focussing on those plants that have been active – 133 plants with offshoring and 99 with backshoring – we find that the average number of offshoring projects is 3.83 per plant and 2.89 backshoring projects per plant during the last five years. These plants thus have in general been quite active in relocating production.

In order to be able to assess the size of the manufacturing relocation we asked the respondents to estimate the impact of offshoring and backshoring in terms of the change in number of employees at the plant (plus or minus percentage change). Based on the change in employment at the plant and the plant size (in terms of the number of employees), we calculated the size effects of movements in each direction. The average size effect for both offshoring and backshoring projects is equivalent to six full-time employees. Over the last five years, the average backshoring project is thus as large as the average offshoring project and the total effect of backshoring accounts for 56.2 per cent of the total effect of offshoring during this period – both in terms of the number of employees and the number of projects (cf. Table II; 286/509). Since the average offshoring and backshoring projects are more or less of the same magnitude, the number of projects is thus indicative of the impact of backshoring and offshoring on total employment. Overall, the results thus indicate that almost twice as much manufacturing has been moving away from Sweden than has returned over the last five years.

#### 4.2 Geographical perspective on manufacturing relocations

The geographical perspective of relocations from and to a particular country provides an important contextual background for the understanding of other characteristics such as type of production, drivers and benefits. The respondents were asked to indicate the geographical region to which manufacturing was offshored or from where manufacturing was backshored, for each significant relocation project in the last five years. Figure 2 shows the percentage distribution of projects to or from each region. The main offshoring projects have been to Eastern Europe (36.8 per cent), Western Europe (19.6 per cent), and China (18.8 per cent). Particularly if the Nordic countries are included (6.0 per cent), we find that Europe dominates recent offshoring from Sweden, accounting for no less than 62.4 per cent. The same four regions top the list for backshoring, i.e. the regions from where Swedish plants have backshored manufacturing. The European dominance is even greater for



**Figure 2.**  
Distribution of  
geographical areas  
for manufacturing  
offshoring and  
backshoring projects

backshoring, accounting for no less than 75.8 per cent of the backshoring projects, while China accounts for 11.1 per cent. Together, these four regions account for 81.2 per cent of offshoring and 86.9 per cent of backshoring. Consequently, other regions such as India and “rest of Asia” account for relatively few relocations. In particular, there was not a single backshoring from India reported in this study, even though 3.0 per cent of the offshoring was done to India.

4.3 Type of production

The respondents were asked to indicate the type of production that had been relocated in terms of production volume, production complexity, labour intensity, and level of product standardisation along a five-point scale from “very low” (1) to “very high” (5) (see Appendix). Table III presents the results of a two-tailed *t*-test for equality of means.

Table III shows that production that is backshored is of a significantly higher level of complexity than what is offshored. This indicates that the home plant considers itself as better equipped to handle complexity than offshore plants. This is particularly true at the plants that have experienced both offshoring and backshoring; they clearly emphasise that complex manufacturing is backshored. The reverse holds for labour intensity, i.e. that offshoring is significantly more labour-intensive than backshoring. This correlates well with the perception that labour costs are very high in Sweden, and if the labour differential is very large, the total manufacturing cost per item can be reduced if the corresponding items are offshored to regions with low labour costs. Neither product standardisation nor production volume indicates any significant differences between backshoring and offshoring.

4.4 Drivers

There were 21 potential drivers of manufacturing relocation listed in the survey. The respondents were asked to indicate the importance of each factor in the recent relocation decision along a five-point scale from “very low” (1) to “very high” (5) (see Appendix). Table IV displays the results of a two-tailed *t*-test for equality of means. It is evident that the drivers for offshoring vs backshoring are significantly different. The only factor that is significantly more important for offshoring decisions is labour cost, while backshoring decisions are based on a multitude of factors. Quality, lead time, flexibility, access to skills and knowledge, access to technology, and proximity to R&D are all significantly more important for backshoring than for offshoring. Five of these are even significantly different at the plants that have experience from relocation in both directions, the exception being lead time. Production close to or in the market as well as time-to-market are also significantly more important in backshoring contexts when comparing the “backshorers” and the “offshorers”. However, the plants that have relocated production in both directions have a neutral view on these two factors.

Type of production	Only offshoring	Both off- and backshoring Offshoring	Backshoring	Only backshoring
Production complexity	3.10 <sup>b</sup>	3.10 <sup>a</sup>	<i>3.76<sup>a,b,c</sup></i>	3.31 <sup>c</sup>
Product standardisation	3.38	3.11	3.11	3.18
Production volume	3.10	2.92	3.16	3.11
Labour intensity	3.55 <sup>b,d</sup>	3.41 <sup>c</sup>	3.21 <sup>d</sup>	3.00 <sup>b,c</sup>

**Notes:** <sup>a</sup>Difference is significant at the 0.001 level; <sup>b</sup>difference is significant at the 0.01 level; <sup>c,d</sup>difference is significant at the 0.05 level. Mean values and level of significant differences between groups by pairwise comparisons between columns for each item; column maximum in italic

**Table III.**  
Type of relocated  
production

Drivers of off- and backshoring	Only	Both off- and backshoring		Only
	offshoring	Offshoring	Backshoring	backshoring
Quality	2.82 <sup>a,d</sup>	2.75 <sup>b,c</sup>	3.63 <sup>b,d</sup>	3.82 <sup>a,c</sup>
Lead time	2.71 <sup>a,f</sup>	2.92 <sup>e</sup>	3.33 <sup>f</sup>	3.67 <sup>a,e</sup>
Flexibility	2.75 <sup>a,d</sup>	2.76 <sup>b,c</sup>	3.54 <sup>b,d</sup>	3.60 <sup>a,c</sup>
Access to skills and knowledge	2.64 <sup>a,d</sup>	2.65 <sup>b,c</sup>	3.52 <sup>b,d</sup>	3.60 <sup>a,c</sup>
Access to technology	2.42 <sup>a,c</sup>	2.64 <sup>b,e</sup>	3.23 <sup>c,e</sup>	3.60 <sup>a,b</sup>
Proximity to R&D	2.00 <sup>a,d</sup>	1.98 <sup>b,c</sup>	3.13 <sup>b,d</sup>	3.22 <sup>a,c</sup>
Other cost	3.11	3.19	3.32	3.21
Production close to or in the market	2.58 <sup>g,i</sup>	3.06 <sup>i</sup>	2.60 <sup>h</sup>	3.13 <sup>g,h</sup>
Logistics cost	2.62 <sup>e,g</sup>	3.17 <sup>e</sup>	3.04 <sup>g</sup>	3.00
Focus on core areas	2.86	2.93	3.02	2.89
Time-to-market	2.08 <sup>e</sup>	2.11 <sup>f</sup>	2.31 <sup>g</sup>	2.86 <sup>e,f,g</sup>
Risk diversification	2.33	2.68	2.54	2.69
Access to raw materials	2.36	2.54	2.49	2.64
Avoid investments in new equip.	2.76	2.87	2.60	2.54
Changes in currency exchange rates	2.24	2.38	2.42	2.28
Shortage of qualified personnel	1.95	1.70	2.02	2.17
Labour cost	3.86 <sup>a,d</sup>	3.69 <sup>b,c</sup>	2.47 <sup>b,d</sup>	2.16 <sup>a,c</sup>
Requirement to move with customer	2.13	1.74	1.87	2.06
Country-specific conditions (e.g. subsidies, taxes, duties)	2.45	2.54 <sup>g</sup>	2.15	2.03 <sup>g</sup>
Follow industry practice	2.09	1.74	1.90	1.94
Trade barriers (e.g. customs, quotas, local content requirement)	2.30	2.37 <sup>g</sup>	2.08	1.87 <sup>g</sup>

**Table IV.**  
Drivers of off- and backshoring

**Notes:** <sup>a,b,c,d</sup>Difference is significant at the 0.001 level; <sup>e,f</sup>difference is significant at the 0.01 level; <sup>g,h,i</sup>difference is significant at the 0.05 level. Mean values and level of significant differences between groups by pairwise comparisons between columns for each item; column maximum in italic

In general, there are few factors that are considered “important” or “very important” (a “4” or a “5” in the survey) when making decisions on offshoring. A score of three is a middle position that reflects the fact that the factor is neither important nor unimportant. Only two factors receive a higher average score than three for the offshorers: labour cost and other costs. The bi-directional movers rate four factors above three on average: labour cost, other costs, logistics cost and production close to or in the market. The overall message is that cost elements dominate decision-making on offshoring, and labour cost in particular. The corresponding number of factors for backshoring is nine and nine (i.e. the number of factors with an average above three for “backshorers” and “bi-directional movers”), see Table IV, indicating that backshoring is a much more multifaceted decision than offshoring.

We also analyse whether the plants that have relocated manufacturing in only one direction differ from the plants that have done both off- and backshoring, to understand if the latter group acts differently to those that have only moved manufacturing in one direction. Fundamentally, the results indicate that the plants with experience from relocations in both directions act similarly to plants that have only backshored (backshorers) for backshoring and similarly to plants that have only offshored (offshorers) for offshoring. There are only two significant differences concerning backshoring: production close to or in the market and time-to-market, which the “backshorers” regard as significantly more important. Concerning offshoring, production close to or in the market and logistics cost are both significantly less important for the “offshorers”.

In this context, it is interesting to note that the plants that have both off- and backshored manufacturing treat a number of factors in a more balanced way. For example, there is a gradual move of the scores for 6 out of 21 factors when moving from left to right in Table IV,

i.e. for lead time, flexibility, access to skills and knowledge, access to technology, time-to-market, and for labour cost (however in the other direction – from low to high). This means that the plants that have both off- and backshored typically take a middle position in their consideration of various factors when deciding on backshoring and offshoring, which can be interpreted as aiming at a balanced view of factors for manufacturing relocation decisions. They nonetheless rate a variety of factors significantly differently, i.e. five factors are significant drivers for backshoring decisions, while labour cost is the sole driver for offshoring.

4.5 Benefits

The respondents were asked to indicate to what degree the plant had benefitted from the manufacturing relocation, rating nine factors along a five-point Likert scale from “strongly disagree” (1) to “strongly agree” (5) (see Appendix). Table V shows the results of a two-tailed *t*-test for equality of means.

The results in Table V show that backshoring brings about many benefits concerning flexibility, quality, and deliveries, while offshoring leads to lower labour costs – but not necessarily lower logistics costs or other costs. Actually, “backshorers” exhibit significantly stronger benefits in terms of logistics costs and other costs than “offshorers”. In general, the benefits of backshoring projects seem to be substantial, since almost all mean values are well above three. This includes all aspects of flexibility, quality and delivery as well as logistics costs and other costs. The only factor that receives a lower value, around three, is labour costs. When we look at the benefits associated with offshoring projects, we see the reverse. Only labour costs have a mean value well above three, while all other benefit areas receive scores around three or below.

The plants that have moved production in both directions report significantly higher benefits for product quality, process quality, delivery speed and delivery reliability for backshoring, while labour cost is the only benefit associated with offshoring. Again, it is noticeable that the plants that have both off- and backshored have a more balanced view. There is a gradual move of factor means when moving from left to right in Table V for all factors except labour cost, i.e. for eight out of nine factors. Once again, this suggests that the plants that have both off- and backshored are aiming at a balanced distribution of production.

4.6 Comparing drivers and benefits

Comparing *ex-ante* drivers (see Table IV) and *ex-post* benefits (see Table V) associated with backshoring and offshoring, we find that these are strongly aligned for all types of plants. These results relate well to the OLI framework in that cost advantages are expected for

Benefits	Only offshoring	Both off- and backshoring Offshoring	Backshoring	Only backshoring
Volume flexibility	3.01 <sup>a,g</sup>	3.40 <sup>f</sup>	3.45 <sup>e,g</sup>	4.09 <sup>a,e,f</sup>
Product quality	2.67 <sup>a,d</sup>	2.80 <sup>b,c</sup>	3.63 <sup>b,d,g</sup>	4.07 <sup>a,c,g</sup>
Product mix flexibility	2.96 <sup>a,g</sup>	3.02 <sup>b</sup>	3.37 <sup>e,g</sup>	4.02 <sup>a,b,e</sup>
Delivery reliability	2.66 <sup>a,c</sup>	2.82 <sup>b,e</sup>	3.52 <sup>c,e</sup>	3.91 <sup>a,b</sup>
Process quality	2.54 <sup>a,d</sup>	2.75 <sup>b,c</sup>	3.68 <sup>b,d</sup>	3.87 <sup>a,c</sup>
Delivery speed	2.60 <sup>a,c</sup>	2.92 <sup>b,g</sup>	3.50 <sup>c,g</sup>	3.86 <sup>a,b</sup>
Logistics costs	2.77 <sup>a,h</sup>	2.98 <sup>e</sup>	3.23 <sup>g,h</sup>	3.75 <sup>a,e,g</sup>
Other costs	3.06 <sup>e</sup>	3.37	3.45	3.68 <sup>e</sup>
Labour costs	4.03 <sup>a,b</sup>	3.67 <sup>e,f</sup>	2.76 <sup>b,e</sup>	3.05 <sup>a,f</sup>

**Notes:** <sup>a,b,c,d</sup>Difference is significant at the 0.001 level; <sup>e,f</sup> difference is significant at the 0.01 level; <sup>g,h</sup> difference is significant at the 0.05 level. Mean values and level of significant differences between groups by pairwise comparisons between columns for each item; column maximum in italic

**Table V.** Benefits of off- and backshoring

offshoring from Sweden, while quality, lead-time, and flexibility advantages are expected for backshoring. Quality, lead-time and flexibility are key drivers for backshoring decisions and all aspects of these – product and process quality, delivery speed and reliability, and product mix and volume flexibility – are cited as significant benefits from backshoring. Labour cost is the main driver for offshoring and is cited as a significant benefit. However, the other two cost elements in this study – logistics costs and other costs – do not indicate the same type of alignment. While there were virtually no differences for these as drivers for off- and backshoring, the benefits in terms of logistics and other costs are significantly higher for backshoring than for offshoring. Thus, one cost element – labour cost – is the only factor that is significantly associated with offshoring, as driver and as benefit.

A combined view of drivers and benefits shows that there is a very clear division of factors. Many drivers and benefits are significantly different between off- and backshoring at the 0.001 level (see Tables IV and V, respectively for drivers and benefits): labour cost is significantly more relevant for offshoring, while quality, lead time/delivery, and flexibility are significantly more relevant for backshoring.

## 5. Discussion

### 5.1 Contributions

This paper contributes empirical evidence of the extent, type of production, drivers, and benefits of both offshoring and backshoring of Swedish manufacturing. First, the data on the extent of offshoring vs backshoring indicate that Swedish plants have been very active in relocating manufacturing. In particular, the ratio between the number of backshoring and offshoring projects indicates that about half as much manufacturing returns relative to what is offshored. The high proportion of backshoring relative to offshoring in Sweden is partly explained by the fact that offshoring projects are typically labour-intensive (which does not fit well with Swedish manufacturing), while backshoring projects concern complex production, which is better aligned with Swedish-based capabilities in R&D and technology development.

Second, our unique data set allows us to identify significant differences between offshoring and backshoring for type of production, drivers, and benefits. Offshoring is strongly associated with labour-intensive production, with labour cost as the sole driver and recognised as the sole benefit. These aspects are significantly higher for offshoring projects than for backshoring projects. Backshoring, on the other hand, is strongly associated with complex production and a variety of drivers and benefits, among others quality, lead-time and flexibility. All these aspects are of significantly higher importance for backshoring projects than for offshoring projects. In essence, this indicates that Swedish plants seem to be well equipped to take on complex tasks that require high competence levels in general.

Third, there is a strong association between drivers and benefits. The benefits reported from offshoring and backshoring activities echo the corresponding drivers, i.e. labour cost for offshoring and quality, delivery and flexibility for backshoring. It should be noted that: product as well as process quality; delivery speed and reliability; and product mix as well as volume flexibility were ranked significantly higher for backshoring than for offshoring. These results are also coherent with the type of production that is relocated, i.e. offshoring labour-intensive and backshoring complex production.

Fourth, we find that offshorers and backshorers think and act fundamentally differently when it comes to manufacturing relocation. In addition, the plants that have both offshored and backshored manufacturing in the last five years, i.e. the bi-directional movers, act as offshorers for offshoring and as backshorers for backshoring. This implies that they have made a distinct differentiation between what to offshore and what to backshore in order to improve performance, and that bi-directional movers consider two fundamentally different sets of location factors for the two relocation directions.

In summary, the first contribution relates to *RQ1*, while the second, third, and fourth contributions relate to *RQ2*. Both research questions are thus addressed.

5.2 Comparison with other studies

Table VI presents a comparative summary of the results from this study with previous survey results from other geographical regions, i.e. from New Zealand (Canham and Hamilton, 2013), Europe (Dachs and Kinkel, 2013), and Germany (Kinkel and Zanker, 2013), that present comparable results to this study. These studies report on extent (in terms of the number of companies that offshored and backshored), type of production, and drivers. The present study adds new results on extent in terms of the number of projects in each direction and benefits from relocation, and provides tests of significant differences between offshoring and backshoring for type of production, drivers, and benefits.

The share of Swedish firms and plants that have offshored and/or backshored is considerably higher than in other countries; the only exception is offshoring from New Zealand. The proportion of backshoring relative to offshoring is much higher in Sweden – 74.2 per cent during the last five years (the corresponding numbers for the other countries or

Location	New Zealand Canham and Hamilton (2013) 2001-2011	Europe Dachs and Kinkel (2013) 2007-2009	Germany Kinkel and Zanker (2013) 2010-2012	Sweden This study 2010-2015
<i>Extent</i>				
No. of companies (NZ, EU, GER) or plants (SWE)				
Offshoring	44.3%	10-22%	8%	35.7%
Backshoring	7.3%	3-7%	2%	26.5%
Back/Off	16.5%	31.3%	25%	74.2%
No. of projects per plant				
Offshoring	–	–	–	1.36
Backshoring	–	–	–	0.77
Back/Off	–	–	–	56.2%
<i>Type of production</i>				
Offshoring	Consumer goods and industrial goods	Clothing, Leather	–	Labour intensive production
Backshoring	Consumer goods	Chemicals, Textiles	–	Complex production
<i>Drivers</i>				
Offshoring	Labour cost	–	Labour cost	Labour cost
Backshoring	Quality Flexibility Lead time “Made in NZ”	Quality Flexibility	Flexibility Quality	Quality Lead time Flexibility Access to skills/knowledge Access to technology Proximity to R&D
<i>Benefits</i>				
Offshoring	–	–	–	Labour cost
Backshoring	–	–	–	Flexibility Quality Delivery

**Table VI.**  
Summary of main  
findings and  
comparison with  
previous survey  
studies

regions range between 16.5 and 31.3 per cent). This is supported by the data on the number of projects and the effect on employment in Sweden, both amounting to 56.2 per cent for backshoring relative to offshoring. Sweden is thus closer to reaching an equilibrium between offshoring and backshoring than other countries – the net effect is nonetheless a reduction of manufacturing in Sweden. This figure is much higher than for any other country for which data are available, which indicates that Sweden is relevant as a manufacturing country, at least for complex production requiring R&D, technology, and skills and knowledge.

The drivers for offshoring decisions are consistent with previous research – labour cost is the sole dominating factor. Backshoring is more complex; this study confirms the basic factors quality, lead-time and flexibility. In addition, we find three other factors are just as important: access to skills and knowledge, access to technology, and proximity to R&D. All six factors are significantly more important for backshoring than for offshoring decisions. Canham and Hamilton (2013) also identify “Made in New Zealand” as a very important factor for bringing production back to New Zealand, strongly emphasising local production. The brand name “Made in Sweden” used to be strong internationally, but the role has been downplayed over the years. Instead, concepts like “Designed in Sweden” have appeared which signifies that local R&D may be considered more important than local production in the context of Sweden.

Finally, we note that while benefits have not been reported in the other studies, the results of this study indicate a strong association with the drivers for the relocation decisions – labour cost for offshoring projects and quality, lead-time and flexibility for backshoring projects.

## **6. Implications, limitations, and further research**

### *6.1 Implications for managers*

For practitioners, this research provides current empirical evidence and adds to the body of knowledge on how plants act concerning off- and backshoring. Practising managers can compare their perceptions and experience to our results on what other companies are actually doing. These results can serve as a benchmark (at least for highly industrialised countries) concerning what type of manufacturing to relocate, how much and how often. Labour cost is still regarded as the dominant (and the only significant) factor for making offshoring decisions, while factors related to quality, lead time and delivery act as drivers for backshoring in addition to access to technology, skills and knowledge as well as proximity to R&D. We also find that complex production is significantly more backshored than offshored, while the reverse holds for labour-intensive production. Complex production relates well with quality, flexibility, and delivery focus, while labour-intensive production relates well with a cost focus. The type of production and drivers thus correlate well. Drivers and benefits associated with offshoring and backshoring are also strongly aligned, indicating that intended advantages are realised through the manufacturing relocation in each direction. This is also verified by the plants that have moved production in both directions, i.e. they offshore for cost advantages and backshore for non-cost advantages. Since they have carried out a considerable number of offshoring as well as backshoring projects, it is clear that the rationale for moving production in one direction is very different from moving production in the other direction.

Overall, the results indicate that alignment between type of production and drivers is important to achieve the expected benefits. A coherent strategy for manufacturing relocation is therefore needed that makes a clear distinction between what should be offshored and what should be backshored.

### *6.2 Implications for researchers*

For researchers, the study provides evidence of the statistically significant differences between offshoring and backshoring decision-making and experience, and shows that the



two directions of manufacturing relocation are managed in very different ways, even at plants that both offshore and backshore. The directions differ in terms of extent, geography, type of production, drivers and benefits. Our empirical findings are well aligned with the theoretical predictions of the OLI framework, considering the context of Sweden. From the Swedish perspective, it is reasonable to offshore labour-intensive production while complex production is kept at the domestic location, because of the relatively higher labour costs compared to other countries. We also find that for Swedish firms, offshoring relates to efficiency seeking (labour cost only), while backshoring relates to efficiency seeking (quality, flexibility) as well as strategic asset seeking (skills and knowledge). In addition, manufacturers want to be close to R&D activities, which are primarily internalised (i.e. the “I” advantage) in the home country. Thus, our study supports the relevance of the OLI framework for backshoring, in addition to offshoring.

Two interesting features of this research are: the use of a similar set of questions for off- and backshoring, allowing us to contrast the factors for the two types of activity; and the distinction between “offshorers”, “backshorers”, and “bi-directional movers”, that provided additional insights into the phenomenon of offshoring vs backshoring. We find that plants that relocate production in both directions fundamentally act as “offshorers” for offshoring, and as “backshorers” for backshoring. However, the results also indicate that these plants are more moderate in their valuation of different drivers and thus have a more balanced view of manufacturing relocation, striving for rightshoring.

Since the average offshoring project affects equally many employees as the average backshoring project, the relative number of backshoring and offshoring projects is indicative of the total proportion of backshoring relative to offshoring (even in terms of employment). The number of projects can thus serve as an indicator of the total relationship between backshoring and offshoring in a particular country and can help to predict when the extent of backshoring may surpass that of offshoring. We strongly advocate the use of relocation projects as an indicator of extent rather than just counting the firms or plants that have experienced offshoring or backshoring, since larger plants relocate more than smaller plants.

### *6.3 Limitations and suggestions for further research*

One limitation is the geographical focus on relocations to and from Sweden. It should be recognised that Sweden is a region characterised by high-cost manufacturing and limited market size, but good infrastructure in terms of skills and knowledge, technology and R&D facilities. The results that are comparable with Germany and New Zealand indicate similarities in terms of type of production and drivers, which indicates that our new findings concerning statistical differences between off- and backshoring based on significance tests as well as the findings on benefits would likely be applicable to these regions. We therefore believe that the results are relevant for highly industrialised countries and regions in general, with the possible exception of the very high proportion of backshoring projects relative to offshoring projects that may not be expected in other countries. At the same time, the figures indicate that it is indeed possible to attract manufacturing to a high-cost country. However, further studies are needed to investigate the specific circumstances that facilitate the return of Swedish manufacturing to better understand this phenomenon.

This research opens up a couple of avenues for further research. First, surveys that capture both off- and backshoring in other parts of the world, in order to get a wider understanding of the geographical aspects of relocation and the current state worldwide as well as to investigate the potential contingency effects of different geographical regions. Second, longitudinal survey studies, to capture the relative progression of offshoring vs backshoring activities as well as changes in type of production, drivers, and benefits. Third, it would be interesting to derive empirically driven bundles of drivers to understand how these are logically grouped based on actual data rather than conceptual expectations, and thereby better comprehend the

complexity of decision-making, e.g. concerning how many dimensions that need to be taken into account. Finally, in-depth case studies on decision-making processes and experiences for manufacturing relocation and strategies for manufacturing network restructuring, e.g. at plants that move manufacturing in both directions, to investigate how they use relocations towards rightshoring, to balance and optimise their manufacturing network.

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**Appendix. Survey questionnaire**

Type of production (N.B. same set of questions for offshoring and backshoring)

What are the characteristics of the production that was moved? (1=Very low, 2=Low, 3=Neither high, nor low, 4=High, 5=Very high)

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T1.	Production volume
T2.	Production complexity
T3.	Labour intensity
T4.	Product standardisation (level of ...)

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(Based on: Kinkel, 2012; Canham and Hamilton, 2013)

Drivers of relocation projects (N.B. same set of questions for offshoring and backshoring)

Please indicate the importance of the following factors in the decision to move production: (1=Very low, 2=Low, 3=Neither high, nor low, 4=High, 5=Very high)

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D1.	Labour cost
D2.	Logistics cost
D3.	Other cost
D4.	Changes in the currency exchange rates
D5.	Production close to or in the market
D6.	Access to skills and knowledge
D7.	Access to technology
D8.	Access to raw materials
D9.	Proximity to R&D and product development
D10.	Flexibility
D11.	Lead-time
D12.	Quality
D13.	Risk diversification
D14.	Country-specific conditions (e.g. subsidies, taxes, duties)
D15.	Trade barriers (e.g. customs, quotas, local content requirement)
D16.	Focus on core areas (and outsource non-core)
D17.	Avoid investments in new equipment
D18.	Requirement from customer (to move with customer)
D19.	Follow industry practice
D20.	Shortage of qualified personnel
D21.	Time-to-market (bringing new products to market faster)

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(Based on: Kinkel, 2012; Canham and Hamilton, 2013; Tate *et al.*, 2014; Ancarani *et al.*, 2015)

Benefits of relocation projects (N.B. same set of questions for offshoring and backshoring)

Please consider if your company benefitted in the following areas from moving production:

(1=Strongly disagree, 2=Somewhat disagree, 3=Neither agree nor disagree, 4=Somewhat agree, 5=Strongly agree)

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B1.	Labour cost
B2.	Logistics cost
B3.	Other costs
B4.	Product quality
B5.	Process quality
B6.	Delivery speed
B7.	Delivery reliability
B8.	Volume flexibility
B9.	Product mix flexibility

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(Based on: Authors)

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