

Building Parallel Supply Chains: How the Manufacturing Location Decision Influences Supply Chain Ambidexterity

Hamid Moradlou ¹, Albachiara Boffelli ², Deodat Edward Mwesiumo,³
Amy Benstead,⁴ Samuel Roscoe ⁵ and Sanaa Khayyam²

¹Warwick Manufacturing Group, The University of Warwick, Coventry, CV4 7AL, UK, ²University of Bergamo, Via Salvecchio 19, Bergamo, 24129, Italy, ³Molde University College, Britvegen 2, Molde, NO-6410, Norway, ⁴University of Manchester, Oxford Road, Manchester, M13 9PL, UK, and ⁵Thompson Rivers University, 1 MG Road, Bengaluru, Karnataka, 560001, India

Corresponding author email: hamid.moradlou@warwick.ac.uk

The purpose of this paper is to examine how managers can develop ‘parallel’ supply chains to overcome the efficiency/flexibility trade-offs of offshored versus reshored/nearshored production. Primary evidence is gathered from 22 field interviews with eight companies from multiple countries, all operating in the textile and apparel industry. The interview data is triangulated using a cross-industry focus group with 28 participants and secondary sources including company annual reports and website information. The study contributes to organizational ambidexterity theory by identifying how companies embed structural ambidexterity in their supply chains, and in so doing create ‘parallel supply chains’. Our findings show that companies partition their production in terms of width (meaning that specific product lines were relocated) and depth (meaning that specific production activities were relocated). Companies then use a mix of offshored production facilities to manufacture low-margin, long-lead-time products as well as reshored/nearshored production facilities to make high-margin, quick-response items. The ability to swap production volumes between parallel supply chains enables supply chain ambidexterity, which in turn allows companies to exploit efficiency and flexibility benefits simultaneously. Managers are provided with an empirically informed, step-by-step framework for developing structural ambidexterity and building parallel supply chains.

Introduction

Prior to the Covid-19 pandemic, many transnational firms located manufacturing facilities, and sourced from suppliers, in low-wage economies to achieve cost efficiencies (Choudhary *et al.*, 2023). Global supply chains criss-crossed national boundaries, and when governments ordered businesses and borders to close during the pandemic, many supply chains ground to a halt (Verbeke, 2020; Wulandhari *et al.*, 2022). As a result, some companies decided to reshore or nearshore production facilities to avoid persistent disruptions, while ensuring greater flexibility and responsiveness to unpredictable spikes in supply and demand (Handfield, Graham and Burns, 2020; van Hoek, 2020). Proponents of nearshoring and reshoring argue that the costs of moving production back home can be offset by building

a supply chain that is more flexible/responsive to customer demand (Barbieri *et al.*, 2020; Gillani, Kutaula and Budhwar, 2022). Yet, the challenges of building a supply chain that is both cost-efficient and flexible can seem insurmountable. To find guidelines on how to create such a supply chain, managers can turn to organizational ambidexterity theory (March, 1991; O’Reilly and Tushman, 2013). This theory argues that by possessing an ambidexterity capability (Park, Pavlou and Saraf, 2020), organizations can pursue two conflicting goals (efficiency/flexibility) at the same time (March, 1991; O’Reilly and Tushman, 2013). Companies achieve this through structural partitioning, where dual organizational structures are established and certain sub-units concentrate on alignment (efficiency/exploitation) activities, while others focus on adaptation (flexibility/exploration) (Adler, Goldoftas and Levine, 1999).

The notion of structural partitioning can be extended to the supply, where a company would partition its product lines, as well as the supply chains that deliver these products to market, based on efficiency or flexibility requirements. For example, one supply chain might focus on exploiting its existing competencies by manufacturing commodity items in low-wage economies and bulk shipping goods to major centres of demand via sea or rail freight. Another supply chain might focus on exploring new opportunities by manufacturing customized products closer to major centres of demand and delivering them quickly to customers via air or road freight (Lee and Rha, 2016; Roscoe and Blome, 2019). An example is Zara, a company that has rapidly expanded its global operations by partitioning its supply chain as part of a 'dual-response' strategy. One supply chain is focused on efficiency, with low-cost operations in Asia making basic styles with stable demand. The other, quick-response supply chain focuses on making high-fashion items, with unpredictable demand, close to major demand centres in Spain, Portugal and Morocco (Financial Times, 2019). This is the idea of 'parallel supply chains', where companies segment product lines, the location of manufacturing and the mode of delivery, to create efficient and responsive supply chains that operate alongside one another. By implementing parallel supply chains, companies and their suppliers become ambidextrous because costs are minimized for particular product lines, while higher-margin items are delivered quickly to meet customer demand. Supply chain ambidexterity is defined as the ability to simultaneously pursue the seemingly conflicting goals of supply chain exploitation (efficiency) and exploration (flexibility) practices (Kristal, Huang and Roth, 2010, p. 415). Exploitation, in a supply chain context, refers to practices that leverage existing supply chain competencies to achieve lower costs and reliability (Kristal, Huang and Roth, 2010). Exploration, on the other hand, refers to 'practices that develop new supply chain competencies through experimentation and acquisition of new knowledge and resources' (Kristal, Huang and Roth, 2010).

The existing literature has explained how companies develop supply chain ambidexterity by building dynamic capabilities (Aslam *et al.*, 2018; Lee and Rha, 2016) or by balancing exploration and exploitation activities in the purchasing (Gualandris, Legenvre and Kalchschmidt, 2018) and manufacturing function (Tamayo-Torres, Roehrich and Lewis, 2017). Other studies have put forward conceptual models on how emerging technologies (3D printing) can enable ambidextrous supply chains (Roscoe and Blome, 2019). While intriguing, there is limited empirical evidence on how companies can use structural partitioning to create parallel supply chains, and the benefits inherent in doing so. Moreover, the role of the manufacturing location decision in the development of parallel supply chains

has yet to be explored. This omission is worth studying because, since the pandemic, some companies are fully reshoring/nearshoring production and supply, some are keeping parts of their production offshored, while others are following a hybrid approach. What remains unclear is how companies actually establish parallel supply chains in practice.

The aim of this paper is to determine how firms can achieve supply chain structural ambidexterity and realize the purported benefits of parallel supply chains. To achieve this aim, the paper sets out to answer the following research questions:

- RQ1:* How can the manufacturing location decision support the development of structural ambidexterity in the supply chain?
- RQ2:* To what degree does supply chain structural ambidexterity provide firms with efficiency and flexibility benefits?

We examine these questions through the lens of organizational ambidexterity theory (March, 1991; O'Reilly and Tushman, 2013). Empirical evidence is gathered from eight companies in the apparel and textile industry, selected because of their use of parallel supply chains to deliver both standardized and customized products to customers. Twenty-two semi-structured interviews were conducted with supply chain managers working for apparel companies based in the United Kingdom, Norway and Italy. The interview findings are triangulated using secondary documentation (annual reports, website information and newspaper reports) as well as a practitioner-based focus group.

Evidence is presented on how companies segmented their product lines, in terms of width (meaning that specific product lines were relocated) and in terms of depth (meaning that specific production activities were relocated). These companies established a combination of reshored/nearshored and offshored production facilities and sources of supply to create parallel supply chains. Based on these findings, we develop a managerial framework that depicts an evolving process, where companies continue to exploit existing efficiencies in the manufacturing process, while seeking new knowledge from suppliers' closer-to-home markets. Our framework guides managers on how to embed ambidexterity in the supply chain by building surge capacity into offshored and reshored production facilities. A company's ability to swap production volumes between manufacturing locations helped to embed ambidexterity into the supply chain and granted efficiency and flexibility benefits.

The next section provides an overview of organizational ambidexterity theory, supply chain ambidexterity and the manufacturing location decision literature. The third section provides the choices and relative justifications for the research design. The fourth section presents

the findings, while the fifth section compares the findings to the existing literature to derive four theoretically informed propositions. The final section highlights the study's contribution to theory and practice, its limitations and avenues for future research.

Literature review and theoretical underpinnings

Organizational ambidexterity theory

Organizational ambidexterity theory is rooted in the notion that both exploration and exploitation activities are essential for organizational survival; however, the two practices compete for scarce resources (March, 1991; Nielsen, Mathiassen and Hansen, 2018). Exploration refers to the search for innovative new ideas, experimentation, flexibility and discovery, while exploitation refers to efficiency, continuous improvement and execution of ideas (March, 1991). The theory argues that adaptive systems that engage in exploration, to the exclusion of exploitation, are likely to suffer the costs of experimentation without gaining its benefits, while those that engage in exploitation to the exclusion of exploration are likely to find themselves trapped in a sub-optimal stable equilibrium (March, 1991). Therefore, maintaining an appropriate balance between exploration and exploitation is essential for system survival and prosperity (Kassotaki, 2022). As organizations learn from experience how to divide resources between exploitation and exploration, the distribution of consequences across time and space affects the lessons learned (Kassotaki, 2022).

Organizations that are able to balance the trade-offs between exploration (flexibility) and exploitation (efficiency) are said to be ambidextrous (Nielsen, Mathiassen and Hansen, 2018; Roscoe and Blome, 2019). Organizational ambidexterity can be achieved through the switching of job roles and the partitioning of organizational structures (Adler, Goldoftas and Levine, 1999). Work is organized so that people switch sequentially between exploration (search, research and development) and exploitation tasks (production, transportation) (Adler, Goldoftas and Levine, 1999). Switching can also be supported by creating 'parallel' organizational structures (Birkinshaw and Gupta, 2013; Gibson and Birkinshaw, 2004), which encourages workers to move between a bureaucratic structure for routine tasks and a more organic structure for non-routine tasks. Partitioning can enhance flexibility without a significant loss of efficiency when the differentiated sub-units coordinate and integrate their efforts. Organizational ambidexterity allows companies to be both efficient in the management of daily business activities and responsive enough to changes in the business environment and disruptions leading to enhanced operational performance (Kassotaki, 2022).

Supply chain ambidexterity

As with internal organizational functions, the different activities and processes of a supply chain can be divided to focus on exploitation (efficient) or exploration (flexible) tasks (Kristal, Huang and Roth, 2010). For example, a study by Roscoe and Blome (2019) explained how companies can structurally partition the supply chain by exploiting the efficiency of manufacturing in high volumes in a centralized, offshored, manufacturing facility while using emerging technologies (3D printing) to manufacture personalized medicines closer to the point of use. Another study by Gualandris, Legenvre and Kalchschmidt (2018) explored how firms can balance and combine exploratory and exploitative activities in the purchasing function in order to match the dynamism of their external environment. Other scholars argue that firms can have both a flexible and an efficient supply chain when underpinned by the dynamic supply chain capabilities of market sensing (search), supply chain agility and adaptability (Aslam *et al.*, 2018, 2020). Supply chain ambidexterity is said to enhance manufacturing performance by allowing managers to effectively manage the operational trade-offs of quality, speed, flexibility and cost dimensions (Tamayo-Torres, Roehrich and Lewis, 2017). Blome, Schoenherr and Rexhausen (2013) point to relational and contractual governance modes as ways of creating efficiency and flexibility in the supply chain, and identify positive effects on innovation and cost performance. Another, relevant study on the Covid-19 pandemic by McMaster *et al.* (2020) finds that focusing on cost reduction through an efficient supply chain tends to significantly reduce transparency and results in widespread backlash for many firms, whereas agile approaches address this inflexibility by taking inherent uncertainty into account.

While the literature on supply chain ambidexterity is increasing, its focus is typically on the efficiency/responsiveness trade-offs of a stand-alone, discrete, supply chain. The notion of creating dual structures in supply chains has received limited attention. At the same time, the ways in which the manufacturing location decision can support supply chain ambidexterity remains an under-researched topic. We address this knowledge gap by examining how the manufacturing location decision affects the efficiency/flexibility mix in a firm's supply chain.

The manufacturing relocation decision

The manufacturing location decision is made along two dimensions: geographical location and governance mode (Gray *et al.*, 2013; Moradlou *et al.*, 2021). The decision on where to geographically locate production and supply takes the focal firm's headquarters as its reference point and seeks to modify the country of destination of

a previously offshored investment (Barbieri *et al.*, 2020). In particular, offshoring is the starting point of the relocation process and refers to the movement of a business process performed by a company in the home country to the same company in another country (Ellram, Tate and Billington, 2008). Traditionally, the primary motivation for offshoring is cost efficiencies that are achieved by exploiting low labour costs in emerging markets, reducing barriers to trade and accessing economies of scale as components and final products are produced in large, centralized facilities and subsequently shipped to customers around the globe (Ellram, Tate and Petersen, 2013).

Reshoring refers to the partial/total relocation of production and supply to the country where the company is headquartered, to service local, regional or global demands (Fratocchi *et al.*, 2014). The decision to reshore production is typically driven by the risks inherent in long, globalized supply chains as well as a business need to be more responsive to demand in home markets (Benstead, Stevenson and Hendry, 2017; Choudhary *et al.*, 2023; Moradlou, Backhouse and Ranganathan, 2017). By being close to major centres of demand, reshored production facilities are less exposed to the vulnerabilities of global supply chains including port closures, climate risks and geopolitical disruptions (Dey *et al.*, 2022; Gupta, Wang and Czinkota, 2021). Baraldi *et al.* (2018) introduce the term 'selective reshoring' to indicate that there are degrees of reshoring, moving across a spectrum from all production being located overseas to all production being relocated to the home country. Building on this idea, Fratocchi and Di Stefano (2019) further distinguish between two types of selectivity when reshoring: in terms of width, when only some product lines (e.g. only high-end products) are reshored; and in terms of depth, when only some production phases (e.g. only the assembly activities) are reshored (Di Stefano, Fratocchi and Merino, 2018). Some scholars have suggested that the Covid-19 pandemic has led to a resurrection of localized modes of production with a significant proportion of manufacturing, once located in China, moving back to the United States and Europe (Handfield, Graham and Burns, 2020; van Hoek, 2020).

Nearshoring refers to the relocation of production and supply to a country nearby where the focal firm is headquartered (Piatanesi and Arauzo-Carod, 2019). The primary motivation behind nearshoring is to gain the lower-wage advantages of operating in countries close to major centres of demand (i.e. Mexico for the United States), while maintaining shorter supply chains that can quickly respond to demand spikes. Foroudi *et al.* (2022) cite a survey of 1200 multinationals based in the United States, United Kingdom, France, Germany and Italy, and find that less than 15% would consider reshoring, while roughly 50% would relocate some plants to neighbouring countries due to the dual cost

savings and flexibility advantages that nearshoring has to offer.

The second dimension of the manufacturing location decision is the governance mode; or the decision on whether to outsource production or perform the activity in-house (Ellram, Tate and Billington, 2008; Gray *et al.*, 2013). This aspect of selecting a manufacturing location is rooted in the 'make-or-buy' decision, where a company's strategic competencies are kept in-house and the non-strategically important activities are outsourced (Medina-Serrano *et al.*, 2020). While this creates a myriad of options such as offshored outsourcing and nearshored insourcing, Gray *et al.* (2013) remind us that governance mode is actually related to ownership choice, as opposed to the manufacturing location decision. As such, this paper focuses on the geographical location, as opposed to ownership aspects of the manufacturing location decision. In particular, this study aims to fill a gap in our collective knowledge about how the manufacturing location decision affects a firm's ability to embed ambidexterity in the supply chain and create parallel supply chains that are both flexible and efficient. Table 1 further highlights this gap in the literature since none of the studies below investigate the role of manufacturing location decisions.

Methodology

Research design

The research design is based on a theory elaboration approach, which refers to the development of new theoretical insights by contrasting, specifying or structuring theoretical constructs and relations to account for and explain empirical observations (Fisher and Aguinis, 2017, p. 438). Working abductively, we compared the empirical evidence to organizational ambidexterity theory and, when new concepts and relationships were identified, we elaborated on the existing theory in an effort to achieve broader theoretical generalizations from the findings (Ketokivi and Choi, 2014; Yin, 2014). The study was grounded in the context of companies relocating production facilities, product lines and sources of supply, before and during the Covid-19 pandemic. Our unit of analysis is the manufacturing relocation decision.

Empirical evidence was collected from eight companies from the textile and apparel manufacturing industry – selected because it is a sector characterized by globalized supply chains that produce both commodity-type products, requiring an efficient supply chain approach, and high-end fashion products, requiring greater responsiveness and flexibility, thus reflecting the need for ambidexterity. A cross-company comparison was used to provide depth, in terms of within-company analysis, as well as breadth, in terms of cross-company analy-

Table 1. Gaps in the literature

| | Adler, Goldoftas and Levine (1999) | Gibson and Birkinshaw (2004) | Patel, Terjesen and Li (2012) | Lee and Rha (2016) | Tamayo-Torres, Roehrich and Lewis (2017) | Aslam et al. (2018) | Gualandris, Legenvre and Kaltschmidt (2018) | Roscoe and Blome (2019) | Bettiol et al. (2023) | This research |
|---|--|--|---|--|---|---|---|--|---|--|
| Theoretical lens | Organization theory | Leadership and organization | Absorptive capacity and ambidexterity theories | Dynamic capability | Organizational ambidexterity | Dynamic capabilities | Ambidexterity theory | Organizational ambidexterity | Exploration and exploitation | Organizational ambidexterity |
| Methodology | Case study | Survey study | Survey study | Field survey | Structural equation modelling | Structural equation modelling | Survey study | Case study | Case study | Field interviews |
| Objectives | Reconceptualize the relationship between flexibility and efficiency | Simultaneously achieve alignment and adaptability at a business-unit level | Explore the learning capabilities that moderate the environmental uncertainty—manufacturing flexibility—performance relationship | Examine organizational ambidexterity as a mitigation strategy for supply chain disruptions | Examine the relationship between organizational ambidexterity and manufacturing performance | Understand how dynamic supply chain capabilities interrelate and affect supply chain ambidexterity | Introduce and define the concept of purchasing ambidexterity | Extend operations strategy theory on efficiency and flexibility | Study how ambidexterity could allow SMEs to strategically respond to the pandemic-related crisis | Examine how managers can develop 'parallel' supply chains to overcome the efficiency/flexibility trade-offs of offshored versus reshored/nearshored production |
| Key findings | Production can be simultaneously efficient and flexible if the organization partitions itself to allow certain sub-units to specialize in routine tasks whilst the other sub-units specialize in non-routine tasks | Organizations should structurally empower employees to make their own choices as to how they divide their time between alignment (efficient) and adaptability-oriented (flexible) activities | Organizations with higher operational ambidexterity capabilities tend to better respond to demand as well as technical and competitive uncertainty due to manufacturing flexibility | Supply chain ambidexterity further enhances manufacturing performance and allows mitigation of the negative impact of supply chain disruptions | There is a significant relationship between ambidexterity as the basis and enabler for manufacturing performance improvements | Supply chain agility mediates the relationship between supply chain adaptability and supply chain ambidexterity | Firms can balance and combine explorative and exploitative activities in the purchasing function in order to match the dynamism of their external environment | Large firms can structurally partition their manufacturing and supply management functions, with one sub-unit managing centralized production and the other redistributing manufacturing | Organizations can benefit from multiple locations and reacted to the pandemic by using company sites to be closer to their customers at their specific location | Companies can then use a mix of offshored production facilities to manufacture products as well as reshored/nearshored production facilities to make high-margin, quick-response items, which in turn allows companies to exploit efficiency and flexibility benefits simultaneously |
| Organizational ambidexterity | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Structural ambidexterity | Yes | Yes | No | No | No | No | Yes | Yes | Yes | Yes |
| Ambidexterity through manufacturing location decision | No | No | No | No | No | No | No | Yes | Yes | Yes |
| Ambidexterity through offshoring and nearshoring | No | No | No | No | No | No | No | No | No | Yes |

sis. Regarding company selection, we applied purposeful sampling, selecting companies that could provide an in-depth understanding of the subject matter (Dubois and Araujo, 2007). Companies were selected according to whether they had relocated production facilities, product lines or sources of supply from a previously offshored position to a country where their headquarters were located, while still maintaining the offshore presence, reflecting a type of ambidexterity capability (Table 2).

Following a replication logic (Yin, 2014), we looked for firms headquartered in countries with strong apparel and textile industries, and found three countries to have particularly strong apparel and textile sectors – Italy, Norway and the United Kingdom. According to Ngai *et al.* (2014), the textile and apparel supply chain can be divided into three sectors: textile production, apparel manufacture and distribution/sales. We focus on the first two parts of the supply chain, that is, textile production and apparel manufacture, as these areas are relevant to the manufacturing location decision, which is our unit of analysis.

Data collection

Data collection was based on a triangulation strategy (Yin, 2014) including primary data gathered from 22 field interviews, a focus group and secondary documentation gathered from company annual reports and websites. A total of nine interviews were conducted face-to-face, and 13 were conducted online, both prior to and after the pandemic start. We identified interview informants by selecting senior-level managers with at least three years' experience in their current role. The majority of respondents had more than 10 years' experience in various roles at their company. Due to their seniority and experience, the respondents had a high level of understanding of the relocation of production facilities and suppliers. Each interview lasted between 45 minutes and 1.5 hours. Interviews were conducted in the native language of the company headquarters (Italian, Norwegian or English). If not conducted in English, the interviews were recorded and transcribed verbatim and translated. The interview protocol used for data collection was developed primarily based on the literature review and research gap, and was informed by our initial conversations with the case companies (see Appendix 1).

The preliminary results from the interviews were further validated using a focus group that consisted of 28 experienced practitioners from a wide range of industries (Table 3) (Wilkinson, 2004). The purpose of the focus group was to present the outcomes of the interviews and assess the generalizability of the findings. The focus group was conducted online as part of an all-day event that was scheduled at quarterly intervals for industry members of a research club at a leading UK uni-

versity. Four members of the research team participated in the focus group sessions, each facilitating and capturing discussions using the breakout room function of the Zoom software. The theme of the meeting was 'Impacts of global pandemics on supply chains', which hence supported the focus group discussion topic. Drawing upon cross-sectoral expertise, we were able to evaluate the results and discuss our propositions. Any counter-arguments were captured and findings were adjusted. During the focus group, the consensus on the interview findings was discussed with the focus group participants, which allowed us to corroborate, challenge and confirm the responses.

The primary evidence was triangulated with secondary documentation gathered from company annual reports, company websites, newspapers and news databases, including Factiva, Bloomberg and Reuters. This provided important corroboratory evidence on the location of new facilities, and the product lines that were relocated.

Data analysis

The interview and focus group data were analysed using thematic analysis techniques (Braun and Clarke, 2006). 26 hours of interview recordings were collected and transcribed verbatim, resulting in 120 pages of typed transcripts. Interview data was analysed firstly within the company and then compared across the companies, using NVivo 11 software. During the thematic analysis, a pattern-matching logic was adopted to code the data, with similar passages of text grouped together into codes and then appended to themes (Yin, 2014). When passages of text were identified that did not easily fit the coding scheme, the authors assigned a new coding category and affixed them to a new theme. To enhance inter-rater reliability, a second member of the research team repeated the pattern-matching process (Armstrong *et al.*, 1997). The coding scheme was compared between the members of the research team and altered in an iterative fashion until consensus was reached on the key themes to emerge from the data (Braun and Clarke, 2006). The coding template was revised until the research team arrived at a final template that provided a robust explanation of the findings (Eisenhardt and Graebner, 2007). The secondary documentation was analysed using content analysis techniques (Krippendorff, 2012). To enhance the reliability of the findings, the research team established a chain of evidence, including a case study protocol that meticulously documented the steps taken during the data collection and analysis process. After the thematic analysis, the results were presented to a cross-sectoral audience during a focus group event. Although the findings were based on the textile industry, there was consensus across various sectors on the applicability of the main findings in

Table 2. Company information

| Company | Country | Size | Number of interviews | Areas of operation | Interviewee position(s) | Number of years experience in company | Revenue | Offshoring destination | Relocation destination | Year of relocation |
|----------|-------------------|-------|----------------------|--------------------|---|---------------------------------------|---------------------|---|------------------------|--------------------|
| Company1 | Italy | Large | 2 3 | Outerwear | CEO International Division Manager | 45 13 | 28 million EUR | Romania | Italy | 2014 |
| Company2 | Italy | Large | 3 | Sportswear | CEO | 14 | 179 million EUR | China, Turkey, Eastern Europe | Italy | 2014 |
| Company3 | Italy | SME | 3 | Textile | CEO | 22 | 2 million EUR | China | Italy | 2010 |
| Company4 | Italy | SME | 2 | Textile | Member of the Board of Directors | 30 | 7 million EUR | China Hungary | Italy | 2011 |
| Company5 | Norway | Large | 2 | Outwear | Production Manager | 16 | 27 million EUR | China | Lithuania | 2015 |
| Company6 | Norway | Large | 2 | Outwear | Supply Chain Manager | 9 | 65.5 million EUR | China | Lithuania | 2020 |
| Company7 | United Kingdom | SME | 3 | Textile | CEO | 30 | 8 million GBP | China | United Kingdom | 2012 |
| Company8 | United Kingdom | Large | 2 | Fast Fashion | Marketing Manager Deputy Head of Buying | 15 7 | 202 million GBP | China, Pakistan, Bangladesh, India | United Kingdom | 2019 |

Table 3. Focus group characteristics

| Characteristics | Rationale/aims/outcomes |
|---|---|
| <ul style="list-style-type: none"> Participants: 28 Companies represented: 13 Duration: 1 hour Researchers for data collection: 5 Industries represented by participants: automotive, food, logistics, consulting, FMCG manufacturing, retail, fashion, aerospace, utilities, healthcare, banking Supply chain experience of participants: 5–40 years | <ul style="list-style-type: none"> Evaluation of the results Confirmation of the four propositions Focus on items that were contradicting the results Elaboration of applicability of findings to different scenarios (industry/supply chain) Identification and capturing additional comments |

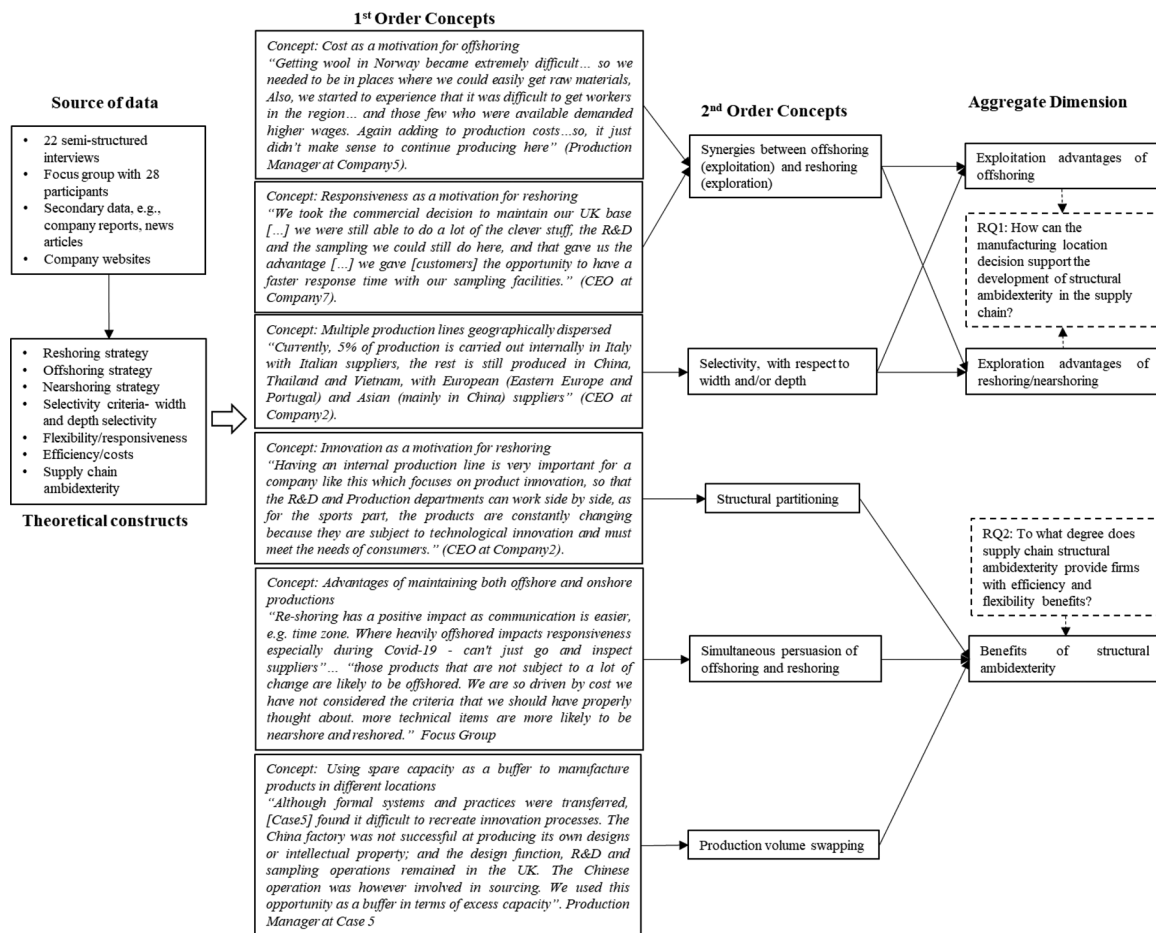


Figure 1. Data coding tree

different contexts. Figure 1 presents a data coding tree that shows the data sources and theoretical constructs. It also illustrates the hierarchy of concepts and the connection from one hierarchy to the next by linking the transcribed text to second-order concept and aggregate dimensions. The first-order coding identifies and categorizes data based on theoretical constructs, while emerging themes are based on the patterns in the data. Then each aggregate dimension is linked to a research question.

Findings

Exploitation advantages of offshoring

The findings suggest that, at one point in time, all the companies in our study had followed an offshoring strategy to achieve efficiency advantages for low labour costs and/or to remain competitive with other companies that had previously offshored. For example, the production manager at Company5 explained how the high cost of production in Norway was the initial rea-

son for his company offshoring production to China in the early 2000s: '[The] cost of production became very high and it was no longer possible for us to compete. Actually, in 2002, we went bankrupt, and moving production to a low-cost country was the only way we could stay in business.' The CEO of Company7 expands on the cost drivers to offshore production as follows: 'Chinese selling prices were cheaper than our cost prices' and this was attributed to the favourable exchange rate that meant China-made products were inexpensive, making it difficult for UK production to compete. As a result, Company7 decided to conduct an offshoring trial to assess the feasibility of shifting its production to China, which was later developed into a joint venture with a Chinese company.

Interviewees explained that the significant cost differentials between Western and low-cost countries stem from access to cheap labour and raw materials, lower energy costs and government incentives in the host countries. For instance, the limited supply of raw materials in Western countries was mentioned as an issue by the Production Manager at Company5, as follows:

Getting wool in Norway became extremely difficult... so we needed to be in places where we could easily get raw materials. Also, we started to experience that it was difficult to get workers in the region... and those few who were available demanded higher wages. Again adding to production costs... so, it just didn't make sense to continue producing here. (Production Manager at Company5)

The preceding quotes stress that the efficiency advantages of greater access to human capital and material inputs in low-wage economies was the biggest contributing factor behind offshoring at the time. In addition to the cost of production, the shift in knowledge and expertise to other geographical locations such as China, Turkey and other Eastern European countries was a contributing factor in the offshoring decision. Whilst interviewees admitted that dealing with offshored suppliers can reduce the visibility/transparency in their supply chain, they explained how efficiency improvements achieved due to the offshoring decision are still a significant part of the companies' decision-making process:

Currently, 5% of production is carried out internally in Italy with Italian suppliers, the rest is still produced in China, Thailand and Vietnam, with European (Eastern Europe and Portugal) and Asian (mainly in China) suppliers. (CEO at Company2)

The above findings were further validated by other industry sectors during the focus group discussion. In contrast to the cost and efficiency motivations for offshoring, the respondents explained how their reshoring and nearshoring decisions were predominantly focused on enhancing the responsiveness and flexibility of their supply chain and operations.

Exploration advantages of reshoring/nearshoring

All of the companies in our study engaged in a partial or complete relocation of production and/or supply, either before or during the Covid-19 pandemic. The relocation decision was related to the physical movement of facilities to a nearshored or onshored location. During the data analysis process, it emerged that the primary motivations behind the partial relocation of production related to the exploration aspects of ambidexterity. Specifically, informants explained that they were motivated by being quicker to market and more responsive to demand, as well as searching for new sources of knowledge and expertise in home markets. The Deputy Head of Buying at Company8 claimed:

We are reactive and fast. A lot of our business is now UK-based, which offers speed... It is about demand, if there is demand for a particular colourway and we need it fast and we have missed it with our programme in Pakistan, that is where the United Kingdom will serve it. (Deputy Head of Buying at Company8)

Due to supply issues with offshoring during the pandemic, Company8 had to try and source woven product (a material input not readily available locally) from the United Kingdom. After significant search activities, Company8 managed to find a local UK factory, who they worked with to meet their product requirements. This new opportunity was referred to as 'invaluable' by the CEO, and the local supplier is now considered of strategic importance in new product development efforts. Similarly, the CEO at Company2 explained his company's reasoning behind partially relocating production during Covid-19 as follows:

Reshoring or proximity sourcing substantially cut lead time, the time elapsed between the product idea and when the product arrives on the store shelf or via e-commerce. The market is changing, not only from the explosion of e-commerce, so the lead time required is ever shorter. It is 40 days by ship [from China], but from another Italian manufacturer half a day by truck, while from another European manufacturer a couple of days of transport, so it changes a lot. (CEO at Company2)

Importantly, this respondent explained how his company segmented its product line, and subsequently partitioned its supply chain to deliver the different product types. For example, his company moved the manufacturing of high-end products to Italy (5% of production), while leaving the rest of production in China:

It allows a segmentation of the product, also offers more refined lines with an ease in segmenting the distribution of the products themselves. An Italian or proximity production also shelters from geopolitical storms rather than storms like today's that hit the logistics part: if they block production in a country and block it even in Italy, little

change is noticed. The problem is noticed when reopening; they form logistical funnels that extend previous lead times required with exploding costs. (CEO at Company2)

The Production Manager at Company6 explained how his company followed a similar approach to product-line segmentation. The company allocated the production of low-cost standardized apparel to an off-shored facility in China and nearshored the production of high-end fashion products to a location in Lithuania:

Currently, about 75% of our production is in Asia, mainly China. 25% is in Europe. We have just built our factory in Lithuania, which opened in March 2020, just around the lockdown in Norway. We are in a phase where we are moving more and more from Asia to Europe. The idea is not that we will produce everything we have in the collection, but we will produce all the high-end products here in Europe and keep the rest – standard items – in Asia. (Supply Chain Manager at Company6)

Product segmentation is also evident in Company8, where UK-based suppliers are used for quick-to-market products such as mini dresses, coats, leggings, cropped tops for active wear; all trendy products linked to celebrities. For other basic products, such as jogging pants or hoodies, where the cut and product design does not change significantly, suppliers from Pakistan and Bangladesh are mainly used. The CEO at Company1 explained how selective reshoring provided proximity to his end customers, resulting in a significant reduction in delivery lead time. He discussed his company's close collaboration with their major supplier Prada during the pandemic as follows:

We worked with our customer directly for their productions without going through Italy. With the advent of the pandemic, Prada required us to develop sample prototypes directly here in Italy, because there was the period for the technicians to be able to move initially to Romania, for their made-in-Europe and non-made-in-Europe lines. Since we were already collaborating in Romania, some of their technicians are between Milan and Bergamo, they took the opportunity and came here directly to Silusi to sample. From May to October 2020 almost every day we had 2 Prada technicians for the development of new products, new tests, small samples, samples. I have to say this has helped us a lot with important client. (CEO at Company1)

Whilst these aforementioned companies selectively reshored their production and supply, the Production Manager at Company5 explained how his company nearshored parts of their production activities from China to Lithuania during the Covid-19 pandemic, while keeping the production of low-margin, long-lead-time, products in China. Similarly to the earlier reshoring strategies, nearshoring allowed Company5 to be more flexible to changes in the market and consider-

ably cut down the lead time. Importantly, the move to Lithuania allowed Company5 to increase and decrease its production and accommodate any volume swapping, depending on fluctuations in supply and demand during the pandemic:

Since our primary market is Norway, having production in China or any Asian country made it difficult for us to respond to changes in demand. But Lithuania is in the middle of the European market with a short distance to the head office in Norway... It makes logistics and communication more efficient. It takes only two days to send a truck from Lithuania to Norway... The total lead time of the production plant is five days +/- one day. The production process can be restructured quickly... A telephone call from the logistics manager in Norway to the plant may stop, change or increase production... The production plant is also flexible in that they can produce in relatively small, specialized quantity and in large quantity. (Production Manager at Company5)

This nearshoring and flexible production strategy allowed Company5 to minimize the demand and supply-side impacts of Covid-19, while its competitors were severely hit by the impacts of lockdowns and closed borders in China. The Production Manager went on to explain how their nearshoring approach gave his company a point of strategic differentiation in the market:

Most of our direct competitors are producing in Asia, during [the] pandemic, they struggled with deliveries. But, that was not a problem for us because we continued with production, and the border in Norway has been open for trucks. As it takes only two days to send a truck from Lithuania to Norway, this meant that we could easily respond to the gap left by our competitors. Most of our competitors have been talking about bringing production back to Europe in the last 5–6 years, but they have been slow to act. We realized that this is not just about cutting costs, but sustainability, flexibility and quality are also important for us. (Production Manager at Company5)

Respondents discussed another important factor in the exploration dimension of ambidexterity – innovation. Interviewees explained how reshoring provided proximity to a new supply base in the home country and increased opportunities for engagement with suppliers to collaborate on new products and technology development activities. The CEO at Company7 explained how reshoring opened up opportunities to collaborate with UK customers/suppliers on research and development efforts:

We took the commercial decision to maintain our UK base [...] we were still able to do a lot of the clever stuff, the R&D and the sampling we could still do here, and that gave us the advantage [...] we gave [customers] the opportunity to have

a faster response time with our sampling facilities. (CEO at Company7)

Similarly, the CEO at Company2 explained how his company undertook exploration activities at their reshored facility as they had access to highly knowledgeable supplier teams as well as technical expertise from local staff. This permitted buyer–supplier collaboration on new product and technology development projects at the reshored facility:

Having an internal production line is very important for a company like this which focuses on product innovation, so that the Research & Development and Production departments can work side by side, as for the sports part, the products are constantly changing because they are subject to technological innovation and must meet the needs of consumers. (CEO at Company2)

These quotes show how the companies adopted both hybrid offshoring and reshoring/nearshoring strategies simultaneously to benefit from exploration and exploitation advantages. To do so, the companies in our study partitioned their supply chains where cost-sensitive product lines are manufactured offshore to capitalize on efficiency benefits, while the supply and production of time-sensitive products were moved closer to the home country. The benefits of structurally partitioning the supply chain were discussed by the CEO of Company1 as follows:

Currently we have seen that we have moments in which production, especially in the face of special requests, must be ‘buffered’ thanks to Italian production, so our philosophy will remain part Italian and part Romania. That is, more precisely, this return to Italy alongside production in Romania. (CEO at Company1)

The CEO of Company2 also perceived the manufacturing location decision as a dynamic set of strategies that needed to be continuously re-evaluated and examined to ensure fit with a constantly changing external business environment. Interviewees stressed how reshoring was not a final decision, and that it is important to constantly re-evaluate the shoring location, and to build capability to shift/change location:

The reshoring process, as in general the process of geographic localization of the operations and sourcing, is continuous, because the structure of the company, the needs, the distribution structure as well as the situation of the sourcing in the world continuously change: markets that open, sources that open and sources that close. (CEO at Company2)

Benefits of structural ambidexterity

Table 4 provides a cross-company comparison between various outcomes of both offshoring and

reshoring/nearshoring decisions. In accordance with Fratocchi and Di Stefano (2019), we have differentiated the selectivity of the location decision in terms of width (all products vs. some products) and in terms of depth (entire production phases vs. parts of production phases). Our findings show that the majority of the offshoring decisions, five out of eight cases, were made with ‘no selectivity’ of product lines or production activities, meaning all manufacturing was relocated to a low-cost country without any particular segmentation. The remaining three cases only offshored the low-cost items, primarily targeting to move low-skilled jobs to developing countries, also depicted by the so-called ‘smile curve’ (Mudambi, 2008).

On the other hand, in terms of reshoring decisions, four companies partially repatriated production in terms of width, whereas two companies reshored in terms of both width and depth, and only one company brought all production back home. The cross-company comparison indicates that product segmentation mainly took place in terms of high-quality/high-end products, and short product lifecycle products versus basic low-cost items. This strategy helped companies to be more flexible and responsive to the supply chain disruptions by allowing better supplier communications, reduced lead time, increased product innovation, co-location of design and production, and better customization of finished goods.

Discussion

Our empirical evidence suggests that, despite significant supply chain disruptions such as Covid-19, the offshoring strategy remains a viable option for many companies today, especially for cost-sensitive products. This finding supports Barbieri *et al.* (2020), who argued that Covid-19 will not render offshoring out-of-date or invalidate the theoretical lenses that we have used in the last 50 years. Hence companies who engage in offshoring continue to benefit from exploitation by accessing low-cost labour and material inputs. Despite its critics (Sarkis, 2020; Van Hoek, 2020), offshoring continues to be an effective option for low-cost products that experience limited demand fluctuation.

At the same time, Ellram, Tate and Petersen (2013) argue that excessive offshoring can lead to a lack of transparency which impacts both supply chain flexibility and responsiveness capabilities. This finding was supported by the CEO at Company2, who mentioned that while offshoring allowed his company to be cost competitive, it also meant they lost visibility of manufacturing activities underway at suppliers in China. Hilletofth *et al.* (2019) suggest that companies should not only focus on offshoring or reshoring, but instead find the most appropriate balance by continuously revising their

Table 4. Cross-company comparison

| Cross-company comparison | Pseudonym | Offshored production/suppliers | | Reshored production/suppliers | |
|--------------------------|-----------|--|---|--|--|
| | | Selectivity | Outcome | Selectivity | Outcome |
| Italy | Company1 | No selectivity. All production (design and prototyping kept in Italy) | Reduced labour and production costs | Width selectivity. Small batches of high-quality and technical products | Flexibility in terms of production volumes, technologies and materials |
| Italy | Company2 | No selectivity. All production (design kept in Italy) | Reduced production costs | Width selectivity. High-end products are produced in Italy (5% of production) | Reduced time to market. Process and product innovation. Reputation advantage |
| Italy | Company3 | No selectivity. All production (storage kept in Italy) | Reduced production costs | Width and depth selectivity. High-end items produced in Italy, but components bought in China (lack of suppliers' availability) | Higher quality. Customization opportunities. Shorter delivery times. Reduced logistics costs |
| Italy | Company4 | Width selectivity. Lower-cost items (e.g. thick coloured yarns) | Reduced production costs | No selectivity. All production brought back (some production phases dismissed) | Higher responsiveness. Higher customer loyalty |
| Norway | Company5 | No selectivity. All production | Reduced production costs. Uncertain quality | Width and depth selectivity. Spinning for regular products still done in China, and for high-end products in the United Kingdom | Increased response to market changes. Increased compliance to sustainability requirements |
| Norway | Company6 | No selectivity. All production (design, prototyping and testing kept in Norway) | Reduced production costs | Width selectivity. Only high-end products (25% of production) | Increased response to demand. No significant change in production costs |
| United Kingdom | Company7 | Width selectivity. Lower-cost items (higher-value products remained in the United Kingdom, as well as design and prototyping) | Reduced production costs | Width and depth selectivity. Price points: mid/high range produced in the United Kingdom; lower range remains in China. Market segmentation: production of products to serve the Eastern market including Australia and Western United States remains in China; some bought Chinese fabrics used for some UK production | Increased flexibility and responsiveness, productivity improvements, co-location of design and production, enabling innovation |

Table 4. (Continued)

| Cross-company comparison | Pseudonym | Offshored production/suppliers | | Reshored production/suppliers | |
|--------------------------|-----------|--|--|---|---|
| | | Selectivity | Outcome | Selectivity | Outcome |
| United Kingdom | Company8 | Width selectivity. Lower-cost basic items (e.g. loungewear, jogging bottoms/hoodies); products that cannot be made in the United Kingdom due to production capabilities (e.g. woven products, as the United Kingdom is stronger in jersey wear and woven not as readily available) | Reduced production costs. Wider variety of products | Width selectivity. Short product lifecycle products: reacting to trends/consumer demand (different product types). Woven products reshored due to offshore factory closures and demand requirements during pandemic | Speed to market, increased flexibility and responsiveness |

manufacturing setup based on future change. Our evidence supports this approach, as the companies in our study partitioned their supply chains to overcome cost/flexibility trade-offs. The first step in partitioning the supply chain was to segment product lines into cost-sensitive and high-margin, short-lead-time items. This would require companies to identify which activities they want to relocate, width versus depth selectivity (Fratocchi and Di Stefano, 2019). The cost-sensitive items were manufactured by exploiting existing efficiencies at offshored production facilities, while the high-margin, time-sensitive products were manufactured in onshored or nearshored facilities to ensure a flexible response to demand. This leads us to propose the following:

- P1a:* Companies can achieve the synergistic benefits of offshore efficiency and reshored/nearshored flexibility by first segmenting their product lines into low-margin, long-lead-time items and high-margin, short-lead-time items, and then by consideration of selectivity of production.
- P1b:* Selectivity, with respect to width (by product line) and/or depth (by production phase), is an antecedent for the development of an ambidextrous supply chain.

The companies in our study used structural partitioning to create 'parallel' supply chains that deliver products based on the demand profiles of their products. This finding builds on the work of Roscoe and Blome (2019), by extending the focus from structurally partitioning the manufacturing function to partitioning the supply chain. Moreover, our findings build on a recent study by Güemes-Castorena and Ruiz-Monroy (2020) which identifies that apparel industries can simultaneously capture multiple benefits by strategically segment-

ing suppliers and managing them differently. We suggest that segmenting product lines and the supply base is a necessary first step, but truly ambidextrous supply chains need to go further by being structurally partitioned to run in parallel according to product demand characteristics. For example, Company5 maintained a small proportion of manufacturing in China for its low-margin product lines, while moving the bulk of its production to Lithuania in order to service its primary Norwegian market. Doing so allowed the company to avoid border closures and plant shutdowns in China during the Covid-19 pandemic and limited its exposure to transportation blockages along sea and air routes between China and Norway. This leads us to propose:

- P2:* Parallel supply chains can be developed by structurally partitioning production and supply activities into offshored (efficient) and reshored/nearshored (flexible) activities.

Our empirical evidence, supported by the focus group, indicates that a combination of exploiting experiential learning in offshored manufacturing sites and exploring for new knowledge in reshored/nearshored facilities with suppliers can enhance innovation activities. For example, Company7 transferred the experiential knowledge it gained from manufacturing alongside key suppliers in China and combined this with new learnings gained from research and development (R&D) efforts at its UK plant. These knowledge synergies fed into Company7's R&D process and supported its new product development efforts. Similarly, in Company6, nearshoring gave the company access to a talented labour pool and new suppliers in the home market who became actively engaged in R&D activities. This finding supports earlier work by Stentoft, Mikkelsen and Jensen (2016), Lampón and González-Benito (2020) and Theyel and

Hofmann (2020), who found that companies that have reshored manufacturing have invested more in manufacturing innovation and collaboration with suppliers on new product and technology development efforts. The benefits of exploration and knowledge search in home markets are supported by Moradlou *et al.* (2021), who show that reshoring decisions enable companies to improve performance outcomes and innovative outputs. Our research builds on these studies by finding that it is the intentional combination of offshored and reshored production that facilitates exploration activities. Specifically, we found that the knowledge and information gained from offshore manufacturing can be combined with the new ideas and ways of working gained from moving production and sources of supply to home markets. This leads us to propose:

P3: A parallel supply chain design facilitates innovation activities by achieving synergies between the experiential knowledge gained from exploiting existing ways of working and the exploration advantages of working with new employees and suppliers in home markets.

Another interesting finding was how several companies in our study deliberately embedded surge capacity into newly established production facilities to allow the rapid transfer of production volumes in the event of facility or border closures. To do so, companies had latent capacity on their production lines, that could be switched on during a period of disruption (such as Covid-19). For example, we found that Company1 buffered its production volumes in Romania by using excess capacity in its Italian facilities during the pandemic. By building in ‘surge capacity’ in both plants, Company1 could actively transfer production volumes between plants when one location shut down due to Covid-19 restrictions. In this example, production volume swapping acted as a ‘bridge’ between the offshored, efficient supply chain and the reshored, flexible supply chain. Although, in this scenario, the volume swapping occurred from an offshore facility to a reshored facility, depending on the geographical factors – such as location of final market or place of disruption – and distinct capabilities in each facility, the spare capacities could be utilized and volume swapping can occur in both directions (e.g. from reshored to offshored facilities). Thus, we propose that production volume swapping creates further synergies between parallel supply chains and facilitates supply chain ambidexterity:

P4: A parallel supply chain design that permits production volume swapping between offshored and reshored/nearshored facilities allows companies to be responsive to supplier, facility and border closures during disruptive events.

Drawing together the four propositions, we now advance an empirically informed framework to illustrate a series of steps for developing a parallel, structurally ambidextrous, supply chain design (Figure 2). The first step in the framework is to partition the company’s product line into low-cost commodity items and high-margin, short-lead-time items. This can be both in terms of width (meaning that specific product lines were relocated) and in terms of depth (meaning that specific production activities were relocated). As the second step, the framework suggests that managers can look to structurally partition their manufacturing facilities based on these product lines and characteristics, with efficient, low-cost items made in offshored locations overseas and high-margin, short-lead-time items made in the home country. In the third step, the company can combine the experiential learning gained from working with offshore suppliers and combine this knowledge with the novel ideas that come from access to a new pool of labour and suppliers in home markets. We propose that these knowledge synergies facilitate R&D efforts and innovative new product outputs. Finally, in the fourth step, the framework proposes that a company can achieve structural ambidexterity in the supply chain by embedding surge capacity in its offshored and reshored production facilities. Production volume swapping allows companies to move between parallel supply chains to navigate factory and supplier shutdowns and keep production running in at least one facility at a time. By following the four steps outlined here, we propose that companies can achieve structural ambidexterity and build parallel supply chains (Figure 2).

Conclusions and contributions

Organizational ambidexterity theory asserts that balancing exploitation and exploration activities in a company is a dynamic rather than static (end-state) process (March, 1991). To be ambidextrous, companies must constantly change existing knowledge processes through experimentation and external search (Raisch *et al.*, 2009). We found the same to be true for the supply chains in our study. The framework in Figure 2 depicts an evolving process, where companies continue to exploit existing efficiencies in the manufacturing process, while seeking new knowledge from suppliers closer to home markets. To remain competitive, companies need to constantly adapt their sourcing, production and distribution processes in order to remain flexible and responsive to an ever-changing external business environment. This includes revising search processes to identify suppliers that possess novel opportunities and new knowledge, while experimenting with innovative products and technologies.

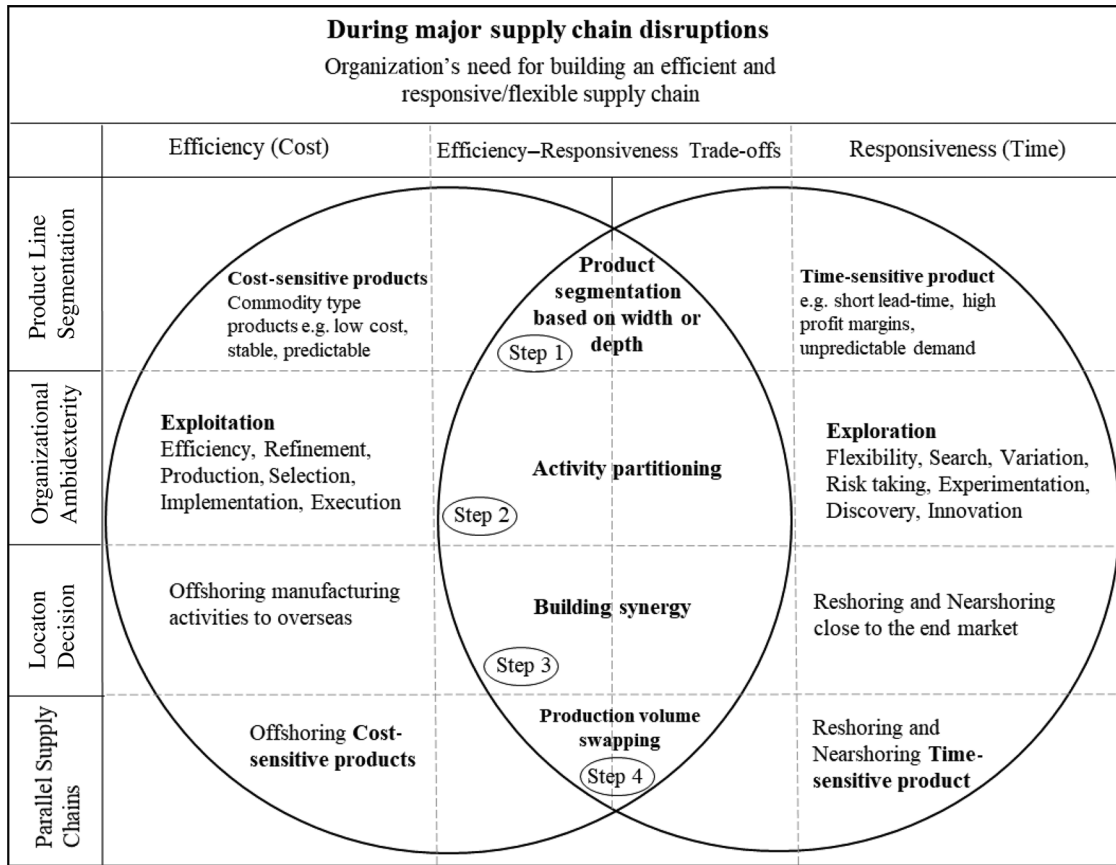


Figure 2. Location ambidexterity framework

Theoretical contributions

Using a theory elaboration approach, this study has built upon organizational ambidexterity theory in four important ways. First, this paper builds on earlier studies (Adler, Goldoftas and Levine, 1999; Gibson and Birkinshaw, 2004; O’Reilly and Tushman, 2013) regarding structural partitioning within organizational boundaries to overcome cost/flexibility trade-offs. Expanding upon the work of Roscoe and Blome (2019), we suggest that structural partitioning can be extended to the supply chain – allowing companies to overcome the cost/flexibility trade-offs of offshored and reshored/nearshored production. While there have been a number of developments in the supply chain ambidexterity literature (see Table 1), these existing studies do not explain how ambidextrous capabilities are developed through the manufacturing location decision. Our findings therefore address the call by Arlbjørn and Mikkelsen (2014) to provide further information on the relationship between ambidexterity and the manufacturing location decision.

Second, we advance propositions on how companies can structurally partition the supply chain, beginning by segmenting product lines and then matching these

product lines to either a low-cost offshored supply chain or a short-lead-time reshored/nearshored supply chain. These findings contribute to a recent study by Bettiol *et al.* (2023), who suggested that organizations can benefit from multiple locations and react to the pandemic by using company sites that are closer to major centres of demand. Our study further develops this idea by examining how companies can simultaneously pursue both offshoring and reshoring strategies to be more ambidextrous and respond to disruptions. The findings are likely to shape future research in the supply chain management and international business fields because it is evident that the manufacturing location decision is not an either/or choice between offshored or reshored production. Instead, our findings indicate that companies can use combinations of offshored/reshored and nearshored designs, as well as other hybrid approaches, where achieving an overall service offering that provides flexibility and efficiency becomes the ultimate aim for firms.

Third, we propose that companies can gain knowledge synergies by combining experiential learning from existing offshored production, with the new ideas and ways of working from staff and suppliers in home mar-

kets. We propose that these knowledge synergies can lead to enhanced R&D efforts with suppliers and new product development outputs. This finding answers the call of Roscoe and Blome (2019) to investigate structural ambidexterity across multiple stages in the supply chain.

Finally, we outline how companies can achieve ambidexterity in the supply chain by building surge capacity into offshored and reshored production facilities. We propose that companies can use production volume swapping to move manufacturing volumes between offshored and reshored facilities during disruptive supply chain events, such as factory and border closures during the Covid-19 pandemic.

Managerial implications

Our framework (see Figure 2) suggests that managers can partition product lines, and the supply chains that deliver these products to market, in different ways to embed ambidexterity in the supply chain. The framework is important to managers struggling with pressures to reduce costs due to rising inflation around the globe, while needing to deliver products to market quickly to remain competitive in today's turbulent business environment. Managers contending with these issues will be interested in the ideas provided here around segmenting product lines' width and depth and linking these segments to the offshored, nearshored and onshored production facilities. Our findings provide managers with industry examples of how to swap production volumes between parallel supply chains to embed ambidexterity in day-to-day operations, which allows companies to exploit efficiency and flexibility benefits simultaneously. In addition, we suggest that through the knowledge search activities that accompany reshoring/nearshoring initiatives, new R&D collaborations can occur with suppliers in local markets, leading to innovative new product offerings. Operating in home markets creates opportunities to gain from the knowledge spillovers that occur when suppliers collaborate in the new product and technology development process (Lawson and Potter, 2012).

We expect that our framework can change managerial and firm behaviour by challenging the widely held notion that the supply chain is a cost centre that needs to constantly strive for efficiencies. The Covid-19 pandemic has shown the folly of such an approach because while offshored production may be cost-efficient, if the company cannot get stock onto store shelves it cannot be sold. Flexibility, responsiveness to demand and resilience are now the key drives of global supply chain designs (Handfield, Graham and Burns, 2020), and our framework shows managers how to balance flexibility and efficiency to create ambidextrous, and resilient, supply chains capable of handling the next major global disruption.

Limitations and future research agenda

The results of this study should be viewed in light of its limitations. We claim to make analytical, not statistical, generalizations with our findings. Future studies can achieve statistical generalizations by conducting a large-scale survey based on a greater sample of companies in order to test the propositions we have advanced here. This study is limited to investigating the apparel and textile industries, which have unique characteristics, including short product lifecycle, high volatility, a high level of impulse purchase and excessive globalization. We encourage future researchers to examine the validity of our propositions and framework in other industries, such as healthcare and pharmaceuticals, aerospace and automotive, with different supply chain properties, whilst taking into account the external stakeholders and country-level environmental regulations (Sena *et al.*, 2022). Future researchers are also encouraged to conduct replication studies with different companies in different countries to validate or refute our results. It may prove interesting for future studies to explore if other major supply chain disruptions, such as the Ukraine–Russia war and tensions between China and Taiwan (Moradlou *et al.*, 2020, 2021; Roscoe *et al.*, 2020), prompt nearshoring/reshoring or 'friendshoring' activities and the creation of parallel supply chains with politically allied countries. In particular, scholars are encouraged to investigate the SC resilience from structural ambidexterity perspectives and link it to other emerging topics such as environmental, social and economic (ESG) perspectives (Choudhary *et al.*, 2023; Gupta, Wang and Czinkota, 2021).

Appendix 1

The interview protocol used for data collection during the follow-up interviews conducted after the start of the Covid-19 pandemic included the following questions:

1. Can you give a brief overview of the evolution of your companies in terms of location and connected make or buy decisions?
2. What were the main factors influencing your decision to reshore?
3. What lessons have been learnt from the reshoring experience?
4. Will the company continue to manufacture offshore and in the HOME COUNTRY?
5. Have you received support from the government to manufacture in the HOME COUNTRY?
6. Do you think there are enough HOME COUNTRY-based raw material suppliers to support your HOME COUNTRY business?
7. What are the main benefits and challenges of manufacturing in the HOME COUNTRY?

8. What are the main benefits and challenges of manufacturing offshore?
9. Has offshoring impacted your company's flexibility and efficiency? How?
10. Has reshoring impacted your company's flexibility and efficiency? How?
11. What do you think has been key to the survival of the company?
12. In the last year, a global pandemic has happened, how has your company managed it?
13. Did having reshored before support you in managing the issues created by the global pandemic?
14. Are you considering new relocations (both offshoring and reshoring) now?

References

- Adler, P. S., B. Goldoftas and D. I. Levine (1999). 'Flexibility versus efficiency? A case study of model changeovers in the Toyota production system', *Organization Science*, **10**, pp. 43–68.
- Arlbjørn, J. S. and O. S. Mikkelsen (2014). 'Backshoring manufacturing: notes on an important but under-researched theme', *Journal of Purchasing and Supply Management*, **20**, pp. 60–62.
- Armstrong, D., A. Gosling, J. Weinman and T. Marteau (1997). 'The place of inter-rater reliability in qualitative research: an empirical study', *Sociology*, **31**, pp. 597–606.
- Aslam, H., C. Blome, S. Roscoe and T. M. Azhar (2018). 'Dynamic supply chain capabilities', *International Journal of Operations & Production Management*, **38**, pp. 2266–2285.
- Aslam, H., B. Constantin, S. Roscoe and A. T. Mehmood (2020). 'Determining the antecedents of dynamic supply chain capabilities', *Supply Chain Management*, **25**, pp. 427–442.
- Baraldi, E., F. Ciabuschi, O. Lindahl and L. Fratocchi (2018). 'A network perspective on the reshoring process: the relevance of the home and the host-country contexts', *Industrial Marketing Management*, **70**, pp. 156–166.
- Barbieri, P., A. Boffelli, S. Elia, L. Fratocchi, M. Kalchschmidt and D. Samson (2020). 'What can we learn about reshoring after Covid-19?', *Operations Management Research*, **13**, pp. 131–136.
- Benstead, A. V., M. Stevenson and L. C. Hendry (2017). 'Why and how do firms reshore? A contingency-based conceptual framework', *Operations Management Research*, **10**, pp. 85–103.
- Bettioli, M., M. Capestro, E. Di Maria and S. Micelli (2023). 'Ambidextrous strategies in turbulent times: the experience of manufacturing SMEs during the COVID-19 pandemic', *International Journal of Physical Distribution & Logistics Management*, **53**, pp. 248–272.
- Birkinshaw, J. and K. Gupta (2013). 'Clarifying the distinctive contribution of ambidexterity to the field of organization studies', *Academy of Management Perspectives*, **27**, pp. 287–298.
- Blome, C., T. Schoenherr and D. Rexhausen (2013). 'Antecedents and enablers of supply chain agility and its effect on performance: a dynamic capabilities perspective', *International Journal of Production Research*, **51**, pp. 1295–1318.
- Braun, V. and V. Clarke (2006). 'Using thematic analysis in psychology', *Qualitative Research in Psychology*, **3**, pp. 77–101.
- Choudhary, N. A., M. Ramkumar, T. Schoenherr, N. P. Rana and Y. K. Dwivedi (2023). 'Does reshoring affect the resilience and sustainability of supply chain networks? The cases of Apple and Jaguar Land Rover', *British Journal of Management*, **34**, pp. 1138–1156.
- Dey, B., S. F. S. Alwi, M. M. Babu, S. K. Roy and S. S. Muhammad (2023). 'Brexit or brand it? The effects of attitude towards Brexit and reshored brands on consumer purchase intention', *British Journal of Management*, **34**, pp. 1215–1237.
- Di Stefano, C., L. Fratocchi and F. Merino (2018). 'Manufacturing relocations in the footwear industry: a comparison between Italy and Spain', *The International Journal of Advanced Manufacturing Technology*, **32**, pp. 455–460.
- Dubois, A. and L. Araujo (2007). 'Case research in purchasing and supply management: opportunities and challenges', *Journal of Purchasing and Supply Management*, **13**, pp. 170–181.
- Eisenhardt, K. M. and M. E. Graebner (2007). 'Theory building from cases – opportunities and challenges', *Academy of Management Journal*, **50**, pp. 25–32.
- Ellram, L. M., W. L. Tate and C. Billington (2008). 'Offshore outsourcing of professional services: a transaction cost economics perspective', *Journal of Operations Management*, **26**, pp. 148–163.
- Ellram, L. M., W. L. Tate and K. J. Petersen (2013). 'Offshoring and reshoring: an update on the manufacturing location decision', *Journal of Supply Chain Management*, **49**, pp. 14–22.
- Financial Times (2019). 'How extreme agility put Zara ahead in fast fashion'. Available at: <https://www.ft.com/content/3f581046-cd7c-11e9-b018-ca4456540ea6> [Accessed 30 March 2013].
- Fisher, G. and H. Aguinis (2017). 'Using theory elaboration to make theoretical advancements', *Organizational Research Methods*, **20**, pp. 438–464.
- Foroudi, P., R. Marvi, M. T. Cuomo, R. Bagozzi, C. Dennis and R. Jannelli (2022). 'Consumer perceptions of sustainable development goals: conceptualization, measurement and contingent effects', *British Journal of Management*, **34**, pp. 1157–1183.
- Fratocchi, L., C. Di Mauro, P. Barbieri, G. Nassimbeni and A. Zanon (2014). 'When manufacturing moves back: concepts and questions', *Journal of Purchasing and Supply Management*, **20**, pp. 54–59.
- Fratocchi, L. and C. Di Stefano (2019). 'Manufacturing reshoring in the fashion industry: a literature review', *World Review of Intermodal Transportation Research*, **8**, pp. 338–365.
- Gibson, C. B. and J. Birkinshaw (2004). 'The antecedents, consequences and mediating role of organizational ambidexterity', *Academy of Management Journal*, **47**, pp. 209–226.
- Gillani, A., S. Kutaula and P. S. Budhwar (2022). 'Heading home? Reshoring and sustainability connectedness from a home-country consumer perspective', *British Journal of Management*, **34**, pp. 1117–1137.
- Gray, J. V., K. Skowronski, G. Esenduran and M. J. Rungtusanatham (2013). 'The reshoring phenomenon: what supply chain academics ought to know and should do', *Journal of Supply Chain Management*, **49**, pp. 27–33.
- Gualandris, J., H. Legenvre and M. Kalchschmidt (2018). 'Exploration and exploitation within supply networks: examining purchasing ambidexterity and its multiple performance implications', *International Journal of Operations & Production Management*, **38**, pp. 667–689.
- Güemes-Castorena, D. and B. C. Ruiz-Monroy (2020). 'Ambidexterity in the supply chain: studying the apparel industry', *International Journal of Agile Systems and Management*, **13**, pp. 130–158.
- Gupta, S., Y. Wang and M. Czinkota (2021). 'Reshoring and sustainable development goals', *British Journal of Management*, **32**, pp. E6–E9.
- Handfield, R. B., G. Graham and L. Burns (2020). 'Corona virus, tariffs, trade wars and supply chain evolutionary design', *International Journal of Operations & Production Management*, **40**, pp. 1649–1660.
- Hilletofth, P., D. Eriksson, W. Tate and S. Kinkel (2019). 'Right-shoring: making resilient offshoring and reshoring decisions', *Journal of Purchasing and Supply Management*, **25**, art. 100540.
- Kassotaki, O. (2022). 'Review of organizational ambidexterity research', *SAGE Open*, **12**, 10.1177/21582440221082127.
- Ketokivi, M. and T. Choi (2014). 'Renaissance of case research as a scientific method', *Journal of Operations Management*, **32**, pp. 232–240.
- Krippendorff, K. (2012). *Content Analysis: An Introduction to its Methodology*. Los Angeles, CA: Sage.

- Kristal, M. M., X. Huang and A. V. Roth (2010). 'The effect of an ambidextrous supply chain strategy on combinative competitive capabilities and business performance', *Journal of Operations Management*, **28**, pp. 415–429.
- Lampón, J. F. and J. González-Benito (2020). 'Backshoring and improved key manufacturing resources in firms' home location', *International Journal of Production Research*, **58**, pp. 6268–6282.
- Lawson, B. and A. Potter (2012). 'Determinants of knowledge transfer in inter-firm new product development projects', *International Journal of Operations and Production Management*, **32**, pp. 1228–1247.
- Lee, S. M. and J. S. Rha (2016). 'Ambidextrous supply chain as a dynamic capability: building a resilient supply chain', *Management Decision*, **54**, pp. 2–23.
- March, J. G. (1991). 'Exploration and exploitation in organizational learning', *Organization Science*, **2**, pp. 71–87.
- Markides, C. (2006). 'Disruptive innovation: in need of better theory', *Journal of Product Innovation Management*, **23**, pp. 19–25.
- McMaster, M., C. Nettleton, C. Tom, B. Xu, C. Cao and P. Qiao (2020). 'Risk management: rethinking fashion supply chain management for multinational corporations in light of the COVID-19 outbreak', *Journal of Risk and Financial Management*, **13**, p. 173.
- Medina-Serrano, R., R. González-Ramírez, J. L. Gascó and J. Llopis (2020). 'Strategic sourcing: developing a progressive framework for make-or-buy decisions', *Journal of Industrial Engineering and Management*, **13**, pp. 133–154.
- Moradlou, H., C. Backhouse and R. Ranganathan (2017). 'Responsiveness, the primary reason behind re-shoring manufacturing activities to the UK', *International Journal of Physical Distribution & Logistics Management*, **47**, pp. 222–236.
- Moradlou, H., L. Fratocchi, H. Skipworth and A. Ghadge (2020). 'Post-Brexit back-shoring strategies: what UK manufacturing companies could learn from the past?', *Production Planning & Control*, **33**, pp. 1310–1336.
- Moradlou, H., H. Reefke, H. Skipworth and S. Roscoe (2021). 'Geopolitical disruptions and the manufacturing location decision in multinational company supply chains: a Delphi study on Brexit', *International Journal of Operations & Production Management*, **41**, pp. 102–130.
- Mudambi, R. (2008). 'Location, control and innovation in knowledge-intensive industries', *Journal of Economic Geography*, **8**, pp. 699–725.
- Ngai, E., S. Peng, P. Alexander and K. Moon (2014). 'Decision support and intelligent systems in the textile and apparel supply chain: an academic review of research articles', *Expert Systems with Applications*, **41**, pp. 81–91.
- Nielsen, J. A., L. Mathiasen and A. M. Hansen (2018). 'Exploration and exploitation in organizational learning: a critical application of the 4I model', *British Journal of Management*, **29**, pp. 835–850.
- O'Reilly, C. A. and M. L. Tushman (2013). 'Organizational ambidexterity: past, present, and future', *Academy of Management Perspectives*, **27**, pp. 324–338.
- Park, Y. I., P. A. Pavlou and N. Saraf (2020). 'Configurations for achieving organizational ambidexterity with digitization', *Information Systems Research*, **31**, pp. 1376–1397.
- Patel, P. C., S. Terjesen and D. Li (2012). 'Enhancing effects of manufacturing flexibility through operational absorptive capacity and operational ambidexterity', *Journal of Operations Management*, **30**, pp. 201–220.
- Piatanesi, B. and J. M. Arauzo-Carod (2019). 'Backshoring and nearshoring: an overview', *Growth and Change*, **50**, pp. 806–823.
- Raisch, S., J. Birkinshaw, G. Probst and M. L. Tushman (2009). 'Organizational ambidexterity: balancing exploitation and exploration for sustained performance', *Organization Science*, **20**, pp. 685–695.
- Roscoe, S. and C. Blome (2019). 'Understanding the emergence of re-distributed manufacturing: an ambidexterity perspective', *Production Planning & Control*, **30**, pp. 496–509.
- Roscoe, S., H. Skipworth, E. Aktas and F. Habib (2020). 'Managing supply chain uncertainty arising from geopolitical disruptions: evidence from the pharmaceutical industry and Brexit', *International Journal of Operations & Production Management*, **40**, pp. 1499–1529.
- Sarkis, J. (2020). 'Supply chain sustainability: learning from the COVID-19 pandemic', *International Journal of Operations & Production Management*, **41**, pp. 63–73.
- Sena, V., R. P. Kanungo, S. Ozdemir, N. Yannopoulou and P. Patel (2022). 'Are reshoring decisions influenced by external stakeholders and country-level environmental regulation?', *British Journal of Management*, **34**, pp. 1184–1214.
- Stentoft, J., O. S. Mikkelsen and J. K. Jensen (2016). 'Offshoring and backshoring manufacturing from a supply chain innovation perspective', *Supply Chain Forum: An International Journal*, **17**, pp. 190–204.
- Tamayo-Torres, J., J. K. Roehrich and M. A. Lewis (2017). 'Ambidexterity, performance and environmental dynamism', *International Journal of Operations & Production Management*, **37**, pp. 282–299.
- Theyel, G. and K. H. Hofmann (2020). 'Manufacturing location decisions and organizational agility', *Multinational Business Review*, **29**, pp. 166–188.
- Van Hoek, R. (2020). 'Research opportunities for a more resilient post-COVID-19 supply chain – closing the gap between research findings and industry practice', *International Journal of Operations & Production Management*, **40**, pp. 341–355.
- Verbeke, A. (2020). 'Will the COVID-19 pandemic really change the governance of global value chains?', *British Journal of Management*, **31**, pp. 444–446.
- Wilkinson, S. (2004). 'Focus group research'. In D. Silverman (ed.), *Qualitative Research: Theory, Method, and Practice*, 2nd edn, pp. 177–199. London: Sage.
- Wulandhari, N. B. I., P. Budhwar, N. Mishra, S. Akbar, Q. Do and G. Milligan (2022). 'Organizational resilience to supply chain risks during the COVID-19 pandemic', *British Journal of Management*, **34**, pp. 1282–1315.
- Yin, R. K. (2014). *Case Study Research: Design and Methods*, 5th edn. Thousand Oaks, CA: Sage.

Hamid Moradlou is an Associate Professor of Supply Chain Management at Warwick Manufacturing Group, University of Warwick. He obtained his PhD from Loughborough University and was previously part of Cranfield School of Management. His research interests mainly focus on investigating the supply chain resilience through manufacturing location decisions (e.g. offshoring/reshoring) and the impacts of external factors such as the new generation of technologies, geopolitical tensions and sustainability on location decisions.

Albachiara Boffelli is an Assistant Professor at the University of Bergamo. She holds a PhD in Economics and Technology Management from a joint PhD programme between the University of Bergamo and the University of Pavia. Her research focuses on the topic of manufacturing relocation decisions, with a focus on reshoring. In addition, her research interests include corporate social responsibility and sustainability, as well as the impact of new technologies on organizations and supply chains.

Deodat Mwesiumo is a Professor in Supply Chain Management at Molde University College. He holds an MSc and a PhD in Logistics, both from Molde University College. His current research activities focus on sustainable supply chain management, production location and digital business transformation. His work has appeared in internationally accredited scientific journals, including *Technovation*, *Journal of Public Procurement* and *Journal of Purchasing and Supply Management*.

Amy Benstead is a Senior Lecturer in Fashion Management in the Department of Materials, University of Manchester. She holds a PhD in Management Science from Lancaster University Management School and is a board member of the European Operations Management Association (EurOMA). Her research interests include socially sustainable supply chain management and global sourcing, with a particular focus on the textiles and fashion industry.

Samuel Roscoe is a Professor in Supply Chain and Operations Management at Thompson Rivers University and a fellow of the UK Trade Policy Observatory. His research interests are in how geopolitical disruptions (US–China trade war, Brexit, Covid-19) and innovative technologies (additive manufacturing, blockchain, artificial intelligence) are transforming global supply chains.

Sanaa Khayyam is currently a PhD student at the University of Bergamo, Italy. Her research interest lies mainly in investigating the reshoring phenomenon and its impact on supply chain management in developed countries. In addition, she has a number of years of experience in supply chain consultancy.