



Make at home or abroad? Manufacturing reshoring through a GPN lens: A Norwegian case study



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ABSTRACT

The explorative paper investigates the drivers for the emerging trend of manufacturing reshoring from low- to high-cost locations. To date research on the reshoring phenomenon has been dominated by micro-level analyses of firms in supply chain management and reported in international business literature. The paper introduces reshoring as a research topic to the economic geography research field, arguing that it connects with the broader topic of regional development. To provide a better understanding of the reshoring phenomenon and to test the applicability of the global production network (GPN) framework in the analysis of the phenomenon, the authors analyse the reshoring of nine of Norwegian manufacturing firms. With the multiscale lens provided by the GPN framework, the authors find that the implementation of advanced manufacturing technologies is a driver for manufacturing reshoring, but only when matched with key regional assets such as automation knowledge and competence, key human capital, and region-specific manufacturing competence. Additionally, reshoring decisions are influenced by extra-regional factors such as changes in the global economy and market fluctuations. Furthermore, the paper provides a refined conceptualization of strategic coupling processes by including acts of disinvestments and reinvestments performed by actors within global production networks. Accordingly, the authors advocate a more nuanced understanding, defined as partial coupling processes, in contrast to the predominant understanding of coupling processes as ruptures. This refined conceptualization provides enhanced analytical purchase when studying the reshoring phenomenon, as it illuminates the complexity of firms' production and sourcing strategies and the resulting implications for the economic landscape.

1. Introduction

A key trend, especially over the last three decades, has been that many European and Northern American manufacturers have moved all or parts of their production activities to low-cost countries in Asia, Eastern Europe and Latin America (Neilson et al., 2014). Offshoring and outsourcing of production are conscious firm strategies to achieve comparative advantages (Blinder, 2006, Coe and Yeung, 2015, Stentoft et al., 2016), such as lower labour costs and access to emerging markets (Lonsdale and Cox, 2000). These processes of locational switch, which more recently have seen companies from emerging economies such as China move their production activities to less developed Asian economies such as Vietnam (Sirkin, 2019), have been central to processes of economic globalization (Dicken, 2015).

Offshoring and outsourcing from high-cost to low-cost countries remains the dominant modus operandi in global sourcing (Coe and Hess, 2013, De Backer et al., 2016) and therefore also continues to be a

topic of interest within several research fields, including economic geography (Manning et al., 2018). However, a manufacturing reshoring trend has emerged where firms in high-cost countries 'take back' manufacturing or service activities from low-cost nations. Within the period 2015–2018, 253 reshoring cases (85% of those within manufacturing) created approx. 12 840 jobs in Europe (Eurofound, 2019). In this paper, we refer to the phenomenon of manufacturing repatriation as *reshoring*. The phenomenon is also known as *homeshoring* and *backshoring*. The reasons for the strategic decisions regarding locational or re-locational switch are many and vary across sectors and firms (Theyel et al., 2018). They include increasing production costs in emerging economies, growing digitalization in OECD economies, and miscalculation of total costs in decisions made prior to offshoring (De Backer et al., 2016, Barbieri et al., 2017).

This paper emanates from the observation that advanced manufacturing technologies potentially play an important part in reshoring decisions. Advanced and novel manufacturing technologies, often

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bundled under the rubric of ‘Industry 4.0’ (e.g. industrial robots and automation, the Internet of Things (IoT), Big Data, machine learning, and 3D printing), can have disruptive effects on the spatial and functional organization of manufacturing (Kagermann et al., 2013, Gress and Kalafsky, 2015). Investments in technology have been recognized as imperative for manufacturers in high-cost countries to remain competitive (Brennan et al., 2015). We propose that the ability to implement and utilize new manufacturing technologies is decisive, and that this ability is at least partly conditioned by the local, regional and national context in which firms (or firm subsidiaries) are embedded. Decisions to offshore or reshore (parts of) production will be contingent on firms’ position in global production networks (GPNs) that are themselves dynamically evolving. We suggest that the GPN framework (Yeung and Coe, 2015) provides novel explanatory power to the intricate processes of manufacturing reshoring. Our reasoning is that the GPN framework puts complex multi-actor interaction centre stage, while being highly sensitive to the multidimensional institutional embedding of various firm and non-firm actors in different places and at different scales (Coe and Yeung, 2015), and how this may change over time (MacKinnon, 2012, Yang, 2013).

There have been relatively few studies of technology and automation as enablers of manufacturing reshoring (Barbieri et al., 2017) and the reshoring phenomenon has received limited scholarly attention from economic geographers (Vanchan et al., 2017). This paper aims to introduce the reshoring phenomenon to the field of economic geography in general, and to the global production network literature in particular. As reshoring refers to dynamic (temporal) processes with distinct spatial (regional) outcomes in terms of the geographies of production networks, we find it highly relevant for economic geographers. To analyze our empirical findings we draw on the GPN concepts cost-capability ratio, embeddedness, regional assets, strategic coupling, and market imperatives. As such, we provide a novel approach to understanding the reshoring phenomenon that acknowledges intra-firm, inter-firm (value chain/production network) and (geographical/value chain) embeddedness aspects. We apply and test this framework in an exploratory study of nine manufacturing companies in Norway (a high-cost country). These nine companies have recently reshored manufacturing activities (partially or in full), suggesting an ability for high-cost locations to construct or reconstruct a comparative advantage in global markets. The firms are diverse and operate within different industries and value chains. The main research question that guides our analysis is *What are the drivers for manufacturing reshoring to a high-cost country such as Norway?*

To date, research on reshoring in the Norwegian context has focused on intra-firm strategies and processes influencing reshoring decisions from a supply chain management perspective (Nujen et al., 2018). Although reshoring is a limited phenomenon in numbers – both in Norway and other countries (Barbieri et al., 2018) – we see it as a highly interesting topic for industry, policy and research, not least because it bears witness to processes that counteract the dominant trends of outsourcing and offshoring in the organization of manufacturing (Coe and Hess, 2013, De Backer et al., 2016). As such, it also challenges the established spatial division of labour (Massey, 1984) in many manufacturing sectors, with research, design and development in the Global North and manufacturing in the Global South.

The remaining part of this paper unfolds in five sections. In the next Section 2, we discuss the relevance of reshoring, elaborate on the concept and explanations of the phenomenon, and thereafter present and discuss the GPN framework and develop our analytical framework. Section 3 outlines our methods and data, while our findings are presented, analysed and discussed in Section 4. In the final Section 5, we conclude, discuss the usefulness of a GPN approach to understanding manufacturing reshoring, specify key questions for further research, and discuss policy implications.

2. Theory: A GPN perspective on manufacturing reshoring

2.1. Manufacturing reshoring: On the agenda?

Manufacturing reshoring has attracted attention from policymakers and governments in recent years. Some of the reasons for policy interest in reshoring and strengthening of domestic manufacturing industries are job creation (resulting in e.g. increases in tax revenues), exports, and R&D spending that has generated innovations and competitiveness (Stentoft et al., 2016). As a consequence, policymakers in some developed economies have been proactive in creating policies that instigate manufacturing reshoring.

The financial crisis of 2008–2009 has been identified as a starting point for the development of reshoring strategies in the USA (Tate et al., 2014). The Obama administration was particularly engaged in reshoring policies and put forward the ‘Blueprint for an America built to last’, whereas the ‘Make it in America’ initiative provided USD 40 million in grants for reshoring initiatives (The White House, 2012). Reshoring also figured prominently in the 2016 Trump campaign. However, there is little evidence to suggest that American manufacturers reshore due to policies implemented by the USA government. Instead, companies are relocating to the USA due to increasing prices and wages in the Global South (especially China), access to cheap USA energy, changes in customer demands, increased transportation costs, and increased risks associated with intellectual property rights (Margolis, 2018).

In Europe, the *Industrie 4.0* initiative in Germany has made EUR 200 million available for initiatives focusing on technology and innovation, which in turn may lead to a strengthened manufacturing industry and facilitate reshoring (European Commission, 2017). The European Commission (2010) identifies advanced manufacturing technology as one of six key enabling technologies, which are seen as the basis for increasing innovation and renewing/strengthening European competitiveness in the global economy. Merlin-Jones (2012) points out that the manufacturing sector in the UK has been catalysed by advanced manufacturing technologies, enabling some of the remaining UK manufacturers to succeed within certain niche markets. Bailey and De Propris (2014, 393) call for ‘a more long-term, proactive and holistic pro-manufacturing industrial policy’ in order to persuade British manufacturers to repatriate manufacturing operations. Since the recession in 2008–2009, the policy debate in the UK has centred on ‘rebalancing’ the entire economy. With a relatively small manufacturing industry (8% of employment in 2016 (Vanchan et al., 2017)), the policy discussions have not gained traction.

In Norway, reshoring has received some attention from public bodies, industry organizations, media, and academia (Teknologirådet, 2013, Nujen et al., 2018). There is no explicit policy related to reshoring, and it is only mentioned in a brief passage in a recent Norwegian White Paper on industrial policy (Meld St. 27 (2016–2017) a, b). Norwegian industrial policy is rather focused on supporting research and innovation aimed at improving existing industries through initiatives such as Norwegian Innovation Cluster and Norsk katapult (national centres for prototyping and product development) (Norwegian Innovation Cluster, n.d., Norsk katapult, n.d.) to ensure that Norway remains an attractive host location for manufacturing (Meld St. 27 (2016–2017)).

To summarize, manufacturing reshoring has to some extent made an impact on political agendas in high-cost countries. However, in order to inform policymakers and governments about the potential for and impact of reshoring, studies that recognize the phenomenon’s multiscale dimensions and explanations are needed.

2.2. Offshoring and reshoring – A brief overview

Manufacturing relocation from high-cost to low-cost nations (i.e. offshoring and outsourcing) is a widely studied phenomenon, reflecting

a key component in global sourcing strategies for firms in developed economies in recent decades (Blinder, 2006). The primary reasons for these processes of locational switch relate to competitiveness and the necessity of moving production – either to neighbouring countries, as in the case of Western European firms relocating to Eastern Europe, or to more distant lands (e.g. Southeast Asia) – in order to access cheaper labour and/or emerging markets (Lewin et al., 2009). These strategies have been manifested through foreign direct investments (FDI) and the establishment of new branch plants, the acquisition of existing manufacturers in new host locations, or the outsourcing of production to external suppliers.

Offshoring and outsourcing continue to be the dominant sourcing strategies for manufacturing companies today (Coe and Hess, 2013, De Backer et al., 2016). However, there is an emerging trend of reshoring, which refers to production being relocated from low-cost to high-cost nations. Previous studies of the reshoring phenomenon reported in the supply chain management (SCM) and international business (IB) literature primarily focused on *why* manufacturers reshored (Barbieri et al., 2017, Wiesmann et al., 2017). A number of reasons for the reshoring have been identified and they can be grouped into two main categories (Bals et al., 2016). The first category is related to intra-firm explanations, wherein reshoring occurs as corrections of *managerial mistakes* in the form of poorly informed location decisions, often based on inaccurate calculations in terms of total costs (e.g. labour, logistics/shipping) (Kinkel and Maloca, 2009). The second category is related to societal and/or economic changes, wherein reshoring occurs as ‘a deliberate response to endogenous and exogenous changes’ (Barbieri et al., 2017, p. 13), such as altered market conditions, rising costs in offshore locations, or increased digitalization in the home economy (De Backer et al., 2016). Additionally, Kinkel (2014) proposes that high levels of product complexity, customization, and small-batch production increase the likelihood of reshoring. With regard to digitalization, studies of the influence of advanced manufacturing technologies and automation on firm locational decisions have largely been neglected (Barbieri et al., 2017). However, we find this an important topic to address, not least because technology adoption alters firms’ cost–capability ratios. In this study, we aim to advance the understanding of these factors in reshoring decisions. First, it is necessary to discuss briefly the different definitions of manufacturing repatriation, and how reshoring is defined in this paper.

There are several conflicting definitions in the SCM and IB literature aimed at describing the manufacturing repatriation process, reflecting how different aspects have been emphasized differently when defining the concept of manufacturing relocation (Barbieri et al., 2017). Furthermore, different terms are used for the same phenomenon, including *back-reshoring* (also including ‘born global’ firms) (Fratocchi et al., 2015), *backshoring* (Kinkel and Maloca, 2009), and *reshoring* (Gray et al., 2013). This conceptual fuzziness may lead to lack of clarity, as scholars also ‘use the same term (for instance, reshoring) to indicate different concepts’ (Barbieri et al., 2017, 8). As we aim to explore the reshoring phenomenon in a Norwegian context, where there is evidence of both full and partial relocation of production and different sourcing elements, we find the concept *reshoring* to be suitable for our purpose. Reshoring has been used as a general term for manufacturing relocation to a ‘home economy’ in recent literature reviews which various aspects of reshoring have been studied (Barbieri et al., 2017, Wiesmann et al., 2017). In order to provide an understanding of recent manufacturing relocation to Norway, we define reshoring as the *relocation of manufacturing, including both sourcing and shoring strategies from a host location to a home location*. As such, the definition provides leeway for an explorative analysis of relocation decisions.

As mentioned in the Introduction (Section 1), we suggest that the GPN framework provides a novel approach to understanding both the explanations for and the implications of the reshoring phenomenon. Accordingly, we propose that the various forms of locational switch (e.g. offshoring, reshoring, insourcing, and outsourcing) are on-the-

ground mechanisms that underlie different types of coupling processes between territorialized assets and the needs of key actors in global production networks (MacKinnon, 2012). Analysing these processes by using the above-mentioned key concepts from GPN thinking provides an extended understanding of the enabling factors that instigate manufacturing reshoring. Moreover, and contrary to the SCM and IB literature, the GPN perspective adds explanatory power to understanding reshoring beyond the firm level by devoting explicit attention to the influence of non-firm actors and contextual conditions (directly or indirectly) on firms’ decisions.

2.3. Global production networks

The reshoring of manufacturing is essentially a location decision (Gray et al., 2013), which therefore has explicit geographical outcomes, and, we suggest, geographical explanations. To pursue this suggestion and to explore the reshoring phenomenon, we find global production networks (GPNs) a fruitful theoretical point of departure. In line with Coe and Yeung (2015), we consider the GPN 1.0 and GPN 2.0 ‘variants’ as complimentary frameworks and combine concepts from them both in our analysis.

The GPN framework has been developed since the early 2000s (Henderson et al., 2002, Coe et al., 2004). Through disentangling the nexus of firm and non-firm actors efforts have been made to provide a heuristic framework for understanding the development of the global economy and its implications for regional development (Coe and Hess, 2011). The actions made by these firm and non-firm actors are targeted ‘towards the creation, enhancement and capture of value’. Value creation is the process where economic surplus, or *rents* (Coe et al., 2004), is generated by transforming inputs or materials into new products or services. Whereas value creation is primarily done by firms, non-firm actors can contribute to value capture through subsidies, indirect investments or skill development. Value enhancement relates to how knowledge and technology can enable industrial upgrading, i.e. enable regions to claim a higher position within a GPN and thus increase their value capture. Regional assets such as technology and experience based knowledge can be developed (often with supportive regional institutions) to ensure value enhancement for the region. Regional assets and institutions can also be tuned towards promoting value enhancement for GPN lead firms. Lastly, and most importantly in terms of regional economic development, the value capture concept relates to how value is retained within a territory or firm. The ability to capture value is imperative for the region in terms of achieving regional economic development (Henderson et al., 2002, Coe et al., 2004, Coe and Yeung, 2015).

The GPN 1.0 variant provides a multiscale approach to understanding ‘the dynamic organizational and geographical complexities of the global economy’ (Coe et al., 2008, p. 289) by emphasizing local, regional and global ‘economic and social dimensions of the processes involved in many (though by no means all) forms of economic globalization’ (Henderson et al., 2002, p. 445). Particular emphasis is placed on the (regional) territorial development outcomes resulting from multiscale GPN dynamics. GPN 2.0 was developed partly as a response to the tendency of GPN 1.0 and the global value chain framework to ‘under-theorize the origins and dynamics of these organizational platforms’ (Yeung and Coe, 2015, p. 29). The 2.0 approach provides a dynamic framework focusing on how GPN actors’ (especially global lead firms) strategies are shaped by structural competitive dynamics, and how this shapes ‘organizational configurations within and across different industries and localities’ (Yeung and Coe, 2015, 32). The GPN (both 1.0 and 2.0) framework’s emphasis on lead firms has been criticized and questions have been raised concerning its ability ‘to capture globalization’s complex dynamics’ effectively (Murphy, 2012, p. 211). However, Coe et al. (2008, p. 90–91) argue that the empirical entry point to analysing GPNs is unimportant and insist that it depends on ‘the specific focus of the research and the precise research questions

that are being tackled'. In this paper, the case firms are both lead firms and industry-specific specialized suppliers. Thus, we provide empirical insights into traditionally less-studied structures of GPN, namely non-lead firm actors (Coe et al., 2008). In our effort to provide a novel approach to understanding the reshoring phenomenon, we employ five key concepts from the GPN frameworks: (1) cost-capability ratio, (2) embeddedness, (3) regional assets, (4) strategic coupling, and (5) market imperative.

In the GPN 2.0 approach put forward by Coe and Yeung (2015, p. 85), the optimization of cost-capability ratios – ‘the optimization process that allows firms in global production networks to achieve greater firm-specific capabilities and value capture’ – is a key concept. Direct and indirect costs related to production are acknowledged as an important aspect that encourages firms to relocate production and services to low-cost economies, and the direct cost of labour wages is recognized as ‘the most obvious arena for optimization’ (Coe and Yeung, 2015, p. 83). In addition to this resource-based view of firms (Teece, 2009), the GPN framework incorporates firms’ capabilities as essential when analysing their ability to function as actors, key or otherwise, in production networks. Coe and Yeung (2015, p. 84) argue that firm-specific capabilities and cost must be theorized alongside each other, ‘to form a complete and actor-oriented view of the firm’. These firm-specific capabilities can be technology, knowledge/knowhow or organizational capacities. Firm capabilities are regarded as relative and dynamic, which implies that firms are able to develop their capabilities through learning, also with support from extra-firm initiatives such as education or skills upgrading programmes funded by public bodies (Coe and Yeung, 2015). The ability to improve firm-specific capabilities, and their potential to create, enhance and capture value, is influenced by national and regional socio-spatial and economic contexts. Therefore, in order to analyse enabling factors for firms’ reshoring, it is necessary to understand how they are embedded in their host locations.

The embeddedness concept acknowledges how place-specific economic, social, and political contexts influence GPNs. Embeddedness is divided into three ‘specific yet interrelated forms’ – societal, network and territorial (Yeung and Coe, 2015, p. 17). Societal embeddedness highlights the relevance of economic actors’ historic, institutional and cultural heritage, with its “genetic code”, influencing and shaping the action of individuals and collective actors’ (Hess, 2004, p. 176). In relation to GPNs, firms carry this ‘genetic code’ with them when they go abroad, while simultaneously being exposed to the foreign cultures of partner firms within the production network. Network embeddedness describes how relationships between actors, both individuals and organizations (governmental and non-governmental), form networks based on trust and interaction (Hess 2004). By contrast, territorial embeddedness ‘captures how firms and organizations are anchored in different places’ (Coe and Yeung, 2015, p. 18): it is the ‘localized manifestation of networks or nodes in global networks’ (Hess, 2004, p. 180). The social dynamics and economic activities in host locations where firms in GPNs are located can both enable and constrain their development. Such enabling factors are conceptualized as regional assets in the GPN framework.

Regional assets constitute specific endogenous advantages that are necessary preconditions for enabling firms or regions to become part of one or more global production networks. In a reshoring context, the successful development of regional assets can result in regions reclaiming a position within global production networks, and as such enhance regional value capture. Examples of regional assets are technology, specialized know-how, industrial organization, and territorial politics and social relations (Coe et al., 2004, Coe and Yeung, 2015). Regional assets can be strategically developed in collaboration with regional institutions such as educational institutions, labour unions and state agencies, thus indicating import roles (harnessing and upgrading assets) for states and other non-firm actors. Of particular importance is the harnessing of regional assets in order to ‘fit the strategic needs’ of key actors in a global production network (Coe et al., 2004, p. 474). As

such, they constitute the basis on which firms and regions are strategically coupled to global production networks.

In the processes of offshoring and reshoring manufacturing, firms deliberately move production from one location to another. In relation to this relocation, the concept strategic coupling gains relevance, as firms and regions can be coupled, decoupled or recoupled to GPNs with corresponding positive or negative effects on regional development (Yeung, 2009, MacKinnon, 2012). Reshoring refers to a phenomenon with a distinct temporality, as it must have been preceded by some form of offshoring or outsourcing. Therefore, understanding these processes of locational switch requires an approach that explicitly incorporates a temporal dimension. Firms and regions can couple to a GPN if their institutional or firm-specific capabilities can contribute to the overall functioning of the GPN. If a region or firm loses its relevance and influence in the GPN, it can be decoupled, which means there will be a rupture between the region or firm and the GPN. We understand embeddedness and strategic coupling as two interrelated concepts, where networks are embedded in regions through coupling processes in the production networks, and disembedded through decoupling processes. According to Coe and Yeung (2015, 20), strategic coupling has three important characteristics: (1) it is strategic, meaning that it needs ‘intentional and active intervention’ by both lead firms in the GPN and regional institutions; (2) it is time–space contingent, ‘as it is subject to change and is a temporary coalition between local and non-local actors’; and (3) ‘it transcends territorial boundaries as actors from different spatial scales interact’.

Offshoring and reshoring are real-world expressions of what MacKinnon (2012) refers to as decoupling and recoupling, adding an important evolutionary dimension to the dynamics of global production networks and territorial linkages. However, the conceptualization of abrupt coupling processes provided in the GPN literature (Yeung and Coe, 2015) does not provide sufficient analytical purchase in a complex reshoring context with multiple sourcing decisions employed at different times. Therefore, inspired by earlier attempts at conceptual refinement (MacKinnon, 2012) and drawing on recent contributions by Werner (2016), we combine the aspects of disinvestment and re-investment with the concept of strategic coupling to provide a more fine-grained conceptualization of *partial* coupling processes. Thus, we define *partial decoupling* as the result of disinvestments in a region that leads to a relative decrease in value creation and capture in that region. Subsequent *partial recoupling* refers to reinvestment in a region leading to a relative increase in value creation and capture in that region. The variations in value added activity in regions within GPNs are, as emphasized by Coe and Yeung (2015), temporal and subject to change. Furthermore, the variations are influenced by extra-firm factors such as fluctuations in particular markets and the global economy in general.

The GPN literature captures the market dynamics in the market imperative concept (Yeung and Coe, 2015). The market imperative is described by Yeung and Coe (2015) as being created in an interactive process between users and producers that results in market creation. Changes and the emergence of global production networks are then regarded as the ‘organizational outcome’ of market creation processes (Yeung and Coe, 2015, p. 95). When regarded as a process, the market is constantly evolving, thus GPNs are evolving, as shifts within the global economy translate into different local and regional outcomes. Shocks in the global economy, such as the 2008 financial crisis, have the potential to influence entire GPNs (Smith et al., 2014) and have been identified as drivers for manufacturing reshoring (Kinkel, 2012, Tate et al., 2014).

2.4. Approaching reshoring with a GPN lens

The geography of production has been a research topic for geographers since the seminal work of Marshall (1920) and Weber (1929) nearly a century ago. Furthermore, with the extensive offshoring and outsourcing of production from Europe and the US to developing

economies in the 1980, the spatial division of labour (Massey, 1984) became a central topic within the subdiscipline of economic geography. However, the early contributions, as products of their time, focused on how states, social structures and division of labour within and across regions influenced the geography of production. Arguably, the global economy has changed considerably since the 1980s, notwithstanding the fact that non-firm actors such as national states continue to play a key role in the geography of manufacturing (MacKinnon et al., 2019). Thus far, production in 2019 has been considerably more complex and functionally fragmented (Coe and Hess, 2013) than that of earlier times, with networked activities facilitated through increasingly advanced ICT and improved transportation, and other changes enabled by new technologies such as the change from mass production towards mass customization (Gress and Kalafsky, 2015). In order to fathom these complexities, we must change the concepts we employ to study shifting economic landscapes.

In order to encompass the complex, multiscale dimensions of production, and to study the ‘new international division of labour’ (Neilson et al., 2014, p. 1), we employ the outlined global production network framework (see section 2.3) in our analysis. The framework allows for the inclusion of actors from different scales, firm embeddedness, and market dynamics such as customer pressure and time-to-market (Coe and Yeung, 2015) in the analysis, thus providing a more holistic understanding of the complex, multiscale processes of manufacturing reshoring and its implications for regional economic development. As such, our paper complements the existing literature that focuses more on the micro-level (firm-level) processes and explanations for reshoring decisions.

3. Methods and data

Reshoring is an emerging trend and the number of possible cases in the Norwegian context is limited, as is apparently also the case in other countries (De Backer et al., 2016, Kinkel et al., 2017, Olhager et al., 2017, Barbieri et al., 2017, Coe and Yeung, 2019). A research methodology that is exploratory, allows for thick descriptions, and provides in-depth understanding of existing reshoring cases is therefore warranted. We employ an exploratory case study approach (Flyvbjerg, 2006, Yin, 2012), which is advantageous when investigating ‘distinct phenomena characterized by a lack of detailed preliminary research’ (Streb, 2010). As the explanations for the reshoring phenomenon are highly complex, context-specific and, we suggest, multiscale, we employ qualitative research methods that provide holistic accounts of actors and their sectoral, political and spatial contexts (Clark, 1998). The case study methodology provides opportunity for analytic generalization, as findings from our exploratory case study can be applicable when analyzing other, similar, reshoring cases in (other) high-cost countries (Yin, 2013).

Our primary source of data is 11 in-depth semi-structured interviews with key informants in firms that have reshored production, conducted between March 2018 and January 2019. Identification and recruitment of case firms was based on a list of reshored firms published in Norwegian media outlets in 2016 and Eurofound’s European Reshoring Monitor (Eurofound, 2016). The studied firms are located in different parts of Norway and operate within different industries. Our key informants were current and former CEOs (Chief Executive Officers), a COO (Chief Operations Officer), a CTO (Chief Technology Officer), and a VP (Vice President) and PL (Project Leader) in nine firms (Table 1). Our questions revolved around topics such as motivations and explanations for the initial offshoring or outsourcing decision, the experiences gained from manufacturing abroad, the final reshoring decision, and if and how contextual matters provided incentives for reshoring. Through these interviews, we gained invaluable insights into the decision-making processes undertaken and the key rationales behind reshoring decisions in each firm. We also interviewed representatives from the Norwegian Confederation of Trade Unions

(Landsorganisasjonen) and the Federation of Norwegian Industries (Norsk industri) to understand how innovation policy and policy instruments targeted reindustrialization in general and reshoring in particular.

The interview data were supported by secondary sources such as journal articles, media coverage and White Papers. Eurofound’s (2016) *European Reshoring Monitor* constituted a key secondary source of information on the reshoring cases. The monitor provided details on sector and product category of the reshored production and links to media articles covering the reshoring cases. The media articles provided preliminary information on drivers for manufacturing reshoring that was elaborated on in the interviews. The limited scope of manufacturing reshoring in Norway restricted the number of possible informants. To secure anonymity, firms have been given aliases and informants are referred to as the VP, PL, CEO, COO or CTO of their respective firm (Table 1).

The purpose of this paper is to explore the drivers for reshoring of manufacturing to Norway. As this is a relatively limited phenomenon, we interviewed representatives of the majority of firms that to the best of our knowledge (based on, for example, key informant interviews and media searches) have reshored production or parts of their production. Our sample of case firms are quite diverse (Table 2): some are lead firms within their (global) production networks, while others are specialized suppliers (e.g. Tier 1 in the automotive industry).

It should be noted that the labelling of ‘lead firms’ here refers to firms’ position in production networks that may not necessarily be global in scope. Born global firms refer to firms that internationalize from the off-set or near founding rather than in a more incremental and stepwise manner after first growing in the home location (Knight and Cavusgil, 2004). In terms of size, the case firms are relatively homogeneous in that most of them are Norwegian-owned SMEs (small and medium-sized enterprises). As such, the selection of case firms are representative of Norwegian industry, which consists of 99,5% SMEs (Ministry of Trade Industry and Fisheries, 2012). From the description of firms in Table 2, it is evident that the initial reasons for offshoring of production (if there was any) were quite different. Correspondingly, the drivers for reshoring were and are different. We consider that this heterogeneity (in terms of embeddedness, value chains and industries) provides a rich basis for an exploratory study. In the next section, we analyse some of the important drivers for manufacturing reshoring as identified by the case firms.

4. Analysis: manufacturing reshoring through a GPN lens

As discussed in Section 2, to explain why reshoring occurs, the SCM and IB literature has emphasized the ‘internal environment’ (i.e. firm-specific strategies) and direct costs related to labour wages and shipping (Barbieri et al., 2017). The scope of this paper does not allow for an extensive analysis of all of the empirically identified drivers for reshoring (see the summary in Table 2). Rather, we elaborate on the role of technology, knowledge, regional assets and market dynamics, which were identified by our informants as key rationales for manufacturing reshoring. In the following three subsections, we employ key concepts from the GPN framework (cost-capability optimization, regional assets and the market imperative) to analyse the drivers for manufacturing reshoring in our nine case firms. In the final subsection we discuss how different sourcing strategies led to a reconfiguration – through disinvestments and reinvestments – of some of the studied global production networks.

4.1. Technology and knowledge – optimizing cost-capability ratios

Norwegian manufacturers that operate in global industries are continuously competing on commodity prices. The most important factor influencing final product prices has traditionally been the direct cost of labour wages (Coe and Yeung, 2015). However, by investing in

Table 1
Industry informants' affiliation.

Firms	Informants	Market	Reshored from	Reshored production
Aqua	CEO	Aquaculture	China	Moulded plastic components
Auto	Former CEO	Automotive	China	Aluminium car components
Construction	CEO	Construction	Poland	Building solutions for walls, floors and roofs
Marine	COO	Marine	Russia and Ukraine	Winches for anchor-handling vessels and offshore platforms
Maritime	CEO	Maritime	China	Anchor winches for smaller vessels
Offshore	CEO	Maritime and offshore	China	Heating, ventilation and air conditioning (HVAC) systems
Oil and Gas (O&G)	VPPL	Oil and gas	Arab Emirates and Ireland	Components for offshore jacket platforms
Telecom	CTO	Telecommunications	China	High resolution webcams for video conferences (assembly)
Telematics	CEO	Telematics	Lithuania	Tracking systems for vehicles and equipment (assembly)

CEO – Chief Executive Officers, COO – Chief Operations Officer, CTO – Chief Technology Officer, VP – Vice President, PL – Project Leader.

and implementing new and advanced manufacturing technologies – and thereby altering cost-capability ratios (Coe and Yeung, 2015) – firms in high-cost countries can counter the comparative advantage of cheap labour offered in low-cost countries. The former CEO of *Auto* (producing aluminium car components) explained that the owner, a foreign TNC, initially set up production for the European market in China. When the decision was made to move production to Europe, the owner did not want to move production to Norway due to high production costs. However, after comparing other locations in Eastern Europe with Norway, *Auto* proved that by investing in a fully automated production line in Norway and by optimizing their processes and fine-tuning their equipment they could reduce the number of workers per shift from 15 to 3, and produce four times faster than in the previous host location in China. Thus, by optimizing their firm-specific capacities (Coe and Yeung, 2015) through investing in advanced manufacturing technologies, production for the European market was moved from China to Norway.

Advanced manufacturing technology was influential in several of the reshored case firms. The CEO of *Construction* (producing wooden building solutions) explained that the firm was able to relocate most of its production from Poland to Norway after investing in advanced manufacturing technology in a new factory that opened in late 2018. To equip the new production line, the firm has bought 'the best machinery available in Europe today' from Austrian, German, and Swedish suppliers (CEO, *Construction*). The firm follows a strategy of investing in the best possible technology as it wants to be the best on robotization, automatization and digitalization. Many of the same tendencies were described for *Aqua* (producing moulded plastic components for aquaculture net pens), as its production line is 'fingerprint free' (CEO, *Aqua*), meaning there is no manual handling of the product from raw material to final product. The CEO explained that *Aqua*'s production line, equipped with machinery from German, Austrian and Swiss suppliers, was fully automated and could be controlled and supervised remotely. Reshoring can also take place as a consequence of subcontractors' technology upgrading. *Telecom* (producing webcams) reshored production to Norway due to the subcontractor's ability to automate production. The CTO explained that 'it is important that we work with [subcontractor] to reduce the cycle time and the number of workers on the line'. The CTO further elaborated that the 'focus on as few seconds as possible per worker per product is essential ... If you can do that right, you can produce in Norway and compete globally'. Based on the above examples, it is clear that manufacturing reshoring to Norway has been enabled partly by advanced manufacturing technologies. Through investments in these technologies, the firms have optimized their cost-capability ratio (Coe and Yeung, 2015) and improved their relative competitiveness vis-à-vis competitors in more low-cost locations. However, other forms of cost-capability optimization have also been influential.

For *Offshore* (producing HVAC systems), the development of design for manufacturability competence (i.e. reducing production costs by optimizing the product design) has enabled the firm to reshore

manufacturing from China. The access to relatively cheap labour in China influenced the way *Offshore*'s products were designed: 'the design we had on what we produced over there was made simple in terms of welding and assembling ... you did not have to be very competent to put things together.' (CEO, *Offshore*).

Through increasing the product design complexity, *Offshore* made the assembly process more complex, but reduced the number of components that needed to be welded. The reduced welding time halved the number of labour hours, and labour hours was 'the one and only [factor] that makes it profitable to produce in China' (CEO, *Offshore*). The CEO added that by 'complexity' he was referring to changes in design that required workers to be able to read and understand technical drawings. In a similar manner, the CEO of *Telecom* underlined the importance of collaborating with the firm's Norwegian contract manufacturer to simplify its product design and optimize the assembly process. Thus, optimizing firm-specific capacities (Coe and Yeung, 2015) in terms of knowledge and competence is also a driver for manufacturing reshoring.

The combination of investing in advanced manufacturing technologies and access to a knowledgeable and competent workforce makes it 'possible to run the factory with relatively few, but highly skilled workers' (CEO, *Construction*). Evidently, it is necessary for a firm to develop multiple firm-specific capabilities (Coe and Yeung, 2015) in order to gain a competitive advantage. However, these firm specific capabilities are not developed by the firms alone. In Norway, highly skilled workers, at all educational levels, are relatively accessible (albeit not uniformly across locations and regions) due to the Norwegian education system, which by providing key human capital can be characterized as a key regional asset.

4.2. Regional assets – enabling manufacturing reshoring

The regions where the studied firms are located hold certain comparative advantages by virtue of their history. The concept of regional assets (Coe et al., 2004) is highly connected to the concept of embeddedness (Hess, 2004). The particular assets that create comparative advantages for a specific region are the result of both firm actors' and non-firm actors' strategic development of those assets. Regional assets are often developed in collaboration with regional institutions (Coe and Yeung, 2015). The Norwegian education system, which in GPN terminology (Coe et al., 2004) can be considered a regional institution (i.e. a non-firm actor) is one such comparative advantage. The state provides free primary and secondary education, as well as free college and university education during which students are supported by student loans and grants. In this sense, firms' social and territorial embeddedness becomes influential, as the Norwegian education system provides highly skilled workers at all educational levels, from factory floor and up (Statistics Norway, 2018). This, in turn, is important for enabling firms to implement advanced manufacturing technologies in production lines. Collaboration between industry and vocational education institutions provides knowledgeable skilled workers with skills and

Table 2
Description of case firms.

Firm	Type	Role in GPN	Workers (in NOR production site)	Revenue 2017 (in millions)	Offshoring reason	Internal drivers for reshoring (pull)	External drivers for reshoring (push)
Aqua	Norwegian SME	Specialized supplier (Industry-Specific)	33	\$8.2	Lead firm outsourced production to foreign third-party manufacturer	Improved cost capability ratio (technology), proximity to market	Transportation costs, lead time
Auto	Foreign TNC, branch plant	Specialized (Tier 1) supplier	191	\$68.6	TNC's decision to manufacture in Chinese branch plant for EU market	Improved cost capability ratio (technology), proximity to market access to skilled labour, access to regional competence	Transportation costs
Construction	Norwegian SME	Lead firm	111	\$44.5	Licence production due to lack of equipment and	Improved cost capability ratio (technology), access to skilled labour	Transportation costs, lack of flexibility, difficult to do product development
Marine	Norwegian SME	Specialized supplier	146	\$62.3	Lack of production capacity at home	Improved cost capability ratio (technology), increased production capacity due to technology	Changes in global economy (resulting in excess production capacity at home)
Maritime	Norwegian SME	Specialized supplier	110	\$42.8	Acquisition of company with production abroad	Available production capacity and machinery	Unsatisfactory product quality, communication difficulties
Offshore	Foreign TNC, branch plant	Lead firm	119	\$17.7	Low labour costs	Improved cost capability ratio (design thinking)	Rising production costs, customer demands on lead time
Oil and Gas	Norwegian TNC	Lead firm	800	-	Lack of production capacity, unfit production facilities (size), cost	Improved cost capability ratio (technology & design)	Transportation cost (raw materials and end product), transaction costs related to coordinating production abroad
Telecom	Norwegian SME	Lead firm	45	\$1.7	Born global	Improved cost capability ratio (technology & design thinking), proximity to production site (enabling product testing and development)	Contract manufacturer unable to produce according to standards, transaction costs related to coordinating production abroad
Telematics	Norwegian SME	Lead firm	240	\$45	Born global	Improved cost capability ratio (technology), proximity to production site (enabling product testing and development)	Language barrier related to coordinating production abroad

competence to operate in a modern manufacturing facility. At *Aqua*, for instance, collaboration with the nearest upper secondary school is important. According to the CEO, the firm had at least two apprentices from the automation technician education programme at all times, which is substantial considering that the firm has 33 employees in total. *Aqua* has also supported the same upper secondary school by donating two industrial robots to ensure that the education programme and the specific competence that students acquire are relevant and fit the firm's particular needs (CEO, *Aqua*). Thus, in practice, the responsibility for developing and maintaining the regional assets of industry-relevant vocational education and training is often shared by private and public actors. Furthermore, the development of these regional assets has contributed to the reshoring of manufacturing and led to enhanced value capture (Coe et al., 2004) and regional economic development. Another regional asset that is made visible on the factory floor and that has been identified as an enabler of manufacturing reshoring is the 'Norwegian Model'.

The 'Norwegian Model' is a version of the Nordic Model (Andersen et al., 2007) and describes the characteristics of collaboration between the state, business and labourers on the nation state level and the local firm level. The Norwegian way of organizing work is based on high levels of trust between employee and employer, relatively flat hierarchical (organizational) structures and collaboration across education levels and backgrounds. The Norwegian model can be characterized as a regional institution that has a positive impact on firms' competitiveness by increasing efficiency (Andersen et al., 2007, Ravn and Øyum, 2018). An egalitarian organization of production and highly autonomous skilled workers helps manufacturers to exploit workers' experiences and develop competence and skills on the shop floor, and thus produce more effectively. This was highlighted by the CEO of *Marine* (producing winches for large vessels and offshore platforms) when talking about working life culture and workers' inclination to report problems to their superiors: 'In this country there is a more easy-going culture, for example in terms of talking to the boss. It is not like that in many other places, where you do not say anything to the boss' (CEO, *Marine*). Further, the CEO of *Marine* explained that problems, for example in production, could be solved faster if operators informed and engaged their superiors. This is important in terms of productivity and limiting downtime. Thus, being located in Norway and embedded in a Norwegian social and economic context is in itself seen as a comparative advantage by some of the firms that have reshored. Additionally, a region's industrial heritage can provide a form of regional asset and contribute to manufacturing reshoring.

In addition, the opportunity and ability to draw on historically developed regional knowledge bases (Asheim and Coenen, 2005) is seen by reshoring Norwegian manufacturers as providing a comparative advantage. The former CEO of *Auto* underlined the importance of the region (and its history) where the firm is located as a key asset in enabling the reshoring of production:

We have a special competence in aluminium. That is what enables us to produce competitive products ... It is the competence in development, technology and R&D ... and also the hub that we have here, where this kind of competence has been developed for 50–60 years, with aluminium components for the automotive industry. (former CEO, *Auto*).

This historically accumulated competence, which emphasizes the importance of regional characteristics and territorial embeddedness, is key to understanding how *Auto* has been able to couple to the GPN. The combination of explicit regional competence in material and processing technologies, the implementation of LEAN methodologies, advanced technologies and the ability to automate, all aided by working closely with key regional R&D institutions, were described as the main drivers for the reshoring of *Auto*'s production. The firm *Construction* is located in the same region as *Auto* and its CEO underlined the importance of recruiting labour from the region. He explained that many of their employees came from

the [region] system, have worked at [firms in that region]. Firms that have done well, but also worked a lot with LEAN and automation. We have been lucky to be able to recruit industry, LEAN and automation people from that system ... We have been lucky compared to others in terms of where we are located.

The quote emphasizes the importance of embeddedness (Hess, 2004). The territorial embeddedness of *Auto* provides access to a certain type of competence that would not necessarily been available had production been located elsewhere, at least not without major investments in learning and competence upgrading. The regional competence (i.e. regional asset) has enabled the recruitment of workers with certain competence, which has contributed to the overall competitiveness of *Auto* and *Construction*.

Essentially, the optimization of firm-capabilities, as discussed in section 4.1, relies on the existence and development of regional assets that underpin firms' capability building. This can, in turn, increase firms' competitiveness and enable reshoring, which subsequently enhances regions' ability to capture value. However, this overall competitiveness needs also to be seen in relation to changing market dynamics and, as integral to that, the changing demands of key customers.

4.3. Market dynamics – customer demands

Factors that influence reshoring decisions are changes in the global economy, within specific markets, and in customer demands, all of which are captured by the market imperative concept (Coe and Yeung, 2015) in the GPN literature. Excess production capacity at home in times of economic instability has been found a driver for reshoring of manufacturing to high-cost countries (Kinkel, 2014, 2012, Wiesmann et al., 2017). From the mid-1990s until 2010 the Norwegian offshore oil and gas market experienced growth, which provided ample domestic business opportunities for *Marine* and other firms in that market. Strong market demand also led to outsourcing of production due to limited production capacity at home. However, the slow yet steady downturn in the offshore oil and gas industry from 2010, and especially since the onset of the oil crisis in 2014 (Hou et al., 2015), resulted in fewer contracts, and *Marine* experienced an excess in production capacity at home. In order to sustain jobs in the firm's home location, *Marine* reshored previously outsourced contracts from subcontractors in Russia and the Ukraine. The outsourcing of production worked as a buffer, creating stability for *Marine* by ensuring contracts within the company when the economic situation was beneficial and ensuring jobs in their home location through reshoring during market downturns and economic instability. While further market-specific changes resulted in reshoring for *Marine*, changing customer demands had a strong influence on the reshoring of *Offshore*.

Customer demands, or customer pressure (in GPN terminology), and time-to-market are identified as two of four key dimensions of the market imperative (Coe and Yeung, 2015). A combination of what the CEO of *Offshore* perceived as changes within the market and customer demands for shorter lead times on finished products contributed to *Offshore's* manufacturing reshoring to Norway. Referring to the situation when the firm decided to outsource production to China in 2008, the CEO explained that,

the market was also a bit different then. It allowed us to take the time to get products from China to Norway ... Before, we could allow ourselves to have a 26 weeks lead time. While in the economic climate that we have now [2018], the customers want to sit on their money for as long as possible ... That has led to us being asked to have 10–15 weeks lead time instead of 26, and then the China option falls away. (CEO, *Offshore*)

Insecurity, due to market risks, among *Offshore's* customers has led to demands for shorter lead times, which entails a shorter time-to-market (Coe and Yeung, 2015). With increased customer pressure on lead time, manufacturing in China became difficult and led *Offshore* to reshore its production to Norway.

In the automotive industry, time-to-market is a key factor and a driver for the regionalization of the industry (Dicken, 2015). This was an important aspect in the decision to reshore *Auto's* production to Norway: 'The automotive industry demands that you globalize and are close to the market' (CEO, *Auto*). The total cost of transporting parts from Europe to China and finished components back to Europe, combined with the ability to automate production (see Section 4.1), enabled *Auto* to build a new production site and reshore manufacturing to Norway. Proximity to markets (including B2B) is thus, in combination with other drivers, an important aspect in manufacturing reshoring, especially in the case of mass-produced products with relatively low margins, as transport costs can erode the comparative advantage of low production costs.

It is evident that there are many drivers for manufacturing reshoring to Norway. It is also evident that the reshoring of manufacturing to Norway is enabled by the combination of various factors, such as the implementation of new manufacturing technologies, the availability of key human capital, the presence of other region-specific competences, rather than stand-alone factors. In turn, these reshoring processes influence the configuration of global production networks.

4.4. Coupling dynamics in global production networks

Processes of reshoring imply reconfigurations of global production networks. These processes then have certain geographical outcomes. Reconfigurations of global production networks introduce dynamics into the framework and have been conceptualized as strategic coupling processes (Coe et al., 2004). A further distinction has been made between decoupling, coupling and recoupling processes, which in the GPN literature often are portrayed as definite ruptures (Coe and Yeung, 2015). However, in our empirical context, with a complex landscape of different sourcing strategies employed at different times, conceptualizations of abrupt strategic coupling processes (Coe and Yeung, 2015) do not provide sufficient analytical purchase. Due to acts of disinvestment taking place within some of the GPNs studied, the coupling processes have entailed a reconfiguration of the networks through locational shifts of value-added activity, rather than ruptures (MacKinnon, 2012). Disinvestments have been identified as an important mechanism within previous GPN studies (Werner, 2016), yet the implications of disinvestments for strategic coupling processes have not been properly developed in studies of GPNs. Therefore, in addition to providing illustrative examples of distinct decoupling and coupling processes (ruptures), we elaborate on *partial decoupling* and *partial recoupling* as refined analytical concepts.

Aqua and *Maritime* (see Table 2 for more details on reshoring processes) serve as illustrative examples of abrupt decoupling and coupling processes (Coe and Yeung, 2015). Due to advanced manufacturing technologies, *Aqua* outcompeted a Chinese manufacturer and became a key supplier for a Norwegian lead firm within the aquaculture industry. As the lead firm decided to source products from *Aqua* instead of from the foreign manufacturer, the foreign manufacturer was decoupled from the GPN and *Aqua* was coupled to the GPN. In a similar manner, due to product quality issues, *Maritime* (producing anchor winches for small vessels) reshored all of its production from China to Norway. The Chinese manufacturer was decoupled from the GPN, and *Maritime* was subsequently coupled to the GPN. In the following, we relate the processes of disinvestment and reinvestment to strategic coupling.

Similar to how Yeung and Coe (2015, 35) argue that outsourcing and subcontracting is an 'important capitalist dynamic' for lead firms to enhance value capture, we argue that this is also the case for suppliers within GPNs. These strategies entail a reconfiguration of the GPN through disinvestments (Werner, 2016) and reinvestments, which leads to processes of *partial decoupling* and *partial recoupling*. *Construction* and *Auto* serve as illustrative cases of such *partial coupling* processes. Due to a downturn in the pulp and paper industry in Norway, *Construction's* main market, and a simultaneous subsidization of that

industry in Poland (in addition to lower labour costs), the firm moved the majority of its production to Poland in the early 2000s. This resulted in the closure of a company branch plant in Norway, and the moving of some production to the company headquarters, while the rest was outsourced to a subcontractor in Poland. As *Construction* maintained some production at home while outsourcing the majority to Poland, the Norwegian production unit was never entirely decoupled from the global production network. However, the disinvestment process, in reducing the value-added activity, led to a *partial decoupling* of the home location from the GPN. Simultaneously, the Polish subcontractor was coupled to the GPN. In 2018, after investing in advanced manufacturing technologies (reinvestments) at the firm's headquarter, *Construction* reshored the majority of its production to Norway. Subsequently, the firm's home location increased its value-added activity and *partially* recoupled to the GPN. As some production remained abroad, the disinvestment in the offshore location entailed a partial decoupling of the Polish subcontractor. With the exception of the initial coupling of the Polish subcontractor, the GPN has not changed in terms of actors/firms/regions coupling to the production network. However, the GPN has undergone a series of reconfigurations through a series of disinvestments and reinvestments in the two regions. A similar story can be seen in the case of *Auto*.

In 2016, after initially locating production to its Chinese branch plant, the TNC owner of *Auto* decided to build a new factory with advanced manufacturing technology and to relocate the manufacturing of components for the European market to Norway. The relocation of production from a branch plant in China to Norway entailed a decoupling of the Chinese plant, as it was no longer part of the GPN serving the European market (it has continued production for the Asian market). The reinvestment in the Norwegian location resulted in an increase in the value added activity and a *partial* recoupling of *Auto* to the GPN. In this case, the GPN was changed in terms of the Chinese region being decoupled, and the Norwegian region gained more relevance in the GPN through reinvestments, thereby increasing its share of value added activity within the GPN.

The examples of *Construction* and *Auto* provide insights into how both lead firms and suppliers can enhance value capture (Coe and Yeung, 2015) through different modes of sourcing strategies. Furthermore, they provide empirical evidence for our more fine-grained conceptualization of *partial* coupling processes. Through disinvestments and reinvestments and subsequent *partial* decoupling and *partial* recoupling processes, with corresponding negative and positive regional economic outcomes, global production networks can be reconfigured with geographical shifts in value added activities and value capture.

4.5. The complexity of manufacturing reshoring

Our empirical findings mirror the heterogeneity of our case firms also in terms of their role and positioning in wider systems of production and consumption. This allowed for a broad exploratory analysis of the reshoring phenomenon, which has identified a range of drivers for reshoring, and opened up for a research agenda on reshoring within economic geography. Most of the drivers identified in this study are in line with previously identified drivers for reshoring, such as product quality issues, transportation costs and corrections of unforeseen costs related to offshoring and outsourcing. However, our empirical findings also suggest that automation and the implementation of advanced manufacturing technologies are key drivers for reshoring. In turn, the ability to implement such technologies is at least partly conditioned by existing, place-contingent regional assets and competences, developed on the cluster, regional or national level. As such, the study provides key insights into how the development of intra-firm and extra-firm capacities, such as key human resources, region-specific competence and a working life organization that promotes innovation, can enable reshoring. Whether or not these findings apply more broadly will require further research also in other contexts, applying both qualitative

and quantitative methods.

By studying both lead firms and specialized suppliers, which traditionally have been less studied actors within GPNs, this paper illustrates how reshoring provides a viable sourcing strategy for multiple types of actors within GPNs. The complex sourcing strategies employed by both suppliers and lead firms emphasizes how firms can adjust their value chains in order to maximize value capture. In turn, these adjustments entail reconfigurations of GPNs through distinct (ruptures) and *partial* coupling processes. These geographical shifts in value added activity underline the complexity and the functional fragmentation of manufacturing in the 21st century. Furthermore, they illustrate how firms' sourcing strategies have implications for the established spatial division of labour, as firms are able to relocate low value-added activities from low-cost to high-cost locations.

5. Conclusions

In this paper we have explored the drivers for reshoring in a high-cost context (Norway) and the applicability of the GPN framework for analysing the phenomenon. We consider that the GPN framework, through its multiscalar approach, provides a more holistic understanding of the reshoring phenomenon, and its influence on regional economic development, than previous firm-centric studies. The concept of cost-capability ratio (Coe and Yeung, 2015) provides analytical purchase in terms of explaining the development of firm-specific capacities such as investments in advanced manufacturing technology and improving firm knowledge, competence and knowledge relating to, for example, design for manufacturability. Furthermore, the reshoring phenomenon cannot be understood sufficiently without an explicit focus on firms' territorial embeddedness, both nationally and regionally. The case firms benefit from being embedded in certain regional contexts, as the societal and historical aspects of particular regions have enabled firms to harness regional assets, such as education and regional competence. However, reshoring is also influenced by extra-regional factors. Thus, market dynamics (Coe and Yeung, 2015) are important aspects in firms' reshoring decisions. Changes in the global economy result in changed customer demands, such as shorter time-to-market. The combination of intra-firm processes, especially the implementation of advanced manufacturing technologies, and extra-firm processes has enabled the studied manufacturers to reconstruct a comparative advantage in global manufacturing industries in their home locations. Overall, we consider that the GPN framework is suitable for studying the reshoring phenomenon. However, we suggest a few additions to the notion of strategic coupling.

In a complex economic landscape, with different sourcing strategies employed simultaneously, the conceptualization of coupling processes in the GPN framework as ruptures does not suffice. Therefore, we propose the conceptualization of *partial coupling processes* as expressions of disinvestments and reinvestments in manufacturing locations. *Partial decoupling* refers to disinvestments and subsequent reduced value capture in a host region, whereas *partial recoupling* refers to reinvestments that lead to an increase in value capture in a region, such as a home region. This provides a more fine-grained conceptualization of coupling processes. We find this is more in line with the many nuances of the spatio-functional divisions of labour within the global economy, and it provides a better understanding of GPN dynamics over time, including not least how GPNs 'touch down' in particular territories in particular ways over shorter or longer periods of time. As such, future GPN research should consider the adoption of an expansion of the strategic coupling concept. It is beyond the scope of this explorative paper to follow the developments of these partial coupling processes in our empirical analysis. However, we regard this as an important topic for future research within studies of GPNs and strategic coupling processes. An additional, and potentially related, topic for future research is how power relations between firms and within networks influence reshoring decisions, which could entail undertaking a more extensive approach

than what this paper has and e.g. study multiple actors within a global production network.

It appears that reshoring has yet to make any substantive impact in high-cost countries (e.g. the USA, Germany, the UK). In terms of policy, we argue that rather than implementing specific policies or policy instruments to facilitate reshoring, more generic innovation policies and tools focused on digitalization, robotization and skill upgrading might lead to an increase in the overall competitiveness and innovativeness, and thus stimulate manufacturing reshoring. Furthermore, and potentially more important in terms of value creation for the manufacturing industry in high-cost countries in general, such policies might make high-cost countries attractive host countries for manufacturing and retain some of the manufacturers that otherwise would outsource or offshore their production. Key dimensions could be variety in institutional contexts and varieties of capitalisms (i.e. differing set-ups of state-industry relations) and differences in national or regional innovation systems. While this issue is not developed further here, we consider it an important aspect of the reshoring phenomenon that demands empirical investigation in different national contexts.

CRedit authorship contribution statement

Henrik Brynthe Lund: Conceptualization, Methodology, Investigation, Writing - original draft, Writing - review & editing.
Markus Steen: Conceptualization, Methodology, Investigation, Writing - original draft, Writing - review & editing.

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