

Understanding how multinational enterprises manage global supply chains during major geopolitical disruptions: the role of structural ambidexterity

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Abstract

This paper seeks insights into how multinational enterprises restructure their global supply chains to manage the uncertainty caused by geopolitical disruptions. Evidence is gathered from 29 interviews with senior executives working for 14 multinational companies affected by Covid-19, the US-China Trade War and Brexit. To manage this uncertainty, we find that companies implement structural ambidexterity in supply chains by partitioning internal subunits, reconfiguring supplier networks, and creating parallel supply chains. The findings contribute to Dunning's eclectic paradigm by explaining how organisational ambidexterity is extended beyond firm boundaries and embedded in global supply chains to mitigate uncertainty and gain exploration and exploitation benefits.

Keywords: Supply chain design, ambidexterity, organizational learning theory

Introduction

The relentless pursuit of globalisation has made Multinational Enterprises (MNEs) susceptible to geopolitical disruptions including armed conflict and tensions between nation states, which affect the normal and peaceful course of international trade (Roscoe *et al.*, 2022; Caldara and Iacoviello, 2022; Verwaal, 2017; Lampel and Bhalla, 2011). Recent examples of geopolitical disruptions include Covid-19, the US-China Trade War and the United Kingdom's departure from the European Union, or Brexit (Meyer *et al.*, 2023). Vaccine nationalism and the hoarding

of Personal Protective Equipment (PPE) by governments during the Covid-19 pandemic caused ruptures in global trade (Hitt *et al.*, 2021). The trade war between the United States and China led many multi-national companies to move production facilities and suppliers from China to Vietnam and Mexico to avoid customs duties (Handfield *et al.*, 2020). Brexit prompted many UK companies to relocate production facilities and distribution hubs from the UK to the European mainland to avoid new customs documentation requirements and expensive tariffs when rules of origin requirements were not met (Moradlou *et al.*, 2021; Roscoe *et al.*, 2020). The uncertainty that surrounded these disruptive events meant that many companies had no prior planning or mitigation strategy in place; exposing them to significant supply chain risks (van Hoek, 2020; Ivanov, 2020).

Geopolitical disruptions, such as the Ukraine war and disputes over the sovereignty of Taiwan (Meyer *et al.*, 2023), continue unabated, leading many scholars to question companies' myopic focus on locating production in low wage economies to reduce cost and gain supply chain efficiencies (Handfield *et al.*, 2020; van Hoek, 2020). Companies are now realizing the importance of balancing efficiency and flexibility in supply chains to manage ongoing geopolitical disruption risks (Sharma *et al.*, 2020). According to organisational learning theory (March, 1991) companies can simultaneously explore for new opportunities (flexibility) and exploit old certainties (efficiency), if certain conditions are met. This is the notion of organizational ambidexterity (Birkinshaw and Gupta, 2013), which refers to an organisations' ability to achieve both efficient and flexible operations simultaneously (Adler *et al.*, 1999). Organisational ambidexterity can be extended beyond the boundaries of the firm by partitioning the supply chain, where one supply chain focuses on delivering low cost commodity items, while another concentrates on delivering customized products quickly to consumers (Lee and Rha, 2016; Roscoe and Blome, 2019). These seemingly conflicting goals can be reconciled when production and distribution facilities are located in particular countries; either close to major markets to optimize flexibility, or in low wage economies to achieve cost advantages. By possessing a 'supply chain ambidexterity' capability a company is able to pursue supply chain exploitation (efficiency) and exploration (flexibility) outcomes simultaneously (Kristal *et al.*, 2010).

While existing studies have examined how companies structure supply chains to explore for new opportunities and exploit existing efficiencies (Aslam *et al.*, 2018; Gualandris *et al.*, 2018; Tamayo-Torres *et al.*, 2017), little research has considered how geopolitical disruptions influence supply chain ambidexterity. At the same time, the ways in which geopolitical disruptions affect global supply chain design, including the location of production and distribution facilities, remains an under researched topic. Addressing this knowledge gap is important because managers require an understanding of how to build ambidextrous supply chains to navigate today's highly uncertain geopolitical environment. This study draws on organisational learning theory and Dunning's eclectic paradigm to answer the question: *How do companies develop and deploy supply chain structural ambidexterity to effectively respond to geopolitical disruptions?* To answer this question, empirical evidence is gathered from 29 semi-structured interviews with senior executives working for multinational manufacturing companies affected by the uncertainties arising from the Covid-19 pandemic, US-China Trade War, and Brexit. Findings from the interviews are triangulated with secondary data sources including, company websites, annual reports, and industry publications.

Literature Review

When a firm considers where to locate its production and distribution facilities, it is confronted both with a governance (make or buy) and location decision (e.g., Tate and Bals, 2017; Foerstl *et al.*, 2016; Gray *et al.*, 2013; Dachs *et al.*, 2019).

Dunning's eclectic paradigm is particularly useful in understanding how location attractiveness influences supply chain configuration decisions. (Dunning, 1998, 2001) argues that MNEs will engage in relocating manufacturing facilities according to four factors: (1) resource-seeking advantage including the availability of raw materials, infrastructure and local talent/qualified personnel); (2) Market-seeking advantage including access to (growing) markets, proximity to customers and government's economic policies; (3) Efficiency-seeking advantage including manufacturing related costs and government incentives and; (4) Strategic asset-seeking advantage including focusing on core competencies, intellectual property protection and synergies related to maintaining a local presence (e.g. McIvor and Bals, 2021; Graf and Mudambi, 2005; Moradlou *et al.*, 2021). A location's attractiveness is relative to home country attractiveness, so either deteriorations in the host country or improvements in the home country can induce location changes (Baraldi *et al.*, 2018).

Organisational learning theory asserts that both exploitation and exploration strategies are essential for organisational success, but compete for limited resources (March, 1991). An exploration capability refers to companies' ability to scan the business environment and introduce innovative ideas to capitalise on novel opportunities (March, 1991). On the other hand, exploitation centres around cost reduction and efficiency enhancement through the standardisation of operations, continuous improvement, and the execution of ideas (March, 1991). An organisation's ability to pursue two conflicting activities at the same time has been called organisational ambidexterity (Birkinshaw and Gupta, 2013; Raisch *et al.*, 2009; Lunnan and Barth, 2003). Organisational ambidexterity allows companies to efficiently manage day-to-day activities and be responsive enough to change if disruptions impact daily operations (Gibson and Birkinshaw, 2004; Tamayo-Torres *et al.*, 2017). Constant *et al.* (2020) distinguish between four types of organisation ambidexterity; 1) contextual ambidexterity is where the same people combine exploration and exploitation activities in their daily routines; 2) sequential ambidexterity is where exploitation and exploration activities follow a sequential cycle; 3) managerial ambidexterity refers to a manager's behavioural orientation toward combining exploitation and exploration and; 4) structural ambidexterity refers to when firms develop two discrete and self-governing organizational units. This paper is particularly interested in structural ambidexterity, where companies manage the trade-offs between conflicting strategies by creating a dual structure, with one sub-unit focusing on exploitation whilst another focuses on exploration (Duncan, 1976).

The notion of organisational ambidexterity has been extended past a firms' internal boundaries to the supply chain (Blome *et al.*, 2013; Roscoe and Blome, 2019; Aslam *et al.*, 2018). Contrary to Fisher (1997), who believes that organisations should adopt efficient supply chains primarily for functional products and responsive supply chain for innovative products, ambidextrous supply chains are able to cope with flexible and efficiency trade-offs simultaneously (Rojo *et al.*, 2016). Roscoe and Blome (2019) explain that companies can apply the concepts of structural ambidexterity to the supply chain by maintaining an off-shore, centralized, manufacturing facility that focuses on low cost production, as well as a distributed manufacturing network that uses localized production facilities in major centres of demand for a flexible and quick response to consumer demands. Flexibility is enhanced by building a supply chain ambidexterity capability that extends beyond the buyer-supplier dyad, to the wider supply network (Rojo *et al.*, 2016). Efficiency is increased through enhanced buyer-supplier engagement in the development of standardized products and processes (Blome *et al.* 2013). By exploring the external marketplace to sense forthcoming changes and by exploiting existing efficiencies in operational processes, organizations can manage the often conflicting demands of flexible and efficient supply chains (Aslam *et al.* 2018). This is because supply chain ambidexterity acts as an enabler across quality, speed, flexibility and cost dimensions (Tamayo-Torres *et al.*, 2017).

Methodology

This research uses a theory elaboration strategy, which compares key theoretical concepts to empirical evidence to arrive at novel theoretical insights (Ketokivi and Choi, 2014). Gathering data from 14 manufacturing firms during geopolitical disruptions allowed the supply chain ambidexterity phenomena to be studied within the context of real-life events. By doing so, the study was situationally grounded which allowed us to reach theoretically informed propositions (Ketokivi and Choi, 2014). While the researchers were guided by *a priori* theoretical concepts, we kept open to the possibility of coming across unanticipated findings which might challenge existing theoretical constructs and allow for novel theoretical insights to be reached (Merton, 1968). We selected companies from a range of sectors, aerospace, automotive, chemical, fast moving consumer goods (FMCG), manufacturing and pharmaceutical 2) such that ambidexterity and location decisions could be studied in different contexts, accounting for sectoral differences. Companies were selected with headquarters in the UK or USA to reduce any variation in cultural norms. We ensured that the supply chains of all selected companies were impacted in some way by disruptions induced by the Covid-19 pandemic, the US-China trade war or Brexit.

We used semi-structured expert interviews to gather managers' perceptions of supply chain structural ambidexterity in response to geopolitical disruptions. While semi-structured interviews typically begin with a set of standardised questions, the researcher can ask pertinent follow-up questions to delve more deeply into the subject to understand why and how something occurs (Ahlin, 2019). To ensure interviewees had the necessary expertise, we sought the opinions of senior level managers with at least 10 years' experience, involvement in supply chain management roles, and with responsibility for making location decisions at a multinational level. The final list of informants were all responsible for making strategic supply chain decisions and had an average experience of 24 years and standard deviation of 7 years (see Table 2). The minimum experience was 14 years, and the maximum was 37 years. For all but 4 companies, an interview was conducted in each data collection phase providing a longitudinal element to the data and all sectors had at least one company where this was the case. In all instances, the findings from the interviews were triangulated with secondary evidence gathered from news outlets, company websites, annual reports, and industry publications, ensuring corroboration between the interview findings and secondary sources.

The interview transcripts were analysed using thematic analysis techniques (Braun and Clarke, 2006). The thematic analysis was based on pattern matching and explanation building logic (Braun and Clarke, 2006), where inductively derived descriptive codes from the literature were used to capture useful insights and overarching themes. The researchers followed the Gioia methodology (Gioia *et al.*, 2013) to inductively analyse the empirical evidence, including a 1st order analysis using informant-centric terms and a second order analysis using concepts, themes, and dimensions from organizational learning theory and the eclectic paradigm. Both Excel and NVivo 12 Plus was used to facilitate the coding and analysis process. The coding results across the 14 companies were compared, to establish common patterns which could be used to elaborate the theories in question.

Excerpts from the Findings

Building parallel supply chains

Interviewees explained how Brexit, the US–China trade war and Covid-19 triggered the reconfiguration of their supply chains. The location decision appeared to be particularly driven by market seeking and efficiency seeking advantages. For instance, in the case of Brexit and US-China trade war, an increase in tariffs and duties together with rules of origin requirements significantly impacted manufacturing and sourcing location decisions. As Brexit and the US-China trade war were demarcated by a series of political decision over a 5-year period, we

found that changes to global supply chains happened incrementally, over a number of years. According to FMCG3, their decision on where to locate production was based on making the company more flexible and fluid in response to disruptions:

“So you have to have the balance between; should we produce this product close to where it is being consumed or where the vendor is located if you need, so do we have to be close to a farmer or should we be close to a city where the dogs and pets are living, the market – so where to put your factory versus taking into account your network is not all about the duty you have to pay – it will entirely change your strategy around location and facility – so where we can, we will be flexible and fluid” (FMCG3. Senior Solutions Architect - Physical Logistics)

The above quote shows how the manufacturing location decision was influenced by improving the company’s responsiveness to major supply chain disruptions. The Vice President and Managing Director at CHEM1 discussed the exploitation and exploration opportunities presented as a result of geopolitical disruptions. He explained how Brexit highlighted issues around supply chain inefficiencies and how these were addressed by localizing production:

“What Brexit did was it shone a light on where we were inefficient in certain areas. ...we’ve found opportunities to localize products that we weren’t manufacturing in the UK ... so we started that process and bit by bit, you can see how products are moving through the localization process... So we had done 90% of that localization” (CHEM1, Senior Vice President and Managing Director)

Reconfiguration of supplier networks

Motivated by resource seeking and efficiency seeking advantages, we found that companies tried to achieve the synergistic benefits of exploration and exploitation by reconfiguring their supplier networks. To do so, various subunits in a company would explore the opportunities for sourcing raw material or components based on new criteria (e.g., lead time, flexibility, and responsiveness) in different geographical locations. Some companies initially started by exploiting their existing supplier network. For instance, FMCG2 planned to investigate their plants based in the US, Kenya and South Africa before exploring other alternatives. The Head of International Markets at FMCG2 explains this as follows:

“The second issue is our contingency ability in trying to increase connectivity with our wider network – i.e., we have plants in the US and Kenya and South Africa and they are not as effective or efficient as the plant in the UK, but that is probably what we will look at next before anything else and if both of these prove to be not effective enough we will explore other options.” (FMCG2, Head of International Markets)

Meanwhile other companies strategized to diversify their supply base for certain products whilst maintaining their existing supply chains to mitigate the risks of increased costs. For instance, at CHEM1, rather than internalising the production of specialised products that were not financially worthwhile, the company explored the use of contract manufacturers to improve responsiveness by turning production on and off based on market demand signals. These contract manufacturers had location advantages according to the availability of raw materials and proximity to the customer. Similarly, AUTO1 planned to explore their sourcing options in other regions for commodity products:

“Depending on the location and the region and the commodity and the tariffs paid today and in the case of the US/China example the future tariffs – we have and will continue to actively explore options in other regions for the same commodity...” (AUTO1, Director of Global Purchasing)

Restructuring internal subunits

We found that the development of parallel supply chains and reconfiguration of supply networks required structural partitioning between business units within the firm, primarily due to strategic asset seeking and efficiency seeking advantages. For instance, during the pandemic, CHEM1 introduced night shifts to manufacture certain product lines, which were structurally separated from existing product lines, to meet surges in demand. This gave the company the structural flexibility to reallocate its workforce and generate spare capacity to respond to fluctuation in demand once the surge has passed. Whilst this reinforces the tendency toward exploitation (using its already existing resources), the new setup facilitated the flexible use of a temporary workforce by accessing local talent. The Senior Vice President and Managing Director at CHEM1 explains this as follows:

“If there's surge in request then we've got a very agile supply chain that can react to that and a very good workforce to do that, but we only use that when we get these surges that we can split the skilled staff across, you may work a night shift two weeks and then get two weeks off and you're rotated, so it's working with people, what suits them, rather than enforced to work six weeks of nights, it's on a rotational basis that people respect it and work around, however it's not the norm to work night shifts.” (CHEM1, Senior Vice President and Managing Director)

Discussion

We find that in situations of high uncertainty, organisations go through rapid decision-making processes with regards to their exploration and exploitation activities, often under very tight timelines. Unlike sequential ambidexterity, we discovered that various decisions, both in terms of the facility location and suppliers' location, were made at the immediate onset of the disruptive event to manage the efficiency and flexibility/responsiveness of production. These findings suggest that, during the early stages of geopolitical disruptions where information is rapidly changing and outcomes are highly uncertain, companies will tend towards structural ambidexterity as opposed to sequential ambidexterity to manage uncertainty.

Proposition 1: During the early stages of major geopolitical disruptions, exploitation and exploration activities are pursued simultaneously, with decision-making taking place within cross-functional teams.

Our empirical evidence indicates that companies engaged in exploration and exploitation by engaging in three types of supply chain structural ambidexterity. First, we identified that companies developed parallel supply chains by transitioning from a purely offshored, centralized, supply chain design to pursuing a localisation strategy. These companies appeared to be motivated by market seeking advantages, because they segmented their production lines into local, regional, and global manufacturing facilities based on changing customer demand profiles, proximity to customers and product-line characteristics.

Proposition 2: Companies will be motivated by market seeking and efficiency seeking advantages to build parallel supply chains in response to major geopolitical events with longer transition times.

The second method of achieving supply chain structural ambidexterity was through the reconfiguration of the supplier network. Prompted by resource seeking motives, we found that companies engaged in strategies such as dual sourcing and supply base diversification to exploit the cost advantages associated with high volume, repetitive routines tasks whilst simultaneously exploring for new suppliers of non-critical components. Our empirical data

suggests that the reconfiguration of supplier networks was pursued during all three geopolitical disruptions, regardless of the amount of available response time. This leads us to propose that:

Proposition 3: During major geopolitical disruptions, companies are driven by resource seeking and efficiency seeking motives to reconfigure their supplier networks to achieve the synergistic benefits of exploitation and exploration, regardless of the transition time.

We find that companies restructured their internal functions by investing in new technologies such as supply chain control towers, removing silos in decision making, and enhancing knowledge sharing/learning between employees. This was particularly the case during the sudden onset of the Covid-19 pandemic.

Proposition 4: During major geopolitical events with shorter transition times, companies are driven by strategic asset seeking and efficiency seeking motives to restructure internal subunits.

Drawing together the above four propositions, we now advance an empirically informed framework (see Figure 1) to illustrate three types of supply chain structural ambidexterity.

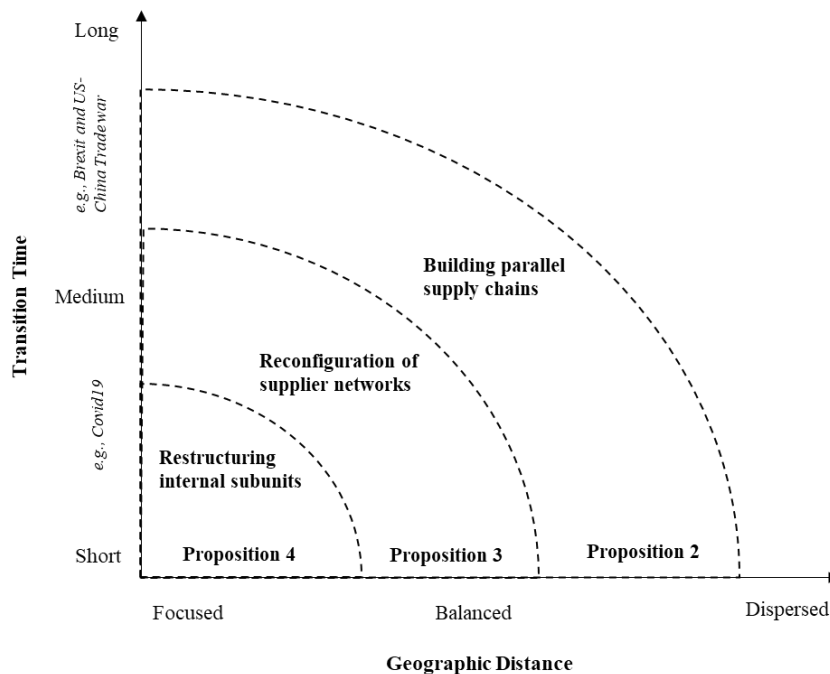


Figure 1 – Three Levels of Supply Chain Structural Ambidexterity

Conclusion

Our findings contribute to organisational learning theory and Dunning’s eclectic paradigm by showing that different variations of supply chain ambidexterity emerge according to the transition time available to firms and the geographical dispersion of the supply base. When shorter transition times are available, companies are driven by strategic asset-seeking and efficiency-seeking motives to restructure their internal subunits. When longer transition times are available, companies are motivated by market seeking and efficiency seeking advantages to build parallel supply chains that are independently dedicated to flexibility or efficiency objectives. Finally, we find that, regardless of the transition times, companies are driven by resource seeking and efficiency seeking motives to reconfigure supplier networks to achieve exploitation and exploration benefits.

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