

Supply chain reconfiguration in response to geopolitical disruptions: exploration versus exploitation

Hamid Moradlou

Warwick Manufacturing Group; hamid.moradlou@warwick.ac.uk

Heather Skipworth

Cranfield School of Management; heather.skipworth@cranfield.ac.uk

Lydia Bals

University of Applied Sciences Mainz; lydia.bals@hs-mainz.de

Emel Aktas

Cranfield School of Management; emel.aktas@cranfield.ac.uk

Abstract

Companies have extensively invested in offshoring strategies, creating geographically dispersed, complex networks. Organisational ambidexterity through balancing the exploration (flexibility) and exploitation (efficiency) capabilities in supply chains enables firms mitigate the negative impact of supply chain disruptions. In this study, we aim to identify the mechanisms by which companies respond to geopolitical and natural disruptions in the context of the US-China trade war, Brexit, and the coronavirus pandemic. This study highlights companies' need to be simultaneously efficient and responsive in their supply chain operations to become resilient against a global pandemic and geopolitical tensions.

Keywords: Geopolitical disruption, exploration, exploitation, eclectic paradigm, case study

Introduction

Global supply chains of multinational enterprises (MNEs) orchestrate geographically dispersed, complex networks (McWilliam et al. 2020). MNEs have extensively invested in offshoring strategies predominantly in pursuit of efficiency improvement and cost reduction (Tate, 2014; Moradlou and Backhouse, 2016). However, globalisation has made MNEs more susceptible to disruptions that can occur at any point along their extended supply chains (Ferdows, 2018). For instance, supply chains worldwide have experienced an unprecedented shock resulting from the global COVID-19 pandemic (Ivanov, 2020). Similarly, recent geopolitical tensions, such as the US-China trade war and Brexit in the UK (Roscoe et al., 2020) as well as Russia's invasion of Ukraine, have caused significant disruptions in supply chains worldwide.

Scholars have investigated the trade-off between efficient and flexible supply chains for a long time (Grant 1991; Hayes and Wheelwright 1984; Skinner 1985). Initially, efficiency and flexibility strategies were somewhat viewed as two distinct strategies. Ambidexterity in the OM context represents the organisations' ability to achieve both efficient and flexible supply chains simultaneously (Adler et al. 1999). Lee and Rha (2016) suggest that organisational

ambidexterity allows firms to mitigate the negative impact of supply chain disruptions, thereby enhancing business performance.

In this study, we aim to identify the mechanisms by which companies cope with supply chain disruptions, addressing the following research question: *How do companies utilise supply chain ambidexterity to respond to geopolitical disruptions?*

To answer this question, empirical data were gathered from 14 MNEs over 27 interviews with senior executives of MNEs in various sectors. This working paper features 17 interviews of these case studies with 11 MNEs. These MNEs are manufacturing companies affected by the uncertainties arising from Brexit, US-China Trade War, and governments' responses to the COVID-19 Pandemic, making this study situationally grounded, reaching theoretically informed propositions. The interview findings are triangulated using secondary data from news outlets, company websites, annual reports, and industry publications to improve construct validity.

The finding in this study shows that companies can build exploration and exploitation capabilities by looking at the Dunning's eclectic paradigm, in particular location advantages (Dunning, 1988, 1980). These are the efficiency seeking, resource seeking, market seeking, and strategic asset seeking advantages.

Literature

Exploration and Exploitation

For companies to survive in today's unpredictable marketplace, they need to be able to explore new market opportunities and at the same time exploit existing efficiencies within their supply chains (Adler et al. 1999). Organisational learning theory emphasises that both exploration and exploitation strategies are essential for organisational success, but they compete for scarce resources (March, 1991). The exploration capability refers to companies' ability to introduce innovative ideas and capitalise on new opportunities to respond to disruptions in their supply chains (March, 1991). It includes searching for innovative new ideas, experimentation, risk taking, and flexibility. On the other hand, exploitation centres around cost reduction and efficiency enhancement through standardisation of operations. Therefore, it includes such concepts as cost reduction, efficiency, continuous improvement, and execution/implementation of ideas (March, 1991).

The trade-off between efficiency versus flexibility has been studied in the OM literature for a long time, arguing that pursuing the two strategies simultaneously may lead to companies becoming stuck in the middle, resulting in high switching costs from one strategy to the other (Grant 1991; Hayes and Wheelwright 1984; Skinner 1985). According to some scholars, any attempt to reconcile both strategies can have a sub-optimal outcome. For instance, Hayes and Wheelwright (1984) assert that the manufacturing function should focus on one performance objective, efficiency or flexibility, to achieve optimum results. In a similar vein, March (1991) explains that both exploration and exploitation are essential for organisations, but they compete for scarce resources and are fundamentally incompatible. However, more recently, this school of thought has been challenged by another group of scholars who believe that companies can simultaneously adopt a responsive and efficient approach to managing their operations (Gibson and Birkinshaw 2004; Adler et al. 1999; Roscoe and Blome 2019). This is widely referred to as organisational ambidexterity, meaning that the organisation can pursue two disparate and conflicting strategies at the same time (Skinner 1985).

Organisational 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 (Gibson and Birkinshaw 2004; Tamayo-Torres et al., 2017). Organisational ambidexterity can be achieved through switching of job roles and restructuring organisational structures (Adler et al., 1999). Work can be

structured so that people switch successively between exploration tasks (search, research, and development) and exploitation tasks (cost reduction, continuous improvement of production and transportation). The ambidexterity literature seems to have converged around the duality of exploration and exploitation, although these terms have broad definitions (Birkinshaw and Gupta, 2013).

Initially ambidexterity was conceptualised to apply to a function (Raisch et al., 2009) or an individual (Rogan and Mors, 2014). Recently, scholars have extended the ambidexterity notion beyond firms' internal boundaries to the supply chain (Blome, Schoenherr and Kaesser, 2013; Roscoe and Blome, 2019; Aslam et al. 2018). Similar to the above discussion, supply chain ambidexterity is defined as the ability to simultaneously pursue seemingly conflicting goals of achieving both supply chain exploitation (efficiency) and exploration (flexibility) practices (Kristal et al., 2010). In contrast to Fisher (1997) who believes that organisations should adopt efficient supply chains for functional products or responsive supply chains for innovative products, ambidextrous supply chains have elements of both flexibility and efficiency to handle a diverse range of product characteristics (Rojo et al. 2016). This calls for a careful harmonisation of the contradictory demand characteristics imposed by the market. Nevertheless, it is found that the supply chain ambidexterity can further enhance manufacturing performance by acting as an enabler across quality, speed, flexibility, reliability, and cost dimensions (Tamayo-Torres et al., 2017). In a similar vein, Blome et al. (2013) studied the role of supply chain ambidexterity in increasing the innovation outputs of buyer-supplier engagements, whereas Rojo et al. (2016) found that the optimal level of supply chain flexibility can be achieved by building a supply chain ambidexterity capability beyond the buyer-supplier dyad. Furthermore, Aslam et al. (2018) provide a new perspective where a product can have a flexible and efficient supply chain when underpinned by the dynamic supply chain capabilities of market sensing, supply chain agility, and adaptability.

Constant et al. (2020) distinguish between four types of ambidexterity; 1) contextual ambidexterity (same people combining exploration and exploitation activities and targets coexisting), 2) sequential ambidexterity (exploitation and exploration are sequenced over time and follow a natural cycle of moving from one to the other), 3) structural ambidexterity (firms develop two distinct and autonomous organizational units), and 4) managerial ambidexterity (manager's behavioural orientation toward combining exploration and exploitation). However, a potential way to materialise an ambidextrous supply chain is through structural ambidexterity (Duncan, 1976). A company can manage the trade-offs between conflicting strategies by employing a dual structure where certain sub-units focus on alignment whilst others focus on adaptation (Duncan, 1976). Similarly, Adler et al. (1999) suggest that companies can benefit from the cost advantages associated with repetitive routines and simultaneously utilise flexible manufacturing systems during non-routine work by partitioning themselves into subunits. Tushman and O'Reilly (1996) explore how ambidexterity strengthens the market and technological leadership by making companies proactive to compete both in mature and emerging markets. Lee and Rha (2016) views supply chain ambidexterity as a mitigating strategy to minimise the impacts of supply chain disruptions by developing dynamic capabilities. The study shows that "to take advantage of an ambidextrous SC, through minimising the negative impact of SC disruptions and maximising firm performance, firms should continually search for creative ways to satisfy new market needs and adapt to the fast-changing business environment" (Lee and Rha 2016, pp. 17). Whilst the literature on supply chain ambidexterity is increasingly expanding (Lee and Rha 2016; Blome et al. 2013; Alder et al. 1999; Aslam et al. 2018; Rojo et al. 2016; Tamayo-Torres et al., 2017; Roscoe and Blome, 2019), to the best of the authors' knowledge, no study has investigated the relationship between the supply chain disruptions and the companies' exploration and exploitation capabilities, within the context of supply chain ambidexterity.

Dunning's Eclectic Paradigm

When firms consider how to set up their value chain, they are confronted both with a governance (make or buy) and a location decision (e.g., Tate and Bals, 2017; Foerstl et al., 2016). Fittingly to these decisions, Dunning's eclectic paradigm is a theory of how firms choose between exports, licensing, and foreign direct investment (FDI) as alternatives for serving overseas markets (Dunning, 1988, 1980). The eclectic paradigm posits that multinational activities are driven by ownership, location, and internalisation advantages (OLI). Ownership advantages are firm-specific advantages which are directly related to the resources controlled or owned by a firm. A firm achieves internalisation advantages if it eliminates transaction costs associated with market interaction and internalises these activities within its own hierarchy. So, these relate to the governance decision. Location-specific advantages are based on resources, markets, networks, institutional structures, or other advantages specific to a geographic entity and cannot be moved. They relate to the location decision.

The ownership, location, and internalization advantages of the eclectic paradigm have been widely applied in the international business (IB) literature to explain the origin, level, pattern, and growth of offshore activities of MNEs (Eden and Dai, 2010), including international production and foreign-owned activities such as FDI (Dunning, 1988; 2001; Stoian and Filippaios, 2008). Also, the value of applying location advantages determinant of the eclectic paradigm to the reshoring location decision is increasingly acknowledged in the IB literature (Albertoni et al., 2017; Barbieri et al., 2019; Grappi et al., 2018; McIvor and Bals, 2021). Dunning's eclectic paradigm can support an understanding the influence of location attractiveness on value chain configuration decisions.

Turning specifically towards what makes firms change their location(s), Dunning (1998, 2001) suggests that MNEs engage in internationalization of their activities because of four advantages: (1) Resource-seeking: concerns the availability of raw materials, infrastructure, local talent/qualified personnel (Moradlou et al., 2021b; McIvor and Bals, 2021; Graf and Mudambi, 2005), (2) Market-seeking: access to (growing) markets, proximity to customers and government's economic policies (Gerbl et al., 2015; Moradlou et al., 2021, 2017; McIvor and Bals, 2021), (3) Efficiency-seeking: production cost-related factors and government incentives (Graf and Mudambi, 2005; Moradlou et al., 2021b; McIvor and Bals, 2021), and (4) Strategic asset-seeking: focus on core activities, IP protection and synergies related to maintaining a local presence (Stentoft et al. 2016; Moradlou et al., 2021b).

In this context, it is also worth noting that location attractiveness is relative to home country attractiveness, so either deteriorations in the host country or improvements in the home country can induce location changes from the MNE's country of origin to another country (Baraldi et al., 2018). We recognized this particularly in the market seeking advantage category as some factors mainly relate to the current location or to the (foreign) destination. The wealth of location advantage factors illustrates the expansive body of knowledge that has developed regarding these factors over the last decades (e.g., Hannibal and Knight, 2018; McIvor and Bals, 2021; McWilliam et al., 2020; Moradlou et al., 2021a, 2017; Tate et al., 2014; Wagner, 2019).

Methodology

This research uses a theory elaboration methodology, which focuses on the contextualised logic of a general theory (Ketokivi and Choi, 2014). To elaborate on Dunning's eclectic paradigm and organisational learning theory, we worked abductively (Niiniluoto, 1999), continuously moving between the empirical data and theory to arrive at a robust set of findings (Josephson and Josephson 1996). While guided by a priori theoretical considerations, through a theoretical framework developed in the literature review, we remained open to unanticipated findings and the possibility that general theories require reformulation (Merton, 1968).

The research design is based on multiple case studies of 14 manufacturing MNEs. This allowed the phenomena of exploration, exploitation, and location decisions to be studied within the context of real-life events: Brexit, the US-China Trade War, and COVID-19, making this study situationally grounded, reaching theoretically informed propositions. We used a theoretical sampling approach to select the case companies for our study based on defined criteria (Eisenhardt, 1989). So, companies were selected from a range of sectors such that exploration, exploitation, and location decisions could be studied in different contexts, while ensuring that the company Head Office was in the UK or USA to reduce any variation in cultural norms. Also, we ensured that the supply chains of all companies were impacted in some way by disruptions induced by any of Brexit, the US-China trade war, COVID-19 contexts. The informants from each company were senior executives involved in strategic supply chain decisions.

Brexit and the US-China trade war occurred more or less in parallel, and began in 2016, continuing to the end of 2020, while COVID-19 emerged in Wuhan, China December 2019 spreading the rest of the world and shutting borders in the second quarter of 2020 and continuing to the day of writing. Twenty-seven interviews with managers working for 14 MNE case companies were conducted in two phases:

- the first phase focussed on the effects of Brexit and the US-China trade war (while considering effects of Covid-19) and spanned from 9th January to 10th June 2020.
- the second phase focussed on the effects of COVID-19 and spanned from 6th December 2020 to 30th June 2021

Figure 1 provides the timeline of Brexit, the US-China Trade War and COVID-19 in relation to the two phases of data collection.

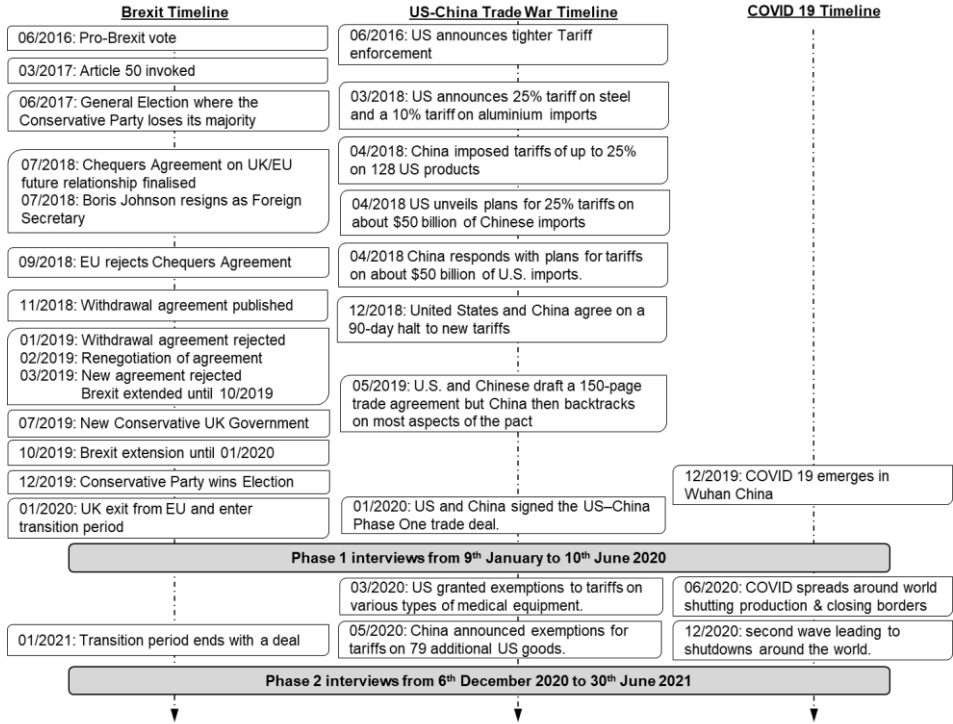


Figure 1, timeline of Brexit, the US-China Trade War and COVID-19 in relation to the two phases of data collection

Interviewees were selected on the basis of their job description and knowledge on supply chain management and location decisions at a multinational level in response to the supply

chain disruptions of interest. Where possible, multiple informants were used to achieve source triangulation. The interview findings were triangulated with secondary data from news outlets, company websites, annual reports, and industry publications. This improves construct validity ensuring corroboration between the interview findings and secondary sources. The interviews were between 40 and 77 minutes in duration, were recorded (with the permission of the interviewee) and transcribed verbatim. The transcription was then checked, and in some cases slightly edited, by the interviewee to validate the transcript.

Findings and discussion

The recent geopolitical disputes and global pandemic have caused varying disruptions in supply chains worldwide. The unpredictable nature of these disruptions has meant that some companies had no prior planning or mitigation strategy in place and were exposed to significant risks. The following statements highlight the impact of disruption on demand depending on the context.

" ... for things like soy and particularly wheat for example and it is more about declining demand on wheat rather than the tax implications of the US/China trade war." FMCG1 JAN 2020

"Brexit is not going to impact on how many damaged cars there are on the road, so we are not impacted by a manufacturing plant shutting down and moving somewhere else." MANUFACTURING1 FEB 2020

"One of my suppliers is an SME in the East Midlands who saw their aerospace product demand disappear overnight, on a product they'd been supplying for 30 years. It's worse those suppliers who have almost sole reliance upon one customer." AEROSPACE1 JAN 2021

Companies exhibit various strategies to cope with these exogenous shocks (van Hoek, 2020). During the analysis, distinct differences between the exploration and exploitation activities emerged. Preliminary findings suggest that MNEs used innovative ideas as part of their exploration capabilities to respond to disruptions. Innovative ideas were explored with local partners in the host country within resource seeking advantage, in customer service and proximity to major centres of demand within market seeking advantage, to reduce transport costs, ensure supply continuity, and increase supply chain resilience within efficiency seeking advantage and in automation and innovation in strategic asset seeking advantage. The latter is evident in the following quote:

"...then we build on the control tower approach. Automated it, brought in a daily cadence and we shifted our focus then from, rather than getting bits in, but also the supplier restart plan." AUTOMOTIVE1 JAN 2021

Interestingly, due to the unpredictable nature of disruptions, the exploration activities in terms of experimentation and risk taking were not significantly evident in the analysis. Having said that, experimentation was used in the context of increasing supply chain resilience and risk taking in the context of accessing suppliers and sharing risks with them. However, flexibility was extensively leveraged as a coping mechanism to mitigate the impacts of disruptions. Flexibility was found to access local and international markets and centres of demand in the face of global competition. Flexibility capability was also frequently used to gain efficiency seeking advantage, in terms of lowering manufacturing costs, using capital intensive resources, ensuring supply continuity, and lowering labour costs. Within strategic asset seeking advantage, flexibility capability was leveraged to achieve synergies related to maintaining a local presence.

"we try to create flexibility, with China, we would make sure we have options there that normally we would not necessarily pursue. It is not like a big risk on our radar now and the fact that we have a significant local footprint gives us a little bit more leverage." PHARMA1 JAN 2020

In terms of exploitation capabilities, cost reduction was a common theme, appearing under resource seeking advantage through availability of raw materials/natural resources/critical or knowledge-intensive assets. In the face of global competition, MNEs exploit cost reduction approaches. However, cost reduction is most pronounced within the efficiency seeking advantage, in terms of lower costs of manufacturing, labour costs, and non-tariff costs such as inventory levels and border delays.

“And there, we of course understood immediately, or quite quickly, that you needed to sit down and how do you make it kind of Covid-proof? So, segregation, masks, minimise the number of people. It was just in a reverse scenario because we were a little bit lucky, if that’s the word, that we were then building it to get people back. So, we didn’t send people home. We just slowly brought people back.” PHARMA1 DEC 2020

Exploiting efficiencies were observed in the context of proximity to customers/closeness to major centres of demand within market seeking advantage. However, more significantly it was evident in efficiency seeking advantage in forms of lower costs of manufacturing and transport costs, supply chain resilience and environmental concerns. The following quote highlights the importance of communication for quick decision making and enhancing the efficiency.

“...we’ve run a scenario and we get people working on it, etc., this of course, was across the end-to-end supply chain, so it went into production procurement, external supply, internal manufacture, logistics, everything. I think what has been very good, and we will continue, is the togetherness of the supply chain, actually, the communication has become much briefer, much more, I’m going to say in-depth, which sounds contrary to briefer, but we’ve had much more real conversation, quicker conversation, better decision-making, and I think we’ll continue that.” PHARMA2 JAN 2021

Regulatory requirements forced MNEs to leverage their continuous improvement capabilities. The implementation aspect of exploitation was repeatedly leveraged to gain all four location advantages. Starting with the resource seeking advantages, companies exploited availability of raw materials/natural resources/critical (knowledge intensive) assets, availability of infrastructure, availability of local talent/qualified personnel, availability of transportation, product specialization, local partners in the host country and access to suppliers (for inputs). With respect to the market seeking advantages, companies exploited access to local and international markets, responsiveness to demand, demand volatility, global competition, and regulatory requirements. In terms of efficiency seeking advantages, companies considered transportation costs, supply continuity (to avoid disruption), supply chain resilience and government incentives. Finally, in terms of strategic asset seeking advantage, companies focused on core activities, synergies related to maintaining a local presence (e.g., gaining localised tacit knowledge), automation and IP protection.

The existing literature shows that simultaneous practice of exploration and exploitation improves an organization’s survival (Rojo et al 2016; Tushman and O’Reilly. 1996; Tamayo-Torres et al., 2017; Lee and Rha., 2016; Birkinshaw and Gupta 2013). However, these studies do not analyse how the location advantages allow companies to mitigate the impact of disruption. One of the main findings from the analysis above is that all cases pursued both exploitation and exploration simultaneously to cope with the disruptions. Excessive exploration at the expense of exploitation can be costly. For instance, focusing only on exploitation without exploration discourages the companies from pursuing learning and development and encourage them to chase short term targets and potentially miss out on long-term investments and opportunities. Our results show that all four dimensions of Dunning’s location advantages (Dunning, 1998), efficiency seeking, market seeking, resource seeking, and strategic asset seeking advantages, can be leveraged to increase the supply chain ambidexterity which in turn will help respond to the impacts of a range of geopolitical disruptions. This is also in line with

a study done by Aslam et al (2020), looking at the impact of supply chain ambidexterity and supply chain resilience during natural calamities, man-made disasters, and political and economic upheavals.

Conclusion

Given the heightened supply chain uncertainties such as country lockdowns leading to factory closures, unpredictable demand and expensive freight and transportation, managers are forced to juggle multiple dichotomies in their supply chains including efficiency and flexibility, adaptability and alignment, and integration and responsiveness to cope with an ever-changing business environment. Managers are now obliged to re-evaluate the manufacturing location decision to mitigate supply chain disruption risks that can occur around the world, while minimizing production costs. This study highlights the need for the companies to be simultaneously efficient and responsive in their operations to cope with the impact of a global pandemic and geopolitical tensions. In this study we contribute to the organisational learning theory and Dunning's eclectic paradigm by investigating how the need for balancing the exploration and exploitation capabilities through supply chain ambidexterity during a global pandemic or geopolitical disruption, affects the supply chain location decision.

The results of this study should be viewed considering its limitations. This working paper features only 17 interviews from 11 cases out of 27 interviews and 14 case studies. Whilst this study aims for theory elaboration and analytical generalisation, the statistical generalisation could be reached by conducting a large-scale survey based on a greater sample of companies. We call on further research to use other research methodologies, such as surveys or questionnaires, to test and validate our propositions and framework. Further, as this study was conducted in the context of geopolitical disruptions and COVID-19, we would also like to invite future researchers to examine our findings in other contexts such as environmental disruptions.

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