

## **Redesigning global supply chains during compounding geopolitical disruptions: The role of supply chain logics**

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**Purpose:** *Why do managers redesign global supply chains in a particular manner when faced with compounding geopolitical disruptions?* In answering this research question, our study identifies a constrained system of reasoning (decision-making logic) employed by managers when they redesign their supply chains in situations of heightened uncertainty.

**Design/methodology/approach:** We conducted 40 elite interviews with senior supply chain executives in 28 companies across nine industries from November 2019 to June 2020, when the United Kingdom was preparing to leave the European Union, the US-China trade war was escalating, and Covid-19 was spreading rapidly around the globe.

**Findings:** When redesigning global supply chains, we find that managerial decision-making logic is constrained by three distinct environmental ecosystem conditions: 1) the perceived intensity of institutional pressures; 2) the relative mobility of suppliers and supply chain assets, and; 3) the perceived severity of the potential disruption risk. Intense government pressure and persistent geopolitical risk tend to impact firms in the same industry, resulting in similar approaches to decision-making regarding supply chain design. However, where suppliers are relatively immobile and supply chain assets are relatively fixed, a *dominant* logic is consistently present.

**Originality/value:** Building on an institutional logics perspective, our study finds that managerial decision-making under heightened uncertainty is not solely guided by institutional pressures but also by perceptions of the risk of supply chain disruption and immobility of supply chain assets. These findings support the theoretical development of a novel construct that we term ‘supply chain logics.’ Finally, our study provides a decision-making framework for Senior Executives competing in an increasingly complex and unstable business environment.

**Key Words:** Covid-19, Brexit, US-China trade war, strategy development, institutional theory, supply chain design, supply chain logics

## 1. Introduction

Major geopolitical disruptions, including Brexit, the US-China trade war and Covid-19, have fundamentally changed global supply chain designs (Handfield et al., 2020; Nikookar & Yanadori, 2022). Geopolitical disruptions are defined as “risks associated with wars, terrorist acts, and tensions between state actors that affect the normal and peaceful course of international relations” (Caldara & Iacoviello, 2018 p. 2). In 2016, The UK voted to break ties with its largest trading partner, the EU, reversing 40 years of market and regulatory integration (Roscoe et al., 2020). Risks associated with unfavorable outcomes of Brexit negotiations led several UK companies to set up new production facilities in Europe to avoid border delays and ensure regulatory compliance (Moradlou et al., 2021). In 2018, President Trump initiated a

trade war with China, pitting two of the world's largest economies against one another, with the stated objective of 'repatriating' production to the USA (Charpin et al., 2020). Fifty multinational companies, including Apple, Nintendo, and Dell, announced they were changing suppliers and shifting production out of China due to the risk of increased duties and tariffs (Zhang et al., 2020). Then, from December 2019 onwards, the Covid-19 pandemic emerged, exacerbating tensions between nation-states (Kano & Oh, 2020; Sodhi & Tang, 2021; Verbeke, 2020). It was not the Covid-19 virus that closed borders and shut down production, but rather the mandates of national and local governments (van Hoek, 2020). Covid-19 became a geopolitical disruption event when governments hoarded vaccines and critical medicines for their citizens before shipping products to other countries in need (Finkenstadt & Handfield, 2021). Managers were left to weigh the risk of global trade lanes being disrupted as suppliers, production facilities, and ports were put under lockdowns by governments at short notice due to a Covid-19 outbreak.

While companies may have withstood one of these events in isolation, the compounding pressures and risks resulting from all three events have led many companies to reconsider global supply chain designs (Handfield et al., 2020). Supply chain design is defined as the decisions made regarding the number and location of production and warehousing facilities, the selection of suppliers, the amount of capacity at each facility, the assignment of market regions to those facilities, and the selection of transportation modes (Chopra & Meindl, 2016 p. 108). Recent studies have examined *how* firms alter their supply chain designs during disruptive events, using techniques such as building buffer inventory (Alikhani et al., 2021), collaborating with supply network partners (Azadegan & Dooley, 2021), and using real-time detection and monitoring technology to increase supply chain visibility (Belhadi et al., 2021; Queiroz et al., 2020). Other studies have examined *where* companies have relocated their suppliers and production facilities using localized and regionalized supply chain designs (Shih,

2020; van Hoek, 2020). A clear gap in the research is an understanding of the decision-making logic behind *why* managers redesign their supply chains when faced with compounding geopolitical disruptions. In addressing this gap, we seek insights into the question: *Why do managers redesign global supply chains in a particular manner when confronted by compounding geopolitical disruptions?*

We examine this question through the lens of institutional theory (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Scott, 2014) and the institutional logics perspective (Greenwood et al., 2010; Thornton et al., 2012). Empirical data are gathered from 40 interviews with senior supply chain executives in nine industries during a period of extreme geopolitical disruption: November 2019 to June 2020. During this period, the UK was exiting the European Union, the US-China trade war was in full swing, and Covid-19 was rapidly spreading around the globe. The interview findings were triangulated with secondary data collected from company financial statements, annual reports, and websites. The diversity of management approaches encountered in our analysis suggests that a set of decision-making logics help explain why supply chain designs are reconfigured in particular ways in the context of compounding geopolitical disruptions. Our analysis further revealed that differences in logically consistent decisions arose due to three constraining dimensions: 1) the perceived intensity of institutional pressures; 2) managerial perceptions of the severity of geopolitical disruption risk, and; 3) the relative mobility of the supply base and supply chain assets. These findings underpin the development of a novel construct we term ‘supply chain logics’. Eight supply chain logics were found to inform managerial decision-making when redesigning supply chains. After defining these supply chain logics in greater detail, the paper concludes by providing a decision-making framework for Senior Executives redesigning supply chains in an increasingly complex and unstable business environment. The results offer fertile ground for ongoing research in applying supply chain logics under conditions of extreme uncertainty.

## **2. Theoretical Underpinnings**

### *2.1 Institutional Theory and Institutional Logics*

Early writings on institutional theory assert that the motives of human and organizational behavior extend beyond profit maximization to social justification and social obligation (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Powell & DiMaggio, 1991). External pressures, including normative, coercive, and mimetic, were posited to lead to organizational homogeneity, as firms adopt similar structures and processes as a means of reducing uncertainty and achieving legitimacy (DiMaggio & Powell, 1983). Since these early writings, organizational scholars have challenged institutional theory's presumption of isomorphism and homogeneity amongst firms (Greenwood et al., 2010; Greenwood & Hinings, 1996; Oliver, 1991, 1997). These scholars observed that institutional pressures are not evenly applied across all organizations and industries and that organizations face multiple and sometimes conflicting pressures (Friedland and Alford, 1991; Oliver, 1991). The unevenness of institutional pressures leads to different paths for decision-making—it informs institutional logics, or the cultural beliefs and norms that structure cognition and guide managerial decision making (Lounsbury, 2007). Institutional logics are defined as: 'socially constructed, historical patterns of material practices, assumptions, values, beliefs, and rules by which individuals produce and reproduce their material subsistence, organize time and space, and provide meaning to their social reality' (Thornton & Ocasio, 1999 p. 804). Logics motivate organizations to act in a socially acceptable way, leaving managers with a constrained basket of choices when making decisions and formulating strategy (Friedland & Alford, 1991; Greenwood et al., 2010).

Logics focus the attention of key decision-makers on a delimited set of issues and solutions (Thornton & Ocasio, 1999), leading to logically consistent decisions that reinforce existing organizational identities and strategies (Thornton, 2002). As institutional pressure varies by industry, multiple and often conflicting logics may be present within an organization,

leading to different potential avenues for decision making and heterogeneity in organizational structures (Greenwood et al., 2010; Lounsbury, 2007; Oliver, 1991). Organizations can embody two or more logics in a relatively compatible fashion, and these logics may ultimately blend to create new organizational forms (Rao et al., 2005). The institutional logics perspective proves helpful in understanding managers' decision-making process when redesigning global supply chains.

## *2.2 Supply Chain Design Decisions*

Supply chain design decisions are strategic and long-term, and typically expensive to alter at short notice (Ivanov, 2020; Speier et al., 2011). Scholars tend to examine these decisions according to *where* companies locate manufacturing, warehousing, and distribution facilities (Beamon, 1998; Speier et al., 2011). For example, decisions regarding offshoring, onshoring/re-shoring/back-shoring, and nearshoring are essentially about *where* production facilities are located in relation to the focal firm's home market (Ellram et al., 2013; Mcivor, 2013).

Offshoring, made popular in the 1970s and 80s, saw many Western firms move manufacturing to low-wage economies due to competitive pressures and political forces that reduced barriers to entry into foreign markets (Contractor et al., 2010). Western firms established extensive, centralized production facilities in countries such as China to save on labor costs and exploit economies of scale (Gereffi, 2018). In recent years, significant supply chain disruptions have challenged the conventional wisdom of offshored, centralized production (Panwar, 2020; Shih, 2020; van Hoek, 2020). Indeed, the rapid spread of COVID-19 has threatened the very nature of globalization, with companies increasingly nearshoring and onshoring production (Barbieri et al., 2020; Panwar, 2020; Strange, 2020). Nearshoring has led to the 'regionalization' of supply chains, where companies locate production facilities in lower-wage economies, close to major centers of demand (Hartman et al., 2017; Tate, 2014).

Onshoring, reshoring, and back-shoring have led to the ‘localization’ of supply chains, where companies relocate production and supply to home markets to offer a quick response to customer requests while reducing the risks of supply chain disruptions (Hansen et al., 2017; Tate and Bals, 2017a).

### *2.3 Managing Supply Chain Disruption Risks*

There are two broad categories of risk affecting supply chain designs: 1) risks arising from the problems of coordinating supply and demand and; 2) risks arising from disruptions to normal activities (Kleindorfer & Saad, 2005). This paper focuses on disruption risks, including operational risks (equipment malfunctions, production issues, strikes, and fraud) and risks arising from natural hazards, terrorism, and political instability (Ivanov & Dolgui, 2019; Kleindorfer & Saad, 2005). We are particularly interested in geopolitical disruption risks, which encompass disruptions to normal supply chain operations resulting from instability, tensions, and direct conflict between nation-states (Hansen et al., 2017; Moradlou et al., 2021; Roscoe et al., 2020). When confronted with geopolitical disruptions, managers are likely to respond to risks in different ways (Jüttner et al., 2003; Sitkin & Weingart, 1995; Zsidisin, 2003). One manager may see political turmoil as problematic and relocate manufacturing facilities, while another manager may see an opportunity and extend the capacity of existing facilities (Hansen et al., 2017; Sitkin & Weingart, 1995). This difference in approach suggests it is not the risk itself that prompts changes in supply chain design but a manager’s perception of how severely the risk will disrupt operations (Jüttner et al., 2003; Zsidisin, 2003). We adopt the definition of risk from March and Shapira (1987) and apply it in the context of supply chains: “*risk is the variation in the distribution of possible [supply chain] outcomes, their likelihood, and their subjective values*” (p. 1404). This definition suggests that risk is a subjective concept: moreover, this view emphasizes that the perception of risk influences decision-makers' risk-taking behavior (March & Shapira, 1987; Sitkin & Weingart, 1995).

Scholars that examine geopolitical disruptions have primarily focused on *how* firms build resilience in the supply chain to effectively manage disruption risk (Barbieri et al., 2020; Belhadi et al., 2021; Ivanov, 2020). For example, Roscoe et al. (2020) explained how companies managed the uncertainty created by Brexit using wait-and-see, reactive, and proactive risk mitigation strategies. Other scholars examined how vertical and horizontal collaboration between supply chain actors can build resilience by working with policy-makers to shape future trading relationships (Hendry et al., 2019). A study on the US-China trade war by Charpin et al. (2020) explained how foreign subunits operating in China use supplier development to increase legitimacy with the host government and enhance resilience. Zhang et al. (2020) discuss how major US multinationals moved production facilities out of China to build strength against tariff fluctuations. Similarly, studies on the Covid-19 pandemic examine how companies mitigate geopolitical disruptions using resilience tools such as supply chain mapping (Choi et al., 2020), combining lean and resiliency elements in an operation (Ivanov and Dolgui, 2019; Queiroz et al., 2020), and building digital connectivity, visibility, and continuity in the supply chain (Nikookar & Yanadori, 2022; Zhang et al., 2020). Managers are encouraged to build supply chain resilience systems that can recover to a normal state after a disruption while harnessing adaptation and transformation capacities (Queiroz et al., 2022; Ruel et al., 2021; Wieland & Durach, 2021).

This body of literature considers *how* companies manage geopolitical disruption risks by building resilience. At the same time, the supply chain design literature concentrates on *where* companies relocate production and supply during major geopolitical upheavals. Our study contributes to the current literature by identifying the decision-making logic behind *why* companies redesign supply chains in a particular manner when confronted by compounding geopolitical disruptions. The following section outlines the research design used to answer the research question of interest.



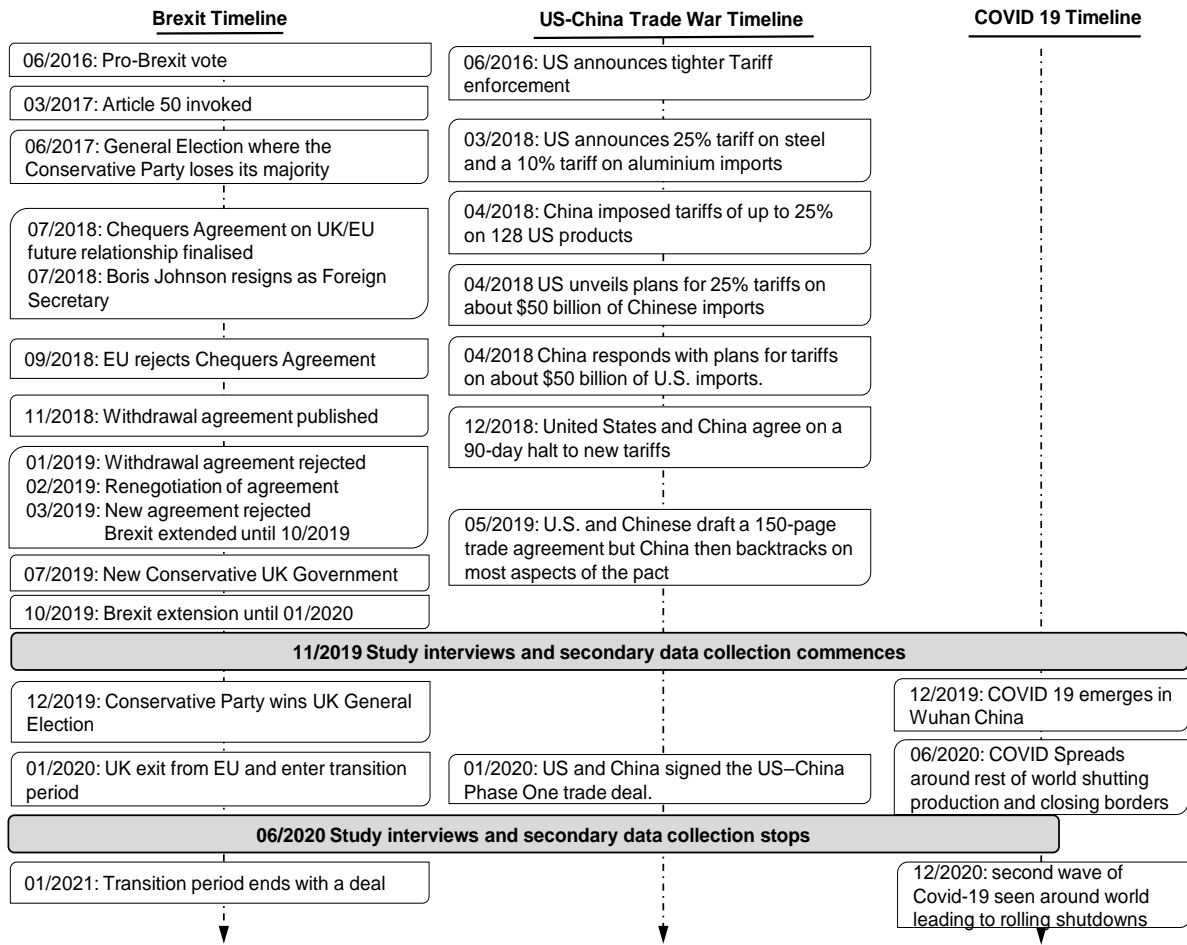
### **3 Methodology**

#### *3.1 Research Design*

We employed a theory-building approach that began with a research question and evolved over the period of data collection as global events unfolded (Fisher & Aguinis, 2017; Ketokivi & Choi, 2014). Our unit of analysis is the supply chain decision-maker, so we used an elite interview research design (Aberbach & Rockman, 2002; Alexander et al., 2018) to gather decision-makers' perceptions of risk and reasoning behind redesigning their supply chain in a particular way. We used a theoretical sampling approach to select the interviewees for our study based on defined criteria (Eisenhardt, 1989). To minimize variation in cultural norms and capture the global nature of supply chain design decisions, we only included multinational enterprises (MNE). Finally, we selected companies that experienced a material impact on their supply chain due to either Brexit, the US-China trade war, Covid-19, or all three disruptions.

#### *3.2 Data Collection*

Interview data were collected from November 2019 to June 2020. Using elite interviewing techniques, we interviewed 40 supply chain executives working for MNEs across nine sectors: automotive, chemical, clothing/apparel, consumer goods, heavy engineering, manufacturing (aerospace, furniture, medical instruments), oil & gas, pharmaceutical, and technology (including consumer electronics). Figure 1 provides the timeline for our data collection effort on the timeframe of Brexit, the US-China Trade War, and Covid-19.



**Figure 1: Geopolitical disruption event timeline and relation to data collection efforts**

We vetted the job description of the interview participants to check whether they were knowledgeable about the supply chain design decisions made in their company. We confirmed informant eligibility through an initial consultation with each interviewee by using qualifying questions on the risk factors expected from Brexit, the US-China trade war, Covid-19, and the impact on supply chain design. Where possible, we included multiple informants, shown as a, b, and c in the interviewee column in Table 1.

**Table 1: Interview participants, company profiles, countries, and geopolitical disruption context**

<b>Interviewee</b>	<b>Sector</b>	<b>Number of Employees</b>	<b>Turnover</b>	<b>Interviewee Role</b>	<b>Geography</b>	<b>Geopolitical Disruption Context</b>
Auto1	Automotive	43,224	\$31.8B	Global Supplier Technical Assistance and Programs Director	UK	Brexit / USA-CN Trade War
Auto2	Automotive	3,798	\$1.6B	Head of Logistics Engineering and Future Solutions	UK/Europe/ Rest of the World	Brexit / COVID-19
Auto3a	Automotive	67,000	\$9.7B	Executive Vice President, Merchandising and Operations Support	US	USA-CN Trade War
Auto3b	Automotive	67,000	\$9.7B	Vice President, Brakes and Chassis	US	Brexit / USA-CN Trade War
Chem1	Chemical Industry	47,000	\$18.5B	Marketing Head for the UK and Ireland	UK/Ireland	Brexit / USA-CN Trade War / COVID-19
Chem2	Chemical Industry	47,300	\$13.4B	EMEA Refinish Supply Chain & Logistics Operations Director	UK/Europe	Brexit / USA-CN Trade War / COVID-19
Cloth1	Clothing	215,000	\$16.2B	Vice President, Global Manufacturing & Distribution	US	Brexit / USA-CN Trade War
Cloth2	Clothing	40,000	\$9.9B	Executive VP in the Supply Group	US	General
Cloth3	Clothing	75,000	\$13.8B	Senior Director, Customs and Trade Strategy	US	USA-CN Trade War
FMCG1	Consumer Goods	100,000	\$35B	Business Process Owner - Physical Logistics	UK/Europe	Brexit/USA-CN Trade War / COVID-19
FMCG2	Consumer Goods	352,000	\$95B	Head of Procurement	UK/Ireland	Brexit/USA-CN Trade War
FMCG3	Consumer Goods	2,000	\$373.8M	Head of International Markets	UK	Brexit/USA-CN Trade War
HE1	Heavy Engineering	55,000	\$16B	Head of Engineering and Compliance	UK/France	Brexit
HE2a	Heavy Engineering	40,268	\$8.14B	Procurement Business Manager	UK	Brexit
HE2b	Heavy Engineering	40,268	\$8.14B	Engineering Director	UK	Brexit
HE2c	Heavy Engineering	40,268	\$8.14B	Supply Chain Director	UK	Brexit
HE3	Heavy Engineering	3,000	\$240M	Director	UK	Brexit
HE4	Heavy Engineering	1,000	\$500M	Managing Director Services and Technical Products	UK/Europe	Brexit
HE5	Heavy Engineering	6,500	\$2.6B	Solutions Director EMEA	UK/Europe/ Middle East	Brexit/USA-CN Trade War / COVID-19

<b>Interviewee</b>	<b>Sector</b>	<b>Number of Employees</b>	<b>Turnover</b>	<b>Interviewee Role</b>	<b>Geography</b>	<b>Geopolitical Disruption Context</b>
Man1	Manufacturing (Aerospace)	50,000	\$16.6B	Concept Engineering and Technical Specialist	UK	Brexit
Man2	Manufacturing (Furniture)	193	\$59M	Strategic Sourcing Specialist	UK	Brexit/USA-CN Trade War / COVID-19
Man3 (2 interviews)	Manufacturing (Medical Instruments)	70,000	\$24.36B	Director, Logistics Procurement & Strategy Pharma Services	US	Brexit/USA-CN Trade War
Man4	Manufacturing (Aircraft)	85,800	\$22.6M	Commercial and Procurement Director	US	General
OG1a	Oil and Gas	989	\$1.7B	Supply Chain Director	UK	Brexit
OG1b	Oil and Gas	989	\$1.7B	Operations Director	UK	Brexit
OG2	Oil and Gas	100,000	\$32.8B	Head of Supply Chain	UK/Europe	Brexit
OG3 (2 interviews)	Oil and Gas	1,372	\$2.7B	Senior Supply Chain Management Specialist	US	Brexit/USA-CN Trade War
Phar1a	Pharmaceutical	42,100	\$18.2B	Corporate Vice President Supply Chain	UK/Europe/Rest of World	Brexit/USA-CN Trade War
Phar1b	Pharmaceutical	42,100	\$18.2B	Director, New Product Launch, Supply Chain Planning	UK/Europe/ Rest of World	Brexit/USA-CN Trade War
Phar2 (2 interviews)	Pharmaceutical	99,437	\$21.7B	Global Head of Logistics for Pharma	UK/Europe/ Rest of World	Brexit / COVID-19
Phar3	Pharmaceutical	520	\$95.6M	Executive Operations Director	UK/Europe	Brexit / COVID-19
Tech1	Technology	157,000	\$92.15B	Director – Sales and Operations Planning	US	USA-CN Trade War
Tech2	Technology	385,000	€96.5B	Vice President, Procurement	US	USA-CN Trade War
Tech3 (2 interviews)	Technology	200,000	\$25B	Senior Advisor	US	USA-CN Trade War
Trade Org1	Trade Organization	NA	NA	Board Director	US	Brexit/USA-CN Trade War
Trade Org2	Trade Organization	NA	NA	Expert Practitioner and Fellow	US	Brexit/USA-CN Trade War

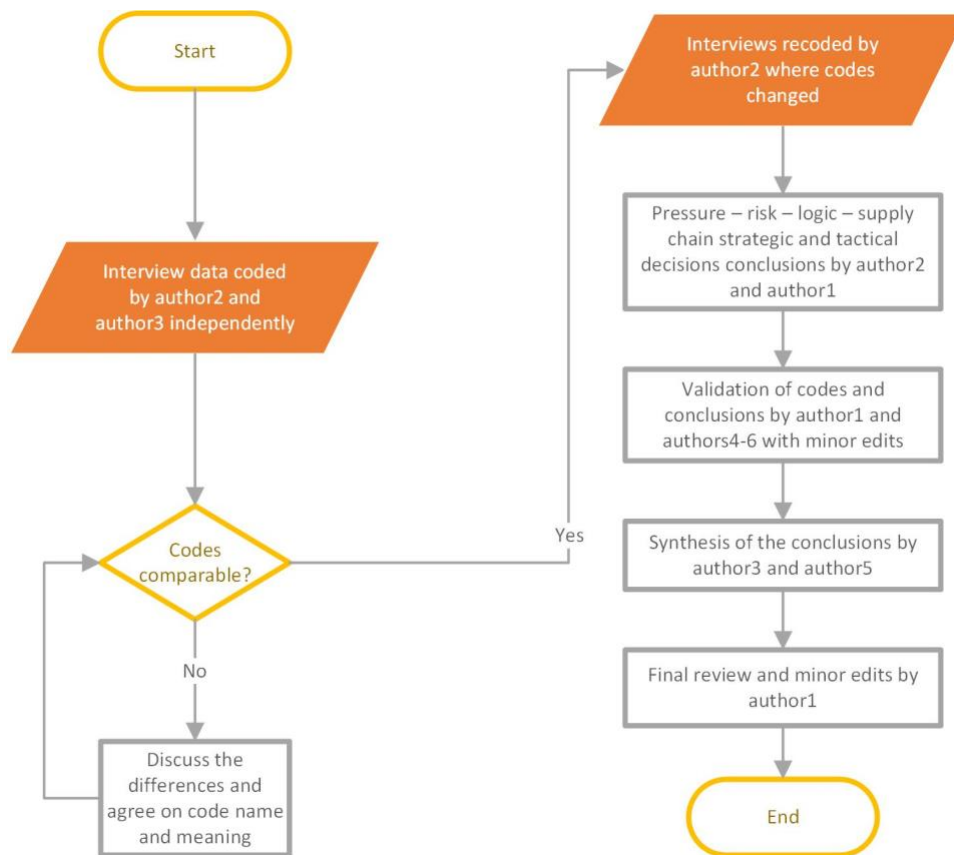
The interview findings were validated with secondary data from company websites, news outlets, internet sites, annual reports, and industry publications. Secondary data provided confirmatory evidence of claims made by interviewees, such as whether the company was considering the movement of production facilities or new sources of supply. The interview protocol is shown in the appendix.

The interviewees represented a balanced sample of the three geopolitical disruptions; 31% of the interviewees commented on risks and pressures originating from both Brexit and the US-China trade war, 23% focused solely on Brexit, and 13% focused solely on the US-China trade war, while 25% discussed the impact of Covid-19. While interpreting these percentages, the reader is invited to appreciate that the data collection did not entirely overlap with the evolution of the pandemic. Brexit did not apply to all MNEs interviewed. Similarly, the US-China trade war did not apply to all MNEs interviewed. While producing results from our sample and data, we observed different geopolitical risks applicable to our respondents, which helps with the generalizability of our conclusions. Each interview lasted between 45 minutes and 1 hour, and the names and companies of the interviewees were anonymized. We concluded that after 40 interviews, a point of theoretical saturation had been reached as no further insight, new knowledge, or additional learning emerged from the data (Lee, 1999).

### *3.3 Data Analysis*

We followed the Gioia methodology of rigorous qualitative data analysis, including a 1<sup>st</sup> order analysis using informant-centric terms and codes and a 2<sup>nd</sup> order analysis using researcher-centric concepts, themes, and dimensions (Gioia et al., 2012). During the 1<sup>st</sup> order analysis, two of the authors coded interviews independently, then compared their codebooks to agree upon definitions. The authors gave each category a label and descriptor independently, retaining the informants' terms to ensure inter-rater reliability (Armstrong et al., 1997). When codes differed, the differences were discussed, and agreement was reached on a code name and

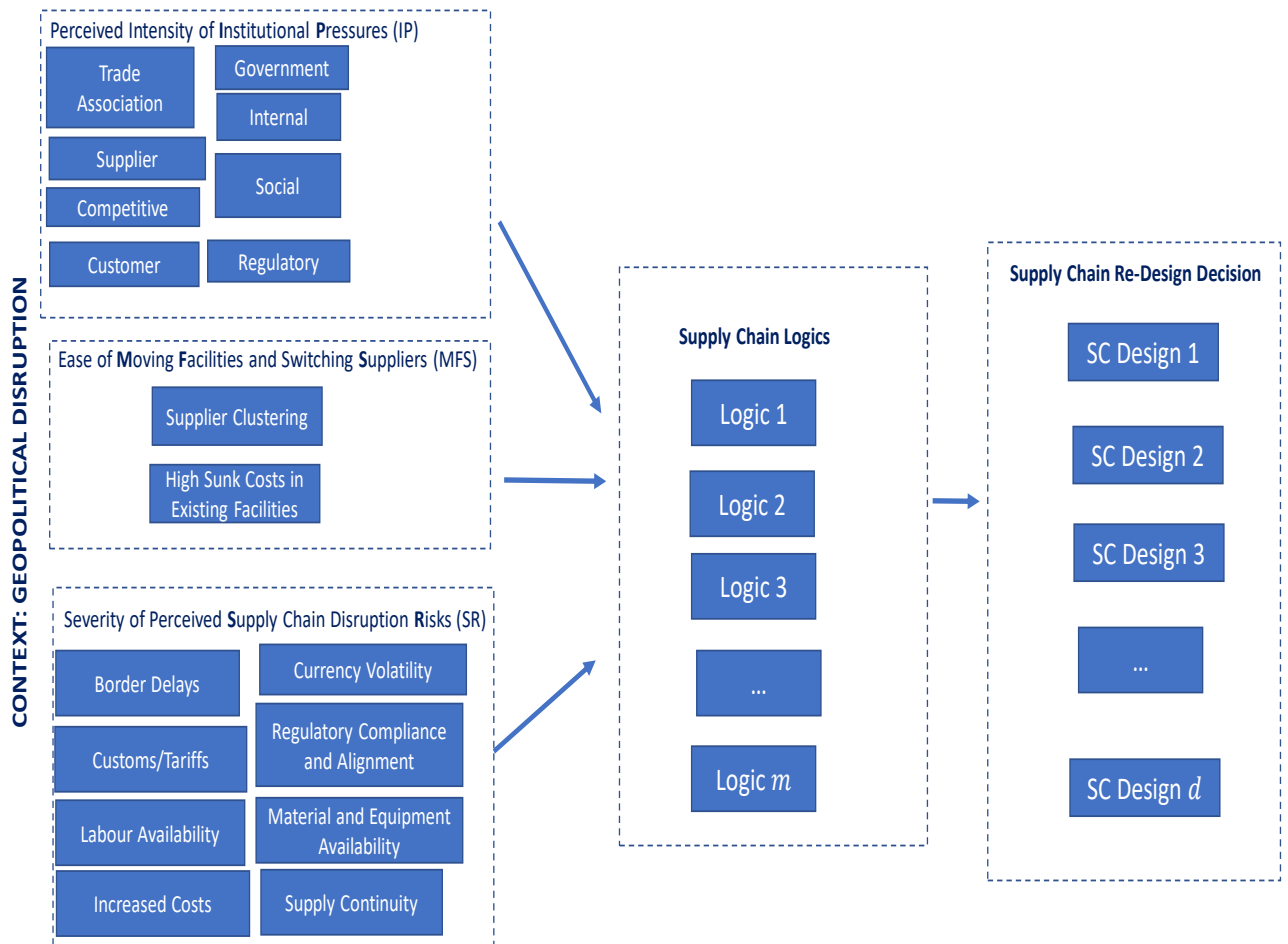
meaning. Some codes were merged and reorganized under 1<sup>st</sup> order coding categories during this comparison to increase clarity (Figure 2).



**Figure 2: Data Analysis Procedure**

During the 2<sup>nd</sup> order coding, the two authors discussed the initial coding template. They asked whether the emerging themes suggested concepts from the literature that might help describe and explain the phenomenon under investigation. At the same time, the authors remained open to new and emerging ideas not adequately addressed by the literature and institutional theory. The coded interviews suggested that three interrelated factors primarily influenced managerial decision-making when redesigning supply chains: 1) the perceived intensity of institutional pressure, 2) the ease of moving supplier and supply chain assets, and 3) the perceived severity of geopolitical disruption risk. These three factors led to the emergence of what we term ‘supply chain logics’, explained in greater detail in the discussion section. We found that these

decision-making logics influenced the type of supply chain design that a firm chose to adopt (see Figure 3).



**Figure 3: Relationship between research concepts**

The resulting data structure shown in Figure 4 explains how the coders progressed from raw data to 1<sup>st</sup> order concepts to 2<sup>nd</sup> order themes of supply chain logics. The color-coding shows the perceived intensity of institutional pressures, the perceived severity of geopolitical disruption risks, and the ease of moving supplier and supply chain assets.

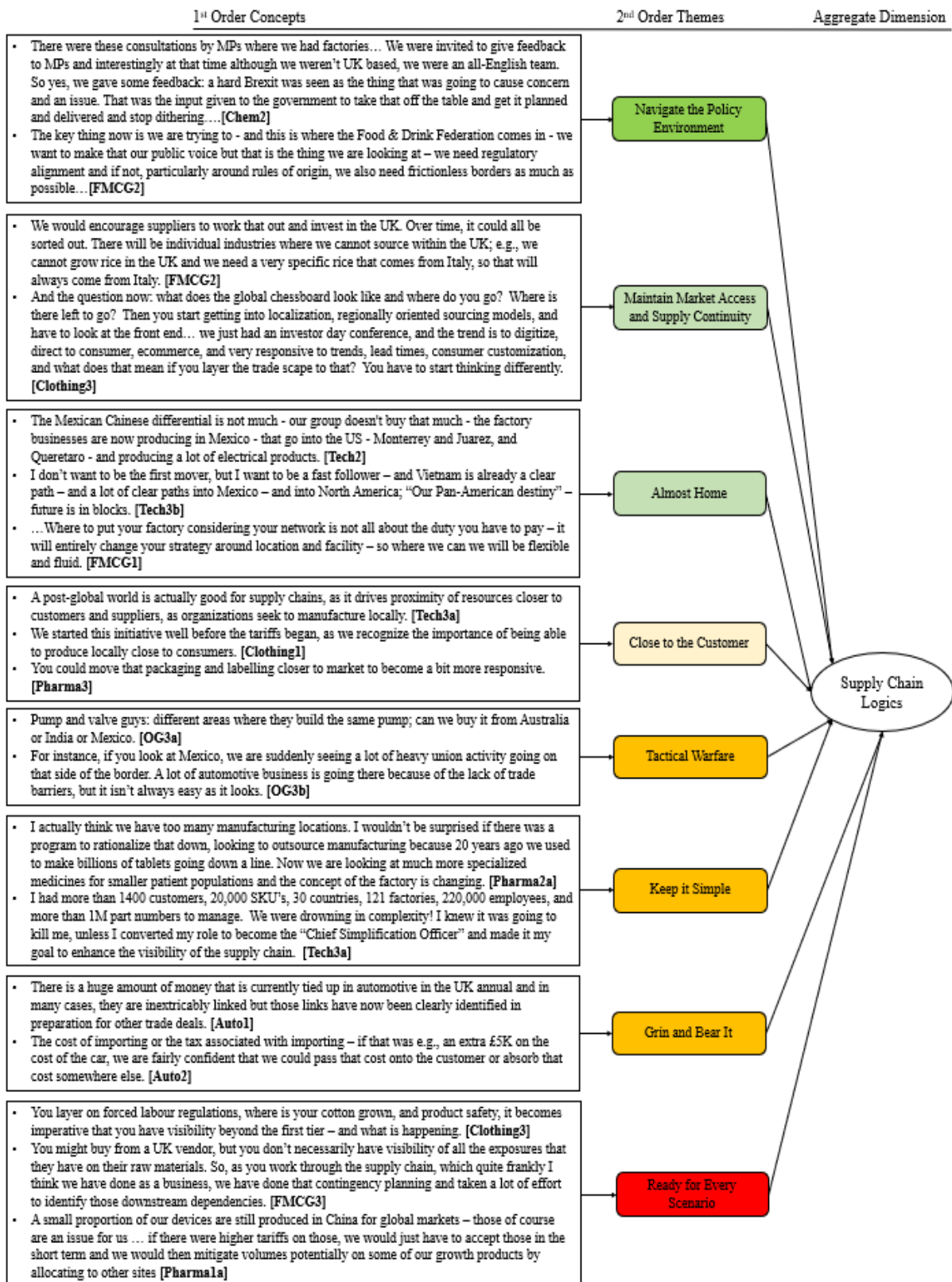


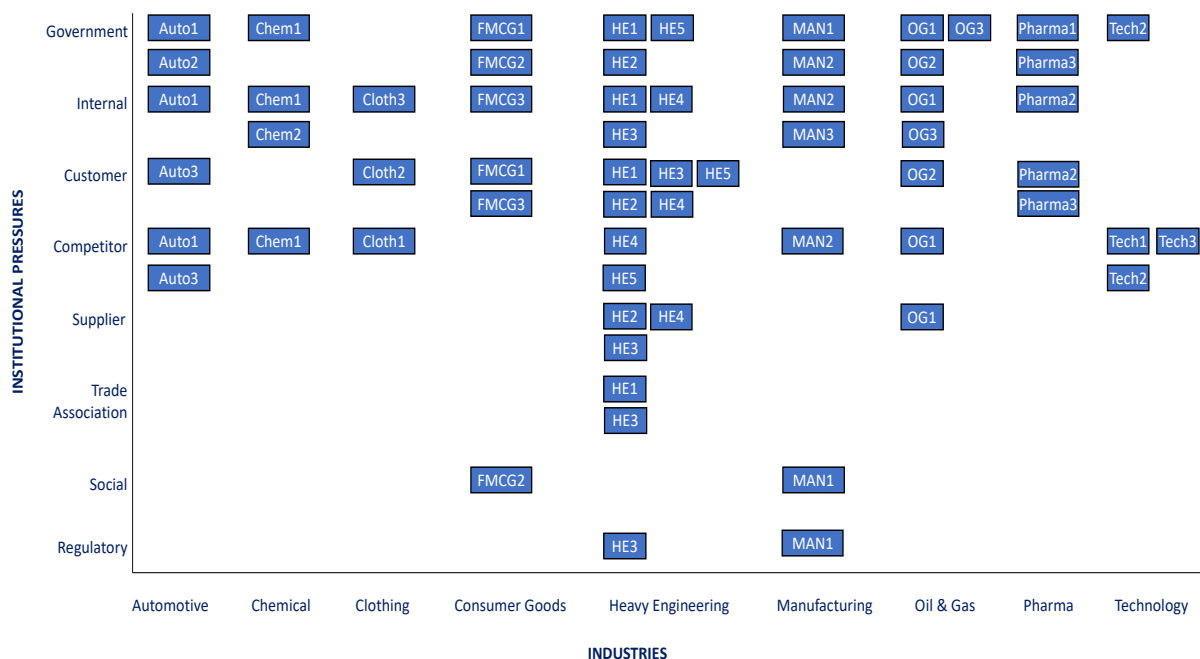
Figure 4: Data structure illustrated for supply chain logics



## 4. Findings

### 4.1 Perceived Severity of Institutional Pressures

Interviewees discussed how Brexit, the US-China trade war, and Covid-19 led to intensified pressures from customers, competitors, suppliers, trade associations, and regulators (see Figure 5). Internal pressures affected most companies in our study and were exerted by senior managers or individuals in other internal departments to alter supply chain design during major geopolitical events.



**Figure 5: Perceived intensity of institutional pressures by industry**

Intense government pressure was particularly prominent as an influence on decision outcomes. A telling example is how the UK government demanded that pharmaceutical companies hold six weeks of stocks on all drugs manufactured in the EU in the event of a no-deal Brexit as articulated by the Corporate VP of Supply Chain at PHAR1:

“Yes, we are getting pressure from the UK government who are very worried about stock levels, and there was the pressure to make sure we had a plan in place and adequate stock levels, and they asked us to increase our stock policies to six weeks.”

Corporate VP of Supply Chain, PHAR1

UK pharmaceutical companies were pressured to hire new staff and ramp up production to meet government targets within the six-month allotted time window without receiving compensation from the UK government.

Customer pressure typically manifested itself as demands to maintain supply continuity. This often was expressed as customers asking organizations to relocate production, increase capacity, or other requests to ensure material and final product availability during the disruption. Customer pressures featured prominently in the Heavy Engineering industry, where the sector's largest customer is the UK government. Heavy Engineering firms explained how pressure from government agencies to build excess inventory in the event of a no-deal Brexit added additional production, labor, and storage costs to their business. The Engineering Director at HE2B, responsible for manufacturing rail cars and components, explained how the UK government had routinely pressured his industry to increase stock levels during the Brexit negotiations:

“Yes, pressure is being exerted mainly from the UK government because they have said we need to have the controls in place to prevent any impact; otherwise, it could be a reputational disaster. Early on, we were asked to increase all stock by 3 months, some stock we hold has a 24-month lead time, and some we have never had to buy in 20 years, so it became an impossibility”.

The Engineering Director, HE2B

The increased tariffs imposed by the US and Chinese governments also put pressure on firms operating in China. US-headquartered companies attempted to reduce these government pressures by working through trade associations or directly with policymakers. For example, the Board Director at Trade Org1 explained how his company took advantage of free trade zones in the US to circumnavigate new tariffs imposed during the trade war:

“We built foreign trade zones in Oklahoma for pipe importation in just 25 days. This allowed the companies that we work with to get around the 232 tariffs...once we get the release waiver, these companies are going to move the pipe out of the trade zone and put it on the open market, which means they don't have to pay the full tariff” – Board Director Trade Org1

Similarly, the Senior Supply Chain Management Specialist at OG3 stated: “We use our foreign trade zones to ship in material, and then use the analytics to help us build a case with the DOC [Department of Commerce] to feed into a legal argument that will defer payment of tariffs.” He explained that tariff deferment improved working capital and allowed his company to continue sourcing key components from China, despite ever-changing government policies. Similarly, companies including CLOTH1 and OG3 worked with import/export councils and the DOC to influence the ever-changing landscape of tariffs on Chinese manufactured goods. The Vice President, Global Manufacturing & Distribution at CLOTH1 explained:

“We use an import/export council to advise us on anything to do with trade. We get them involved on all political risks, whether it’s TPP, NAFTA, China, and have quarterly meetings and a formal monthly report. They have people in DC and are involved in NAFTA and government discussions, and up to the minute decisions made by Trump.” Vice President, Global Manufacturing & Distribution, CLOTH1

Interviewees explained how the use of foreign trade zones and government lobbying helped to reduce the perceived intensity of government pressure to relocate production to the USA.

#### *4.2 Perceived severity of supply chain disruption risks*

The second key factor influencing supply chain redesign decisions was managerial perceptions of *geopolitical disruption risk*. For example, respondents in the pharmaceutical industry perceived the lack of regulatory alignment between the UK and EU governments due to Brexit as a severe risk. The pro-Brexit vote led to a change in regulatory authority, with new drug approvals and quality standards in the UK switching from the European Medicines Agency (EMA) to the Medicines and Healthcare products and Regulatory Authority (MHRA). This regulatory change forced pharma companies to duplicate quality control and release facilities in the UK and Europe. The Executive Operations Director at PHAR3 explained how her company faced severe disruption risks due to anticipated border delays following Brexit, which informed her decision to invest in new facilities on the European mainland: “We have built a new laboratory facility in Spain and completely replicated all of our quality control (QC)

testing equipment – we hired new analysts for QC cross-validating the tests.” Her rationale was that changes to regulatory oversight and the high risk of border delays necessitated setting up new quality control facilities in Europe.

Heavy Engineering companies perceived currency volatility as a severe risk since they sell products in pounds sterling but purchase supplies in euros. Over the four-year Brexit period, the UK sterling devalued by 10% against the euro, leading to high costs for heavy engineering firms, as explained by the Head of Engineering and Compliance at HE1:

“We will continue to monitor the costs of our imports required at our maintenance depot. This is vital for the continuation of long-term collaborative relationship with our key customers...despite any short-term currency fluctuations that we might encounter due to Brexit.”

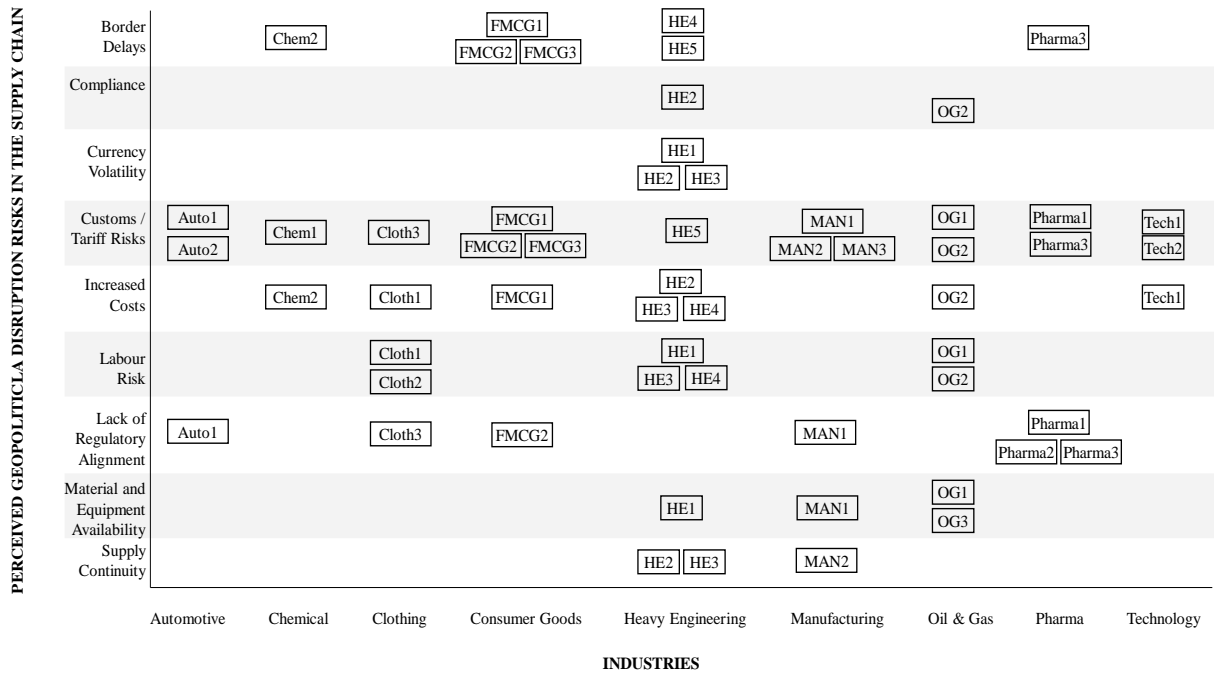
Head of Engineering and Compliance, HE1

The Solutions Director (EMEA) at HE5 described the trajectory of his supply chain, with components that originated in China were shipped to Italy for final assembly and then transported to the UK for sale. He explained how this long and complex supply chain created multiple points of failure, which became evident as Covid-19 spread from China to Italy in January of 2020:

“All trucks (coming) from (our factory in) China have been delayed. Currently, this delay is up to 40 days... Also, we have key components (e.g., all our plastics) that come from China that would have an impact on our supply chains. Right now, we have a factory in northern Italy which is still producing despite the lockdown due to Coronavirus. So, everyone who is not working on the production line has been asked to work from home. For now, all of our focus is on keeping that factory running.”

Solutions Director (EMEA), HE5

Figure 6 summarizes the categories of disruption risks identified during the coding process. Respondents in all industries discussed how they perceived risks related to increased customs duties and tariffs due to Brexit and the US-China trade war. Interviewees in the Apparel, Heavy Engineering, and Oil & Gas sectors discussed their heightened perceptions of border closures and labor risks related to Covid-19.



**Figure 6: Perceived geopolitical disruption risks in the supply chain**

In many instances, managerial perceptions about the severity of disruption risk changed from Brexit to the US-China trade war and then to Covid-19. Some respondents felt that supply chain risks presented an ongoing and severe threat of disruption. In contrast, others viewed these risks as just another operational challenge that needed to be managed, as explained by the Head of Supply Chain at OG2:

“The discussion within the industry is all about getting on with it... we all have a business to run so we need to focus on what the implications are and what are the deadlines so that we can get ready to get the compliance action right. Brexit is a major change in which we think about our operations, but with adequate preparation and hyper care we can see it through without considering it as a very significant risk”  
 Head of Supply Chain, OG2

While this manager competed in the same institutional environment as our other interviewees, he perceived disruption risks as less severe because his team had proactively established contingency plans for the potential outcomes of Brexit. The Director of Logistics Procurement and Strategy at MAN3 explained how his company simulated a range of scenarios during the Brexit negotiations including a worst-case no-deal outcome where trade reverted to WTO

terms, and a best-case outcome with the UK remaining in the EU single market and customs union:

“In both potential Brexit scenarios, we have worked on risk mitigation considering how long delays might last, where we should put our materials, how would we move them, and where the political outcomes will leave us. We haven’t relied on the government to “look after our interests” but have taken a position that is neutral to whatever outcome occurs.”

Director, Logistics Procurement & Strategy, MAN3

This quote highlights that perception of the severity of disruption risk changes over time as managers build contingencies and take proactive action to mitigate those risks.

#### *4.3 Ease of Moving Suppliers and Supply Chain Assets*

The third factor that influenced managerial decision-making when redesigning supply chains was the relative ease of moving suppliers and supply chain assets. The data suggests that companies in some sectors, such as technology/electronics (TECH1, TECH3), could move facilities with relative ease, while other sectors, such as automotive (AUTO1, AUTO2, AUTO3), were not. For example, Senior Executives in the technology sector explained that it was relatively straightforward to nearshore production facilities as their industry had limited regulatory oversight and a high number of suppliers. They responded to new tariffs introduced during the US-China trade war by relocating production to Vietnam and Mexico, which allowed them to avoid newly imposed tariffs while maintaining close access to the lucrative Chinese and US markets. The Senior Advisor at TECH3 (an electronics contract manufacturer) explained his rationale was to nearshore production by moving production facilities out of China while keeping labor costs as low as possible:

“I want to be a fast follower, and so I remained open to moving factories anywhere in the world. We have the capability to do rapid scale-up in our HQ and move the production process to any location in the world that has the lowest cost. Vietnam is already on a clear path to being low-cost, and so is Mexico, and so I believe there will be a Pan-American sourcing platform ahead. We need to remain flexible to different supply chain designs based on the new outcomes in a post-global, post-Covid world.”

Senior Advisor, TECH3

We found that several companies were already moving facilities back to their home market due to Brexit and the US-China trade war, and COVID-19 acted as an accelerant of the localization trend. Respondents that were reshoring production explained how they could re-locate manufacturing with relative ease. The Corporate VP at PHAR1 explained:

“Historically, we have recognized that the US is an extremely important pharmaceutical market. ...with local manufacturing and a local market, and both of those have elements of supporting the global network, but their main purpose is to buy local to sell local”.

Corporate VP,  
PHAR1

However, Executives in the automotive industry explained the difficulty they had moving facilities due to suppliers being clustered in one geographical area. The Senior Vice President of Merchandising and Operation Support at AUTO3 explained:

“The supply chain moved 30 years ago to China. There are only three brake rotor manufacturers in the world, all in one Chinese province, and they produce 80% of the world’s demand. It would take too long and be too expensive to move to another part of the world.” Senior Vice President of Merchandising and Operation Support, AUTO3

He explained how tariffs on aluminum and steel had impacted his margins but were not significant enough to justify the costs of relocating production to another part of the world:

“The capital to remove a product from China is enormous; that ship has sailed. If you change to a supplier in another part of the world, it will require more than a 25% tariff to make it worthwhile.” His rationale was to avoid trying to switch suppliers out of China and instead pass price increases from new tariffs on to his customers. These examples illustrate how supplier clustering in particular geographic regions and high sunk costs in existing facilities can render global supply chain redesign extremely difficult. Companies with immobile supply chain assets have had to maintain an off-shore supply chain design even during significant geopolitical upheaval. These findings are next interpreted using the institutional logics perspective to arrive at a series of novel propositions.

## 5. Discussion

The institutional logics perspective (Thornton et al., 2012) suggests that logics emerge when institutions exert pressures on organizations, who then respond by altering their structures to mitigate uncertainty and achieve legitimacy with stakeholders (Friedland & Alford, 1991; Meyer & Rowan, 1977; Thornton, 2004). Our findings provide broad support for the notion that institutional pressures influence the decision-making rationale of Senior Executives in situations of high uncertainty. However, we found that when these individuals experience the same institutional pressures, such as government and regulatory pressures during Brexit, they often make different decisions in terms of supply chain design. For example, pharmaceutical firms relocated their distribution hubs and quality control facilities from the UK to Europe due to the regulatory divergence between the UK and EU governments. At the same time, heavy engineering companies kept suppliers overseas and built up stock to ensure compliance with government mandates. This suggests that institutional pressures do not act as an isolated force influencing managerial decision-making. Instead, our findings indicate that institutional pressures, combined with perceived disruption risk and the ease of relocating supply chain assets, influence decision-making logic. This finding supports the assertion of Charpin et al (2020) that variations in political risk perceptions create different political legitimacy goals for firms. We build on Charpin et al. (2020) by arguing that managerial decision-making is influenced by more than political risk perceptions; what is essential is the interrelationship between risk perceptions, institutional pressures, and the mobility of supply chain assets.

Further, the institutional logics perspective assumes that if the market and industry pressures are consistently applied, the desire for social legitimacy will often cause organizations to shift their structures, processes, and strategies (Besharov & Smith, 2014; Greenwood et al., 2010; Thornton & Ocasio, 1999). In contrast, even if an Executive wanted to change their supply chain structures, they were not always able to exercise this option due



to scarce and entrenched suppliers and high sunk costs in existing facilities. Take, for example, AUTO3, who explained that tariffs on steel and aluminum would need to be significantly higher than 25% to justify switching from a brake rotor supplier in Northern China to a domestic source. This suggests that an entrenched supply base, coupled with high sunk costs in existing facilities, informs a rationale for carrying on business despite persistent institutional pressures and disruption risks. This finding differs from Belhadi et al. (2021), who found that the automobile industry perceived that the best strategy to mitigate Covid-19 related risks was to develop localized supply sources. Instead, our findings show how automotive companies maintained their offshored supply chain design because supplier relocation was cost-prohibitive. Taken together, these findings inform the following proposition:

**P1:** During periods of significant geopolitical disruption, the decision-making logic of managers is influenced by the perceived intensity of institutional pressures, the ease of moving suppliers and supply chain assets, and the perceived severity of supply chain disruption risk.

Early contributors to institutional theory argued that organizations tend to manage high levels of uncertainty by mimicking the organizational structures of leaders in their field (DiMaggio & Powell, 1983). We found some support for replicating supply chain design by companies in the same industry, such as TECH2 and TECH3, who nearshored production to Mexico and Vietnam during the US-China trade war. Similarly, PHAR1 and PHAR3 moved production facilities from overseas and localized production in the UK and the USA. However, our interviewees explained that the rationale behind nearshoring and onshoring was not to mimic a more successful industry leader, as suggested by DiMaggio and Powell (1983). Instead, these Executives were responding to intense government pressure and persistent geopolitical risk, be it in the form of tariffs for technology companies or government mandates for pharmaceutical companies to re-shore the production of critical drugs during the pandemic. This observation suggests the following:

**Proposition 2:** During periods of significant geopolitical disruption, intense government pressures and persistent supply chain disruption risk will influence decision-makers to adopt similar supply chain design approaches of companies within the same industry.

Later contributions to institutional theory place less emphasis on isomorphism between organizations and instead stress the importance of differentiated institutional logics on individuals and organizations (Friedland & Alford, 1991; Scott, 1995; Thornton & Ocasio, 1999). Our cross-industry analysis shows patterned responses within some industries and a wide divergence of decision-making logics in other industries. For example, managers in the Oil and Gas, Manufacturing, and Clothing industries adopted a near-shore or on-shore supply chain design. In contrast, companies in the automotive industry had to ‘Grin and Bear It’ due to entrenched suppliers, leading to the maintenance of an off-shore design. These findings suggest that companies competing in the same highly uncertain institutional environment experience institutional pressures differently and perceive the severity of disruption risks to different degrees. Our findings indicate that a dominant supply chain design logic in a particular industry is not shared perceptions of pressures or risks between companies but the mobility of the supply base and supply chain assets. These observations lead us to propose the following:

**Proposition 3:** Dominant decision-making logics do not emerge in a particular industry because of intense institutional pressures or persistent supply chain disruption risks, rather they emerge in response to an entrenched supply base and supply chain assets.

Our findings suggest that managers developed and deployed a variety of decision-making logics because the institutional environments in which they competed constantly evolved and changed. Our examination of compounding supply chain disruptions supports the argument of Blessley & Mudambi (2022) that by making adaptations for one geopolitical disruption, the supply chain becomes more prepared for the next disruption that is sure to follow. During interviews in the early stages of the Covid-19 pandemic, executives explained how they wanted to make significant and immediate supply chain redesign decisions, such as localizing all production in home markets. As time passed, we found a reduced sense of

urgency to completely overhaul supply chain designs and an emerging rationale for shorter-term tactical changes such as switching production volumes and having backup suppliers. Only industries that provided critical goods, such as pharmaceuticals, under intense political pressure, pushed ahead with a localization agenda. As managers developed contingencies, their perceptions of the severity of supply chain disruption risks subsided. For example, FMCG1 and FMCG2, which operate just-in-time supply chains, had planned to localize production shortly after the Brexit referendum. However, as time passed, these managers realized the difficulty of moving facilities and transitioned to building redundancies to deal with any possible outcome of the Brexit negotiations. This finding supports Alikhani et al. (2021), who argue that building buffers at each node of the supply chain and inventory swapping create resilience. Other companies in our study chose not to redesign their supply chain but instead to use technology to enhance supply chain visibility. This finding supports Quieroz et al. (2022) and Nikokoor and Yanadori (2022), who stress the importance of digital connectivity and supply chain visibility in building a resilience strategy during the pandemic. These findings inform the following proposition:

**Proposition 4:** Managerial decision-making is influenced by multiple logics at any given time, which are likely to change over time in response to variation in institutional environments and perceptions of geopolitical disruption risks.

## **6. Managerial Framework: Supply Chain Logics and Supply Chain Design**

These findings were synthesized to develop a novel construct we define as ‘supply chain logics’. Our analysis suggests that during periods of significant and compounding geopolitical disruptions, the logic that informs supply chain design decisions is influenced by the perceived intensity of institutional pressures, the ease of moving suppliers and supply chain assets, and the perceived severity of supply chain disruption risk. Based on these findings, we advance the following definition of supply chain logics:

*Supply Chain Logics represent a constrained system of reasoning that supply chain executives employ to navigate uncertain global operating environments. They are shaped by variable levels of institutional pressures, the perceived severity of supply chain disruption risk, and the mobility of suppliers and supply chain assets.*

Eight predominant forms of supply chain logics emerged from the data analysis. We applied our terminology to these logics as a means of describing their intent: 1) Navigate the Policy Environment, 2) Maintain Market Access and Supply Continuity, 3) Close to the Customer, 4) Almost Home, 5) Tactical Warfare, 6) Keep it Simple, 7) Grin and Bear it, and 8) Ready for Every Scenario.

***Navigate the Policy Environment*** - Evident in environments characterized by limited institutional pressures, supply chain disruption risks, and relative ease of moving manufacturing facilities and finding new suppliers. Executives following this logic attempted to influence policymakers first, working through trade associations or directly with government lobbyists to influence the future course of trade negotiations, before altering their supply chain designs. For example, Executives in the pharmaceutical and heavy engineering sectors lobbied UK policymakers to remain in the European customs union as doing so would maintain the smooth flow of components and finished goods between the UK and EU. Only after attempts to influence the course of future trade arrangements failed did these Executives look to redesign their supply chains.

***Maintain Market Access and Supply Continuity*** - Senior Executives following this supply chain logic experienced a high level of institutional pressures, but perceived supply chain disruption risks to be low and found it relatively easy to move facilities and switch suppliers. Institutional pressures emanated from governments, regulators, suppliers, and customers. Senior Executives adopting this logic prioritized market access and supply continuity in anticipation of a no-deal Brexit, border closures due to Covid-19, or prohibitive tariffs on Chinese goods. The logic here was to ensure the smooth flow of materials and

finished goods, which resulted in production, distribution, and quality control facilities being relocated from the UK to the EU or from China to Vietnam and Mexico.

*Close to the Customer* - Senior Executives following this logic explained how they experienced intense government pressures and heightened and continuous supply chain disruption risks. These Executives tended to be in industries with significant government oversight, such as pharmaceuticals, which provided critically important products to treat the symptoms of Covid-19 (PHAR1, PHAR 3). The UK and US governments applied pressure on these companies using policy tools such as the Defense Production Act, which limits exports to encourage the re-shoring of production facilities. The Corporate VP at PHAR1 explained: “We see a trend in the industry towards localization of production; many governments are putting policies forward, making it very restrictive to operate without some local manufacturing.” Senior Executives adopting this logic perceived significant risks from operating long, complex supply chains and felt an urgency to onshore production due to intense government pressure.

*Almost Home* - Senior Executives following this logic perceived limited institutional pressures and found it relatively easy to move manufacturing facilities. However, many expressed the looming severity of supply chain disruption risks. This logic was particularly prevalent in the Technology (TECH2, TECH3) sector, where interviewees shared how they were actively moving production out of China. The rationale was to redesign supply chains so production and supply were close to significant sources of demand, which would reduce the probability of disruptions risks that may arise from the port and border closures. By shortening the supply chain and bringing supply closer to major demand centers, these Executives reasoned that there would be fewer potential failure points in the supply chain.

*Tactical Warfare* - Senior Executives following this logic competed in environments of low institutional pressure and low perceived disruption risk. They expressed difficulties

relocating facilities and developing new suppliers due to the high sunk costs in existing facilities and the limited raw material and component suppliers. The resulting logic was to adopt short- to medium-term tactical approaches, which often involved building and shifting inventory buffers between existing facilities. This logic was prevalent in the Chemical industry, where the Marketing Head for the UK and Ireland (CHEM1) explained his tactic of accumulating inventory: “We wanted to make sure that we were up to 80%-90% of the contingent stock the week before a hard Brexit so that we were ready... The Brexit holding stock cost us around £500k in extra warehousing alone last year”. Due to high sunk costs, he reasoned it would be easier to build inventory at his Ireland facility than set up a new UK facility.

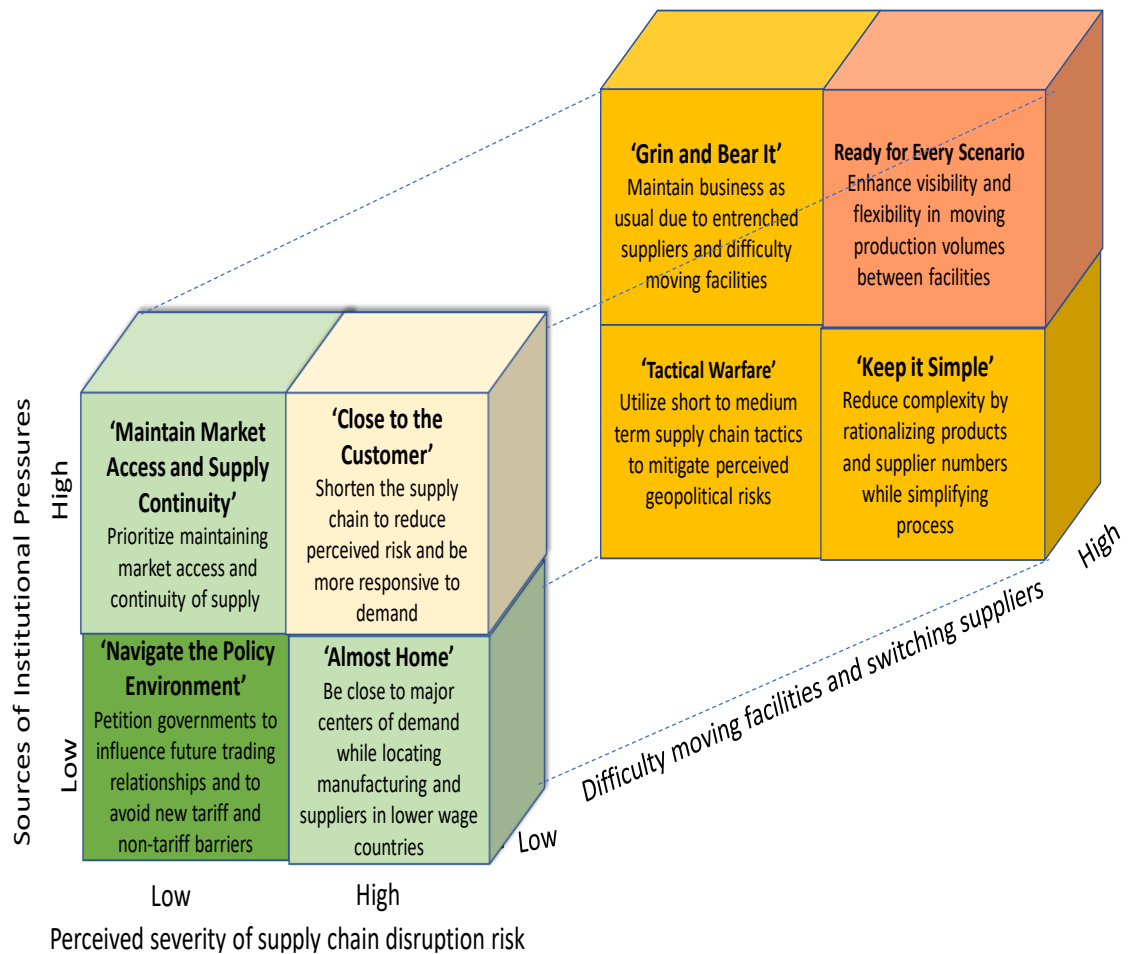
***Keep it Simple*** - Senior Executives following this logic described high levels of supply chain complexity, particularly in terms of increased product variety and many geographically dispersed suppliers, which created unnecessary sources of disruption risk. They also explained that moving production was challenging due to high sunk costs in existing facilities. These individuals prioritized reducing complexity using short-term tactics such as rationalizing suppliers, reducing product lines, and lowering the number of stock-keeping units. By reducing supply chain complexity, these Executives explained how perceived disruption risk lessened, and the urgency to redesign supply chains also reduced in response.

***Grin and Bear It*** - Senior Executives following this logic were under pressure from many sources, including customers, competitors, suppliers, and particularly governments, who were imposing new tariffs on trade. Despite these pressures, companies carried on business as usual due to suppliers clustered in one fixed location and high sunk costs. This supply chain logic was particularly prevalent in the Automotive sector, where brake rotor manufacturers were clustered in one geographical area. Decision-makers following this logic reasoned it was

more cost-effective to maintain an offshored supply chain than relocate production using a nearshored or on-shored design.

*Ready for Every Scenario* – Senior Executives following this logic faced intense institutional pressures, significant geopolitical disruption risk, and extreme difficulties moving production facilities or developing new sources of supply. Due to the severity of these three factors, Senior Executives prioritized flexibility throughout the supply chain, using tactical approaches such as switching production volumes between manufacturing facilities. During the initial waves of COVID-19, these decision-makers prioritized supply network mapping exercises to isolate single points of failure and established backup suppliers so production volumes could be quickly moved. These Senior Executives relied heavily on digital tools, including digital twin simulations or end-to-end enterprise resource planning software that provided scenario planning and visibility of work-in-progress and finished goods inventory throughout the supply chain. As explained by the Vice President, Procurement at TECH2: “We will become more reliant on digital capabilities for decisions. The procurement operating model is shifting, not so much toward traditional outsourcing but instead toward more flexible digitally-enabled models”.

These eight supply chain logics are now mapped onto a 2x2x2 matrix (Figure 7), where the x-axis shows the perceived **S**everity of Geopolitical Disruption **R**isks (SR: Low to High). The y-axis represents the perceived intensity of Institutional Pressures (IP: Low to High). The z-axis measures the perceived difficulty of **M**oving **F**acilities and **S**witching suppliers (MFS: Low to High).

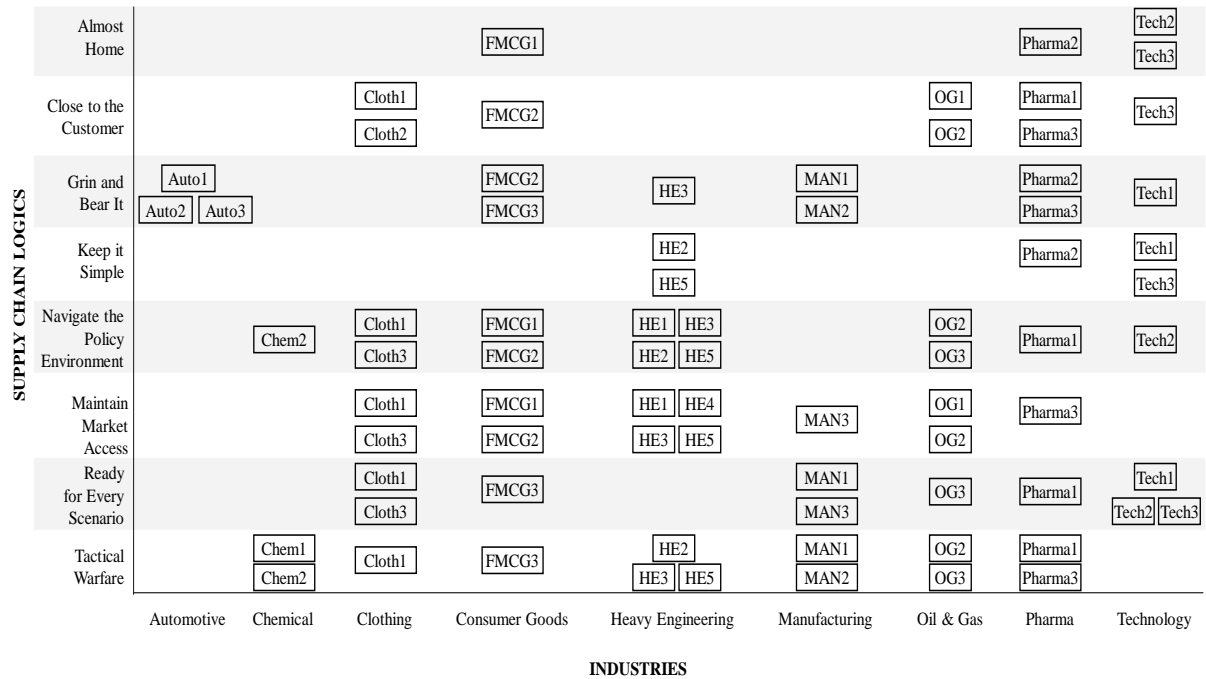


**Figure 7: Supply chain logics identified during Brexit, the US-China trade war, and Covid-19**

We found that in some industries, a dominant supply chain logic emerged (AUTO, CHEM), while in other industries, decision-makers exhibited a much broader range of logics. For example, Executives in the Chemical industry (CHEM1, CHEM2) revealed a dominant 'Tactical Warfare' supply chain logic due to strict regulatory regimes that made moving facilities expensive and complex; these firms had no other choice but to adopt tactical approaches such as building buffer stocks. Executives in the Heavy Engineering sector followed a primary and secondary logic; they began by Navigating the Policy Environment and then turned to a maintaining market access logic. As the UK government is their primary customer, Heavy Engineering firms could not push their policy agenda too far, or they risked

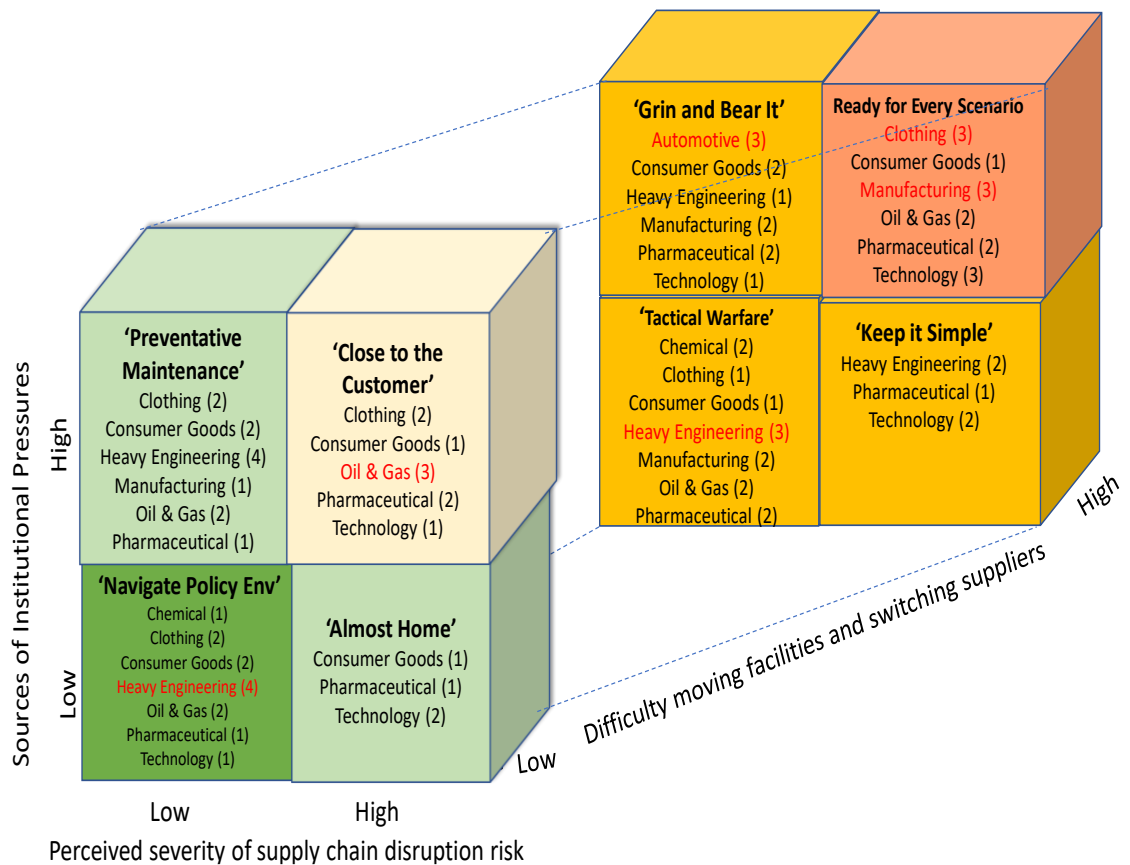


losing business. After two years of unsuccessfully lobbying policymakers, these companies began making strategic investments in UK-based suppliers to maintain supply continuity in a no-deal Brexit. Figure 9 provides an overview of the range of supply chain logics identified at each company in our study.



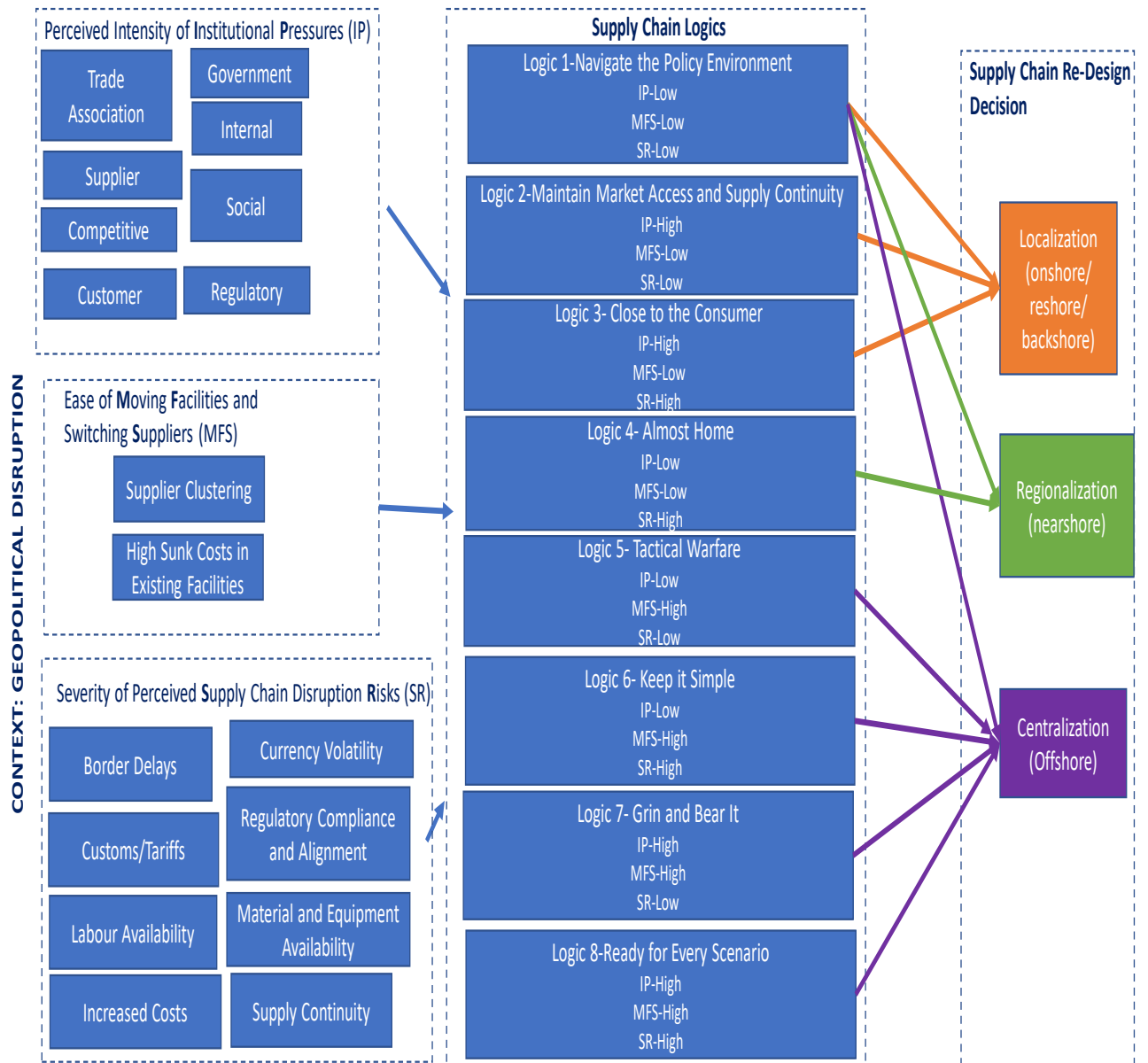
**Figure 8: Supply Chain Logics- Cross-Company and Cross-Industry Comparison**

The industry-level comparison in Figure 8 is mapped onto our decision-making framework of supply chain logics. This 2x2x2 matrix highlights the industry's dominant and secondary supply chain logics (Figure 9). For example, in Figure 9, Automotive (3) denotes that all three AUTO firms exhibited the Grin and Bear it logic. As this is the only logic the AUTO firms demonstrated it is a dominant logic. Figure 9 also shows that some sectors had multiple logics, such as Oil and Gas, where 3 out of 3 companies had a dominant closer to the customer logic. At the same time, 2 out of 3 exhibited a secondary/tertiary maintain market access and navigate the policy environment logic.



**Figure 9: Dominant and secondary supply chain logics by industry**

By identifying and defining these supply chain logics, it is now possible to answer the research question of interest: *Why do managers design supply chains in a specific manner when faced with compounding geopolitical disruptions?* Figure 10 visually depicts how the eight supply chain logics explain why Executives decide to localize, regionalize, or centralize production and supply.



**Figure 10: How supply chain logics inform supply chain design**

Figure 10 shows how the Almost Home logic informs the decision to regionalize supply chains to minimize supply chain disruptions risks while keeping costs low. Similarly, the Maintain Market Access and Supply Continuity and the Close to the Consumer logics inform a localization design. Government pressures to re-shore production are high, and disruption risks are constant – creating a sense of urgency to shorten the supply chain. The Grin and Bear It logic informs the decision to maintain business as usual as it is too costly to relocate suppliers, even in the face of escalating tariffs. Figure 10 also highlights that some supply chain logics,

such as Navigate the Policy Environment, can be linked to localized, regionalized, and centralized supply chain designs. Executives following this logic attempt to influence policymakers in the first instance. When this is unsuccessful, Executives follow a new logic such as Keep it Simple or Ready for Every Scenario. This finding highlights that decision-makers often follow multiple supply chain logics and that these logics change over time as the external operating environment changes.

## **6. Contributions, Limitations, and Future Research Directions**

The novelty of this paper rests on its identification of eight decision-making logics that inform the redesign of supply chains in contexts of significant and compounding geopolitical disruptions (see Figures 8 and 9). Government export restrictions, regulatory interference, and disputes between nation-states often disrupt the flow of goods worldwide. Political leaders call supply chain executives to develop plans to mitigate, avoid, or be prepared for a more significant number of unexpected events. An example is Joe Biden's presidential order to localize the supply of necessary items, including PPE, pharmaceuticals, and semiconductors. The pressure exerted by political leaders, business disruptions, and infrastructural limitations dictates and constrains managers when considering their supply chain design options. We expect that our decision-making framework will help Senior Executives better understand the factors that influence decision-making during periods of extreme uncertainty and the supply chain (re)designs that are likely to result.

Our results and propositions contribute to the institutional logics perspective by extending the concept of logics beyond the organization's boundaries to the supply chain. We find that institutional forces are only one pressure that influences managerial decision-making. Our study proposes that managerial perceptions of risk and the mobility of supply chain assets also influence a manager's decision-making rationale. We find that the decision-making logic of Senior Executives changes and adapts over time, with many nuanced supply chain redesign

decisions within and across industries. Therefore, our study is one of the first to examine *why* managers redesign supply chains in a particular manner when managing compounding geopolitical disruptions.

This study answers the call of Kano and Oh (2020) to provide empirical evidence on how managers in leading firms make decisions under high uncertainty within a network of connected firms. It also answers the call of Craighead et al. (2020) to identify the mainstream supply chain strategies emerging from the extreme turbulence witnessed around the world since the spread of Covid-19. Our findings provide preliminary insights on how perceived pressures, risks, and mobility of supply chain assets influence logically consistent decision-making during supply chain design, paving the way for future theory development.

The findings from this study should be considered in light of its limitations. We used a qualitative research design and a theory-building approach to develop the supply chain logics construct. We sought to extract analytical generalizations from our findings by building on existing theoretical foundations. We do not claim that the results are generalizable to broader populations (i.e., statistical generalization) due to the small sample size of companies per industry. We deliberately avoid making claims that our propositions and framework hold for all companies in all industries. Future researchers are encouraged to examine the validity of our propositions by studying more companies in the same and different industries using statistical methods. In the future, researchers may be interested in examining how supply chain designs are changing due to calls by political leaders (Boris Johnson (UK), Joe Biden (USA), Narendra Modi (India)) to re-shore the supply of necessary items. Our propositions could also be examined within the war in Ukraine and ongoing disputes between Russia and the NATO alliance. Geopolitical disruptions and the concept of supply chain logics is a new and emerging field of study that holds significant promise for further theory development in operations and supply chain management.

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### Appendix: Interview Protocol

Theme	Structured Question
Personal History	1. Please provide a brief background about your job role, personal experience in your company and in the industry more broadly?
Supply Chain Risk Management	2. What supply chain related risk factors do you expect to arise from Brexit or the US-China trade war? 3. Do you foresee any potential impact of these risk factors on the manufacturing policy in: a) your sector; and b) your company? 4. Do you foresee any potential impact of these risk factors on the localisation versus regionalisation policy of supply chains in: a) your sector; and b) your company? 5. Which parts of your supply chain are deeply entrenched and hence relatively difficult to relocate and what are the mains risks these entrenched SC parts face from Brexit or the US-China trade war? 6. Which parts of your supply chain are more fluid hence relatively easy to relocate and what are the mains risks these fluid SC parts face from Brexit or the US-China trade war? 7. How has the way your company managed the risks posed by Brexit and the US-China trade war changed over time? 8. What was your understanding of how Covid19 would affect your supply chain when it emerged in December 2019? 9. How has your company’s supply chain approach to dealing with Covid19 differed to what you were initially expecting? 10. What is your company’s strategy to deal with Covid19 in your supply chain moving forward? 11. How would you contrast your company’s supply chain approach to Brexit and the USA-China Trade War versus the approach your company has taken to Covid19?

Theme	Structured Question
Institutional Pressures	<p>12. Do you see any pressure being put on your company to develop plans to deal with Brexit or the US-China trade war? If so where are these pressures coming from?</p> <p>13. Has the competition, or other company's in your industry, developed plans for Brexit or the US-China trade war and has your company adopted any of these?</p> <p>14. Have there been any outside pressures that have influenced how your company has managed the response to Covid19?</p>
Influencing Policy	<p>15. How does your company influence the government on Brexit or US-China trade war related concerns?</p> <p>16. Has your company had any involvement in influencing how the government has responded to Covid19?</p>