Friendshoring: How geopolitical tensions affect foreign sourcing, supply base complexity and sub-tier supplier sharing

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Purpose –This paper examines the influence of geopolitical tensions—operationalized as political divergence between governments—on firms' foreign supply bases and the resulting effects on supply base complexity and sub-tier supplier sharing.

Design/methodology/approach – The authors conduct panel data regression analyses over the period 2003-2019 to investigate whether political divergence affects foreign supply bases for 2,858 US firms sourcing from 99 countries and to examine how political divergence exposure impacts the supply network structures of 853 US firms.

Findings – Firms reduce their supply bases in countries exposed to heightened geopolitical tensions. These supply chain adjustments are associated with increased supply base complexity and greater sub-tier supplier sharing.

Originality– This study highlights the importance of state relations in global supply chain reconfiguration. Political divergence between governments provides a dual-view of political risk (i.e., buyer–supplier countries), which can help firms anticipate geopolitical disruptions. While reducing supply bases in foreign countries facing heightened geopolitical tensions is intended to mitigate disruptions, these supply base adjustments are linked to increased supply base complexity and sub-tier supplier sharing, thereby exposing firms to other types of supply disruptions. Additionally, this research contributes to understanding the effects of geopolitical tensions on supply base complexity through the lenses of transaction cost economics and resource dependence theory.

Keywords: buyer-supplier relationships, geopolitical risk, global sourcing, global operations management, supply chain reconfiguration, supply networks

1. Introduction

Geopolitical tensions increase transaction risks for firms with foreign supply bases (Fan et al., 2022a). These tensions fuel national animosity between states, which can implement discriminatory practices that are a source of supply chain disruptions (Charpin, 2022). For example, China halted exports of rare earth elements to Japan following a crisis between the two countries in 2010 and recently banned the export of key technologies to process the rare earths amid a tense geopolitical climate (Nguyen & Onstad, 2023). Geopolitical disruptions have been exacerbated with crises such as the COVID-19 pandemic and the Russian invasion of Ukraine. They guided political authorities to promote friendshoring or the notion to strengthen economic bonds with politically aligned nations while reducing connections with countries that do not share similar values (Tan, 2022). The aim is to enhance the resilience of global supply chains by diminishing dependence on foreign nations that might exploit them for geopolitical advantages. While government leaders have recently put forth these geostrategic considerations, geopolitical factors have long been recognized as a source of environmental uncertainty affecting firms' responses to disruption risks (Ellis et al., 2011). Accordingly, the purpose of this study is to examine the influence of geopolitical tensions on firms' foreign supply bases and their supply network structures.

Companies adapt their operations and supply chain management (OSCM) design when they anticipate changes in their business environment (Phadnis, 2024). For instance, managers adjust their supply chain strategies related to inventory buffers (Darby et al., 2020), production facility location (Moradlou et al., 2021), and supplier development (Charpin et al., 2021) when they perceive political risk. Firms that have global operations are further exposed to political risk as their cross-border activities can be disrupted by geopolitical tensions (Fan, 2023). These

geopolitical tensions have led to a decrease in bilateral trade and investment (e.g., Evenett, 2019; Fajgelbaum et al., 2020; Whitten et al., 2020), which have contributed to a deglobalization trend (Witt, 2019). We move beyond country trade data analysis to examine the impact of geopolitical tensions on firms at the micro level, allowing us to reveal how these tensions affect supply network reconfiguration and supply risk.

While the OSCM literature has focused on the effects of geopolitical disruptions such as economic sanctions (Shalpegin et al., 2023), the United States (US)-China trade war (Fan et al., 2022b, Jacobs et al., 2022), tariffs (Chae et al., 2019; Cohen & Lee, 2020) or the Russian invasion of Ukraine (Srai et al., 2023) on global supply chain reconfiguration, it has not considered yet the effect of the geopolitical tensions leading to these disruptive events. Geopolitical tensions between states are derived from political divergence or "the extent to which two nations do not share similar interests and values in global affairs" (Charpin et al., 2024, p. 2). Not only political divergence is highly aligned with the concept of friendshoring, but it has also been shown to affect cross-border activities such as mergers and acquisitions (Yoon et al., 2021), patenting activities (Zhou et al., 2023) and research collaborations (Charpin et al., 2024).

With respect to global sourcing, political divergence can generate supply disruptions and thus impact a firm's decisions related to foreign supply base locations. On the one hand, the buyer can be impacted by an intervention of its own government targeting the supplier's country and firms. For example, in 2020, the US government imposed a 25% tariff on a variety of French goods in retaliation for a digital tax imposed on US internet companies (Palmer, 2020). On the other hand, the buyer can be impacted by an intervention of the supplier's government targeting its own government and firms. For instance, in 2019, Japan hit South Korea with export controls on semiconductor manufacturing materials following a feud over World War II compensations

(Matsuoka, 2019). In both cases, the buyer is exposed to either additional transaction costs or supply disruptions, which should incentivize the firm to adapt its global sourcing strategy to mitigate the risk. Furthermore, the supply chain adjustments intended to address geopolitical tensions, may have repercussions on the firm's supply network structure in terms of complexity and sub-tier supplier sharing, two potential sources of disruption. To investigate these critical issues, we seek to answer the following research questions: *Does political divergence between states affect firms' foreign supply bases? Do firms' exposure to political divergence influence their supply network structures?*

To answer these questions, we leverage transaction cost economics (TCE) and resource dependence theory (RDT) and create a panel dataset of US firms over the period 2003-2019 by combining data from multiple sources. We rely on the FactSet Revere Supply Chain Relationships database for supply chain variables, the United Nations General Assembly Voting dataset for political divergence, as well as the Gravity database and Compustat for country and firm control variables respectively. We use linear regressions to assess the effect of political divergence on foreign supply bases for 2,858 US firms sourcing from 99 countries. We find that companies reduce their supply bases in countries where political divergence increases. We also use linear regressions to study the influence of political divergence exposure on the supply network structures of 853 US firms. We find that a firm's exposure to political divergence increases its supply base complexity and tier-2 supplier sharing.

This research makes several contributions to the OSCM literature. First, our results contribute to the literature on political risk and global supply chain reconfiguration. We introduce political divergence between countries as a source of geopolitical tensions that influences firms' global sourcing strategies and supply network structures. We depart from the OSCM literature that

focuses on a single-country perspective as a source of political risk (e.g., Brexit) and the studies examining the effects of policy shocks associated with geopolitical disruptions (e.g., US-China trade war). This study highlights the role of dynamic political relations, a root cause of these geopolitical disruptions, in global supply chain reconfiguration. Second, we contribute to the supply network literature by providing theoretical and empirical insights into the impact of geopolitical tensions on supply base complexity. While TCE advocates for reducing supply base complexity to mitigate transaction costs and risks in the event of geopolitical disruptions, RDT posits that increasing supply base complexity can decrease exposure to such disruptions. We find that firms increase both their horizontal and spatial complexity, suggesting that RDT might be more suitable for explaining how firms react to geopolitical tensions by buffering their supply base. Third, we contribute to the supply chain risk management literature by showing that geopolitical tensions exposure can lead to an increase in tier-2 supplier sharing, which is a source of financial (Wang et al., 2021) and disruption (Ang et al., 2017) risks.

Our findings also have important implications for practitioners. State relations are dynamic, and their status is highly dependent on their political alignment in global affairs. Political divergence is a source of geopolitical tensions and conflicts between states, which can result in the implementation of discriminatory policies that disrupt supply chains. Sourcing managers should keep monitoring the influence that geopolitical tensions could have on their key supplies and adjust their global sourcing practices consequently. However, practitioners should be cautious when making such adjustments, as increasing supply base complexity to mitigate geopolitical disruptions can lead to the propagation of other types of disruptions within the supply network, potentially affecting supply chain resilience.

2. Literature review

2.1. Deglobalization amid geopolitical tensions

The 2008 global financial crisis led to a decline in average levels of foreign direct investments and imports worldwide (Witt, 2019). This trend was fueled by a wave of protectionism with a multiplicity of discriminatory practices against foreign commercial interests (Evenett, 2019). Many policymakers became increasingly worried about a globalization phenomenon that had gone too far and generated dependencies on foreign nations in a context of geopolitical tensions (Evenett, 2020). The economics literature has examined the impact of political relations between states on trade patterns. While similarity in policy orientations (Dixon & Moon, 1993) and government visit officials (Lavallée & Lochard, 2022) contribute to increase exports, political conflicts reduce trade through consumer boycotts (Heilmann, 2016) and geopolitical tensions negatively impact trade (e.g., Gupta et al., 2019; Whitten et al., 2020). Several studies have focused on the negative repercussions of these geopolitical tensions, with a particular emphasis on the US-China trade war. They found that US tariffs were passed on US importers and consumers (Amiti et al., 2019) and contributed to reduce export growth (Handley et al., 2020), imports (Fajgelbaum et al., 2020), and aggregate real income in the US and China (Fajgelbaum & Khandelwal, 2021).

These studies at the country level provide important insights on the impact of geopolitical tensions and trade restrictions on key macroeconomic indicators. However, they do not address how geopolitical rivalry affects firms and their strategies. Accordingly, economics and strategy research streams have investigated these issues at the firm level to better understand how geopolitical tensions impact firms' value and their strategic responses to political risk. Geopolitical rivalry decreases market value for firms with strong economic ties to the countries involved in the conflict as demonstrated by political frictions between China and Japan (Fisman et al., 2014) and

the US and China (Huang et al., 2023). Anticipating the negative effects of geopolitical conflicts, firms were found to reduce their investment and R&D expenses during the US-China trade war (Benguria et al., 2022) and to divest their assets in Russia following the invasion of Ukraine (Evenett & Pisani, 2023). Political tensions between states have also influenced several international strategic decisions such as cross-border acquisitions (Arikan et al., 2020), ownership choices (Yoon et al., 2021), and patenting activities (Zhou et al., 2023) in host countries.

In sum, geopolitical tensions, often associated with protectionist measures, have reduced bilateral trade and negatively affected firms engaged in cross-border activities. We now turn our attention to the examination of geopolitical disruptions in the OSCM literature.

2.2. Geopolitical disruptions and supply chain reconfiguration

Geopolitical disruptions resulting from conflicts among nation-states affect the configuration, flows, and management of global supply chains (Bednarski et al., 2023). Countries feud over political, economic, territorial, or social issues, which trigger national animosity and the implementation of discriminatory practices toward global supply chain activities (Charpin, 2022). Contemporaneous geopolitical events that have disrupted global supply chains include the Brexit, protectionism related to the COVID-19 pandemic, the US-China trade war, and the Russo-Ukrainian war (Bednarski et al., 2023). These events lead managers to redesign their global supply chains based on their perceptions of institutional pressures and risk severity, and the mobility of their supply chain assets (Roscoe et al., 2022).

This research stream has paid a specific attention to Brexit and the ramifications of the United Kingdom's departure from the European Union on companies' supply chain strategies. Hendry et al. (2019) found that supply chain actors collaborate to adapt their business models and

influence the constitutional change in order to build supply chain resilience. Contingent on their size and the time-horizon, firms deploy intangible and tangible resources to respectively decrease the perceived uncertainty and mitigate the impact associated with the geopolitical disruption (Roscoe et al., 2020). Moradlou et al. (2021) found that market and efficiency-seeking advantages drove firms' manufacturing location decisions during Brexit. Focusing on a different disruption, Srai et al. (2023) examined how firms unhooked their supply chain assets from Russia following the invasion of Ukraine by using a mixed of continuity, resiliency, and strategy-focused practices to respectively address short-, mid-, and long-term reconfiguration challenges.

The OSCM literature investigating the impact of geopolitical forces on global supply chain redesign has been mainly conceptual (e.g., Bednarski et al., 2023; Charpin, 2022; Handfield et al., 2020) and qualitative (e.g., Roscoe et al., 2020; Srai et al., 2023). Empirical quantitative studies on the subject were scarce but have become more prevalent. A couple of studies have examined the impact of the US-China trade war on firms' financial performance. Fan et al. (2022b) found that the US-China trade war worsened the profitability and inventory performance of firms with direct supply ties in China, while Jacobs et al. (2022) found that the US government ban on the Chinese telecommunication firm ZTE negatively affected the returns of ZTE's US suppliers. In a subsequent study on the US-China trade war, Fan et al. (2024) found that the conflict reduced buyer-supplier transaction value. The authors also observed that Chinese suppliers with superior innovative and social responsibility capabilities, as well as fewer political ties, were less affected by this drop. Additionally, certain studies started investigating the links between protectionism and supply base complexity. Chakkol et al. (2023) examined 30 US firms, which were found to reduce their spatial complexity during Trumps' presidency. Fan et al. (2022b) found that horizontal and spatial complexity further deteriorated the financial performance of firms exposed to the US-China

trade war, while Chae et al. (2019) developed a conceptual model to examine the effect of tariff increases on supply base complexity.

A commonality among the OSCM research on geopolitical disruptions is their focus on specific geopolitical events such as Brexit or the US-China trade war. We also note that Brexit studies focus on UK firms and a constitutional change driven by a domestic nationalistic surge rather than a clash between two states. The general dynamic of geopolitical tensions between states and over time has been widely disregarded in supply chain management. An exception is Charpin et al. (2024) who found that geopolitical tensions decrease international research collaborations, a key pathway to access knowledge resources in global operations. Yet, the impact of geopolitical tensions on global supply chain management has not been addressed in a quantitative longitudinal study. We thus seize the opportunity given that geopolitical tensions were found to impact trade patterns and many firm strategic decisions as described in Section 2.1.

Our study aims to address this gap by examining the influence of geopolitical tensions on global sourcing practices and their impact on supply network structures. Our work differs from the aforementioned OSCM research streams in the following ways. First, we focus on bilateral political tensions between the buyer and supplier countries and thus depart from the studies that examine risk as emanating from either the buyer or supplier country (e.g., Brexit). Second, we examine geopolitical tensions occurring over a significant period (2003-2019) rather than focusing on a single geopolitical event (e.g., Russo-Ukrainian war). Accordingly, our study intends to capture trends in geopolitical tensions between the US and many countries rather than a specific policy shock between two countries (e.g., US-China trade war). Moreover, we not only consider the effect of political divergence exposure on supply base complexity, but also on the firm's tier-2 supplier sharing, a source of supply risk. Therefore, this research endeavor is an important step

toward improving our theoretical and practical understanding of how firms address geopolitical tensions and the effects of their supply chain adjustments on changes in supply network structure and associated risks.

2.3. Transaction cost economics and resource dependence theory

Recent research has demonstrated the complementarity of TCE and RDT in investigating the effects of political phenomena on firms' international decision-making. Fan et al. (2024) integrated TCE and RDT to shed light on the dynamics of buyer-supplier relationships amid the US-China trade war, while Ertug et al. (2024) invoked both theories to examine the impact of nationalism on cross-border collaborations. In this study, we also rely on TCE and RDT as they provide insightful theoretical bases to investigate how geopolitical tensions affect firms' foreign supply bases and their supply network structures, which we detail in Section 3 – Hypotheses Development. We first review the tenets of both theories and their relevance for global supply chain management in a context of geopolitical tensions.

First, inter-firm relationships in supply chain management can be analyzed through TCE (Grover & Malhotra, 2003; Williamson, 2008), which offers an appropriate theoretical lens to study global sourcing in a context of geopolitical tensions (Fan et al., 2022a). TCE informs the firm's make (hierarchy) or buy (market) decision based on the coordination costs and transactions risks associated with outsourcing the task (Williamson, 2008). Decision-makers' "bounded rationality and opportunism give rise to transaction costs" (Grover & Malhotra, 2003, p. 460), which are heightened by asset specificity, frequency, and uncertainty related to the transaction. Uncertainty is considered a critical attribute (Williamson, 1979) and includes environmental (external) and behavioral (internal) components that hinder the control and monitoring of the transaction (Grover & Malhotra, 2003). In this study, we focus on environmental uncertainty,

which has been shown to negatively affect offshore outsourcing (Ellram et al., 2008). Geopolitical frictions increase environmental uncertainty by lowering levels of trust (Korovkin & Makarin, 2023) and increasing states' incentives to impose trade restrictions on geopolitical rivals (Evenett & Pisani, 2023). This uncertainty in the context of geopolitical tensions was shown to increase transaction costs for firms involved in cross-border transactions (e.g., Bertrand et al., 2016; Fan et al., 2022b).

Second, supply chain relationships can be examined through the lens of RDT, which posits that organizations are involved in power and dependence dynamics for resources (Pfeffer & Salancik, 2015). Buyers and suppliers are mutually dependent to acquire critical resources that are essential to ensure business continuity and thus their survival. This dependence generates uncertainty for the firm when an external party exerts control over the resources and when only a few alternatives are available (Pfeffer & Salancik, 2015). This asymmetry of power and control can lead firms to implement bridging activities with the exchange partner or buffer internal capabilities to decrease the uncertainty and risk associated with the dependence (Alkhuzaim et al., 2022). In this study, we are interested in supply chain stability, which can be threatened by dependencies to access critical inputs (Bode et al., 2011). Globalization led by the explosion of offshore outsourcing has exacerbated these dependencies, which can be weaponized in times of geopolitical conflicts. Therefore, firms may reconfigure their global supply chains to reduce their exposure to geopolitical rivalry (Witt et al., 2023) because government actions affect the access and allocation of critical resources (Darby et al., 2020).

3. Hypotheses development

We examine the influence of geopolitical tensions on supply chain reconfiguration from two angles as illustrated in Figure 1 and Figure 2. While section 3.1 addresses the effect of political divergence

between two governments on a firm's foreign supply bases (Figure 1), section 3.2 focuses on the effect of a firm's exposure to political divergence on its supply network structure (Figure 2). In section 3.1, political divergence has a dyadic nature as it refers to the political divergence between the firm's government and the government of a *specific* foreign supply base. In section 3.2, political divergence exposure refers to the weighted sum of political divergences between the firm's government and the governments of *all* foreign supply bases.

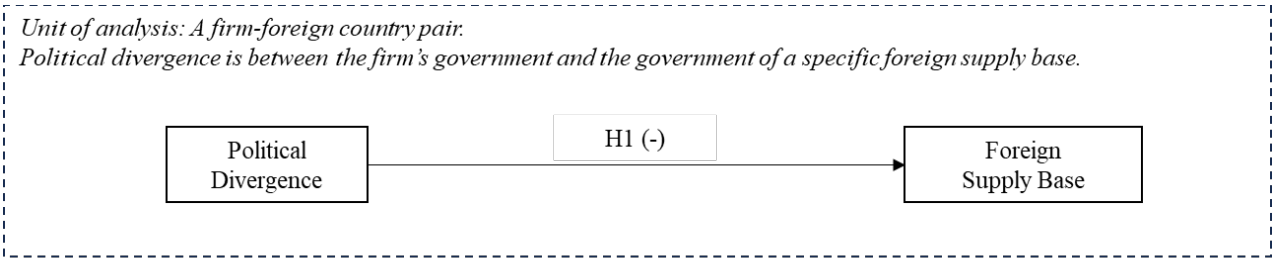

Figure 1. The effect of political divergence on the foreign supply base

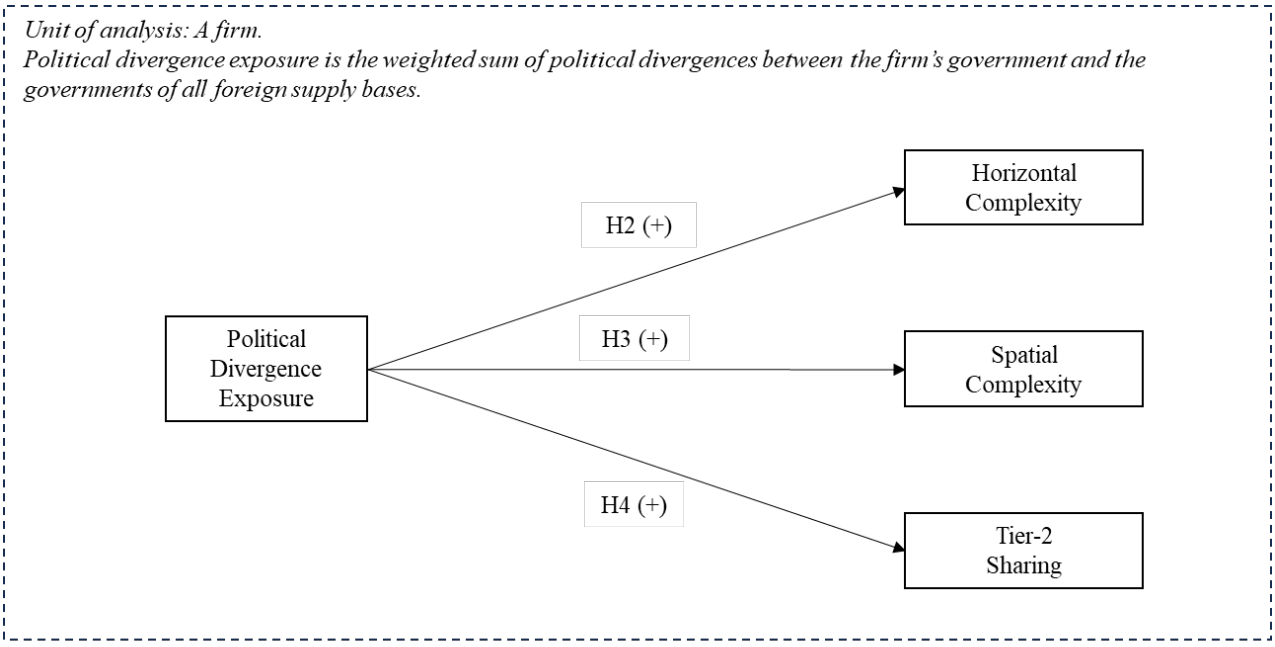

Figure 2. The effect of political divergence exposure on the supply network structure

3.1 Political divergence and foreign supply bases

From a supply chain perspective, buyers shy away from highly unpredictable environments, which expose their supplier relationships to disruptions that could threaten business continuity. For instance, buyers reduce the value of their purchases when they perceive their supply base as being exposed to greater weather risk (Shu & Fan, 2024). Global sourcing magnifies transaction costs as cross-border activities increase environmental uncertainty (Williamson, 2008). A key driver of this uncertainty is related to political factors, which increase the complexity and risk surrounding the buyer-supplier relationship (Fan et al., 2022a). Firms are expected to adjust their supply chain design to respond to political regimen changes that affect supply networks (Phadnis & Jogklekar, 2021). Accordingly, policy uncertainty (Charoenwong et al., 2023) and politician turnover (Dong et al., 2022) were found to be detrimental to sourcing activities. However, global sourcing not only exposes buyers to the political environments of their home country and their suppliers, but also to the bilateral relations between their home government and those of their suppliers.

Tense relations between governments trigger national animosity that can lead to the implementation of discriminatory practices, which are sources of supply chain disruptions and push firms to reorganize their supply chains (Charpin, 2022). As transaction costs increase with the advent of adverse geopolitical events, cross-border transactions become less attractive and buyers may reduce their sourcing activities in countries considered at-risk (Fan et al., 2022a). For instance, a US company decided not to offshore all its outsourced activities to India to mitigate the impact of a potential geopolitical conflict between India and Pakistan (Ellram et al., 2008). A critical source of geopolitical tensions between two countries is their political alignment in global affairs. While political affinity leads to good relations and cooperative behaviors, political divergence is more likely to result in tensions and conflicts among states (Gartzke, 1998).

We argue that firms will tend to avoid foreign countries that exhibit a high degree of political divergence with their home country. Political divergence can lead governments to intervene in buyer-supplier relationships via discriminatory practices that could disrupt the firm's operations and performance. Such practices (e.g., tariffs, export bans) emerged during the US-China trade war and negatively affected US firms' profitability (Fan et al., 2022b) and their stock returns (Jacobs et al., 2022). Transaction costs thus increase for firms that intend to build or maintain cross-border activities in politically divergent countries. To mitigate such transaction risks, firms adapt their practices such as increasing their ownership stake in cross-border acquisitions (Yoon et al., 2021), producing more patents for local innovations (Zhou et al., 2023), and reducing their cross-border R&D alliances (Charpin et al., 2024). Moreover, political divergence can lead governments to weaponize supply chains during a geopolitical conflict (Witt, 2023) as regulations and policies affect resource flows (Darby et al., 2020). Accordingly, firms should reduce their dependency on foreign supply bases that are exposed to geopolitical tensions to avoid government interventions restricting access to critical resources.

Therefore, we posit that firms decrease their supply bases in politically divergent countries to reduce the environmental uncertainty surrounding these buyer-supplier relationships.

Hypothesis 1: Political divergence between a firm's home country and a foreign country is negatively associated with the firm's supply base located in that foreign country.

3.2 Political divergence exposure and supply network structures

After analyzing the global sourcing adjustments associated with geopolitical tensions, we examine their effects on supply network structures. We saw in the previous section that firms exposed to geopolitical tensions may reduce their supply bases in hostile countries to mitigate brewing

disruptions. In this section, we focus on the impacts that these supply chain changes have for the firm's supply network structure with respect to supply base complexity and tier-2 supplier sharing—an important supply risk factor.

There is a great variation in how complexity is defined and operationalized in a supply network (see Ateş and Luzini, 2023 for a review). Complexity broadly refers to the number and variety of entities as well as their interactions within the firm's supply network. Of our particular interest are two structural characteristics that are directly controlled by the buyer—horizontal and spatial complexity (Choi & Hong, 2002)—which are commonly used in OSCM research to investigate supply base complexity issues (e.g., Bode & Wagner, 2015; Lu & Shang, 2017). Similar to Fan et al. (2022b), we define horizontal complexity as the number of tier-1 suppliers and spatial complexity as the number of countries represented in the supply base. These two dimensions of supply base complexity can be affected by antecedents present in the firm's external environment such as political factors (Ateş and Luzini, 2023). We use TCE and RDT to help us understand the influence of political divergence exposure on supply base complexity.

On the one hand, geopolitical tensions increase transaction costs, which are magnified by supply base complexity; hence firms should decrease their supply base complexity under the threat of geopolitical disruptions. Indeed, complexity raises friction in the firm's supply base, which in turn, increases contracting and coordination costs for the focal firm (Choi & Krause, 2006). As horizontal complexity increases, the firm must dedicate more resources to manage a larger supply base. Companies are thereby reluctant to invest in multiple buyer-supplier relationships due to the costs associated with the complexity to coordinate decision-making (Phadnis & Joglekar, 2021). Geographic diversity also increases transaction costs for firms that must spend additional resources to get familiar with new regulatory environments. It is thus more difficult and costly to coordinate

a supply base that is spread across many countries (Dong et al., 2020). When exposed to geopolitical tensions, firms can avoid trade wars by using alternative suppliers in other locations. However, this practice incurs additional contracting and monitoring costs, which exacerbate the negative financial impact of the trade war on the firm (Fan et al., 2022b). Therefore, when facing geopolitical tensions, firms should be incentivized to decrease their supply base complexity to mitigate the increase in transaction costs.

On the other hand, RDT posits that firms depend on external partners to acquire resources that are key to their survival (Pfeffer and Salancik, 2015). From a supply chain perspective, buyers are dependent on suppliers to ensure supply continuity (Alkhuzaim et al., 2022). If geopolitical tensions jeopardized their supply base, firms would be incentivized to search alternative sources and thus increase supply base complexity to mitigate environmental uncertainty. Horizontal complexity provides additional backup options and access to more information to manage a disruption while spatial complexity reduces location dependency. Multi-sourcing across various countries is a recommended buffering strategy to reduce geopolitical risk (Sodhi et al., 2023). According to RDT, the objective of buffering strategies is to reduce the firm's dependence on the supply chain partner (Manhart et al., 2020—the foreign supply base in our case. Firms can source from different locations to avoid the implementation of tariffs (Cohen & Lee, 2020) resulting from an increase in geopolitical tensions. Likewise, Chae et al. (2019) propose that supply base complexity would increase for firms expecting a severe tariff increase.

In sum, exposure to geopolitical tensions may prompt firms to reduce their supply base complexity to mitigate transaction costs. Conversely, it may lead firms to increase their supply base complexity to address disruption risks. Although the effect of political divergence exposure on supply base complexity is ambiguous, we align with RDT and posit that firms increase their

supply base complexity to mitigate geopolitical disruptions. We thus propose the following hypotheses:

Hypothesis 2: A firm's exposure to political divergence is positively associated with its horizontal complexity.

Hypothesis 3: A firm's exposure to political divergence is positively associated with its spatial complexity.

Another important consideration of the firm's exposure to political divergence is the impact of the related global sourcing adjustments on the firm's sub-tier network. Focal firms procure from tier-1 suppliers, which themselves purchase from tier-2 suppliers. When tier-2 suppliers are shared by tier-1 suppliers, supply risk increases for the focal firm because a tier-2 disruption could propagate through the supply base (Ang et al., 2017). Sub-tier supplier financial risk spreads through the network to the focal firm, which is more impacted when its sub-tier network features a high degree of tier-2 sharing (Wang et al., 2021). Accordingly, focal firms prefer a lower degree of tier-2 sharing in their supply base to avoid the negative consequences of a tier-2 supplier disruption (Ang et al., 2017). Our hypothesis 1 posits that firms will decrease their supply bases in hostile countries to mitigate the repercussions of geopolitical tensions. By avoiding certain at-risk countries, the focal firm will not only lose access to their direct suppliers in these countries, but also to the local tier-2 network. First, these tier-1 suppliers are likely to have a sizable number of local tier-2 in their supply base, which will be lost. Second, tier-1 suppliers in other "friendly" locations are also likely to avoid sourcing from hostile countries when geopolitical tensions rise. Moreover, upstream suppliers are highly specialized so there might not be many (competent) alternatives in the supply network.

Therefore, as the focal firm readjusts its tier-1 network by avoiding hostile markets, its direct suppliers will have access to a smaller pool of tier-2 suppliers, which will be shared to a higher extent. Accordingly, we posit that firms exposed to a high degree of political divergence see their tier-2 supplier sharing increase.

Hypothesis 4: A firm's exposure to political divergence is positively associated with the degree of tier-2 supplier sharing among its tier-1 suppliers.

4. Methods

In this section, we present our data, measures, and estimation methods used to test our hypotheses.

4.1 Data sources

We build our sample panel datasets by drawing data from multiple sources. Our starting point is the FactSet Revere Supply Chain Relationships dataset (FactSet), which records business relationships among global companies. FactSet retrieves business relationships through companies' public filings and announcements, press releases and news reports among other sources. FactSet uses information disclosed by both the focal firm and its counterparties to map a comprehensive network of relationships, which has been used to investigate OSCM issues such as sub-tier supply network financial risk (Wang et al., 2021) and supply base complexity (Son et al., 2021). We focus on customer-supplier relationships and more specifically on US publicly traded firms and their supplier relationships over the period 2003-2019. Following the OSCM literature (e.g., Leung & Sun, 2021), we exclude financial firms (SIC codes 6000-6799) from the sample.

For hypothesis 1, our unit of analysis is a firm–foreign country dyad for which we measure the number of relationships between the firm and all its tier-1 suppliers in that particular foreign country during a given year. This sample panel dataset features 152,274 firm–foreign country-year

observations representing 2,858 unique firms and 99 foreign countries. Appendix A details the number of observations per foreign countries. To be included in our sample, a firm must have at least one foreign supplier relationship in the year in question. This criterion ensures that all firms have at least one foreign supplier each year, allowing them to potentially select suppliers in any foreign country. We use the firm's CUSIP identifier in FactSet to retrieve its fundamentals in Compustat.

For hypotheses 2-4, we map the firm's supply network by graphing the relationships between the firm and its tier-1 suppliers, and the relationships between these tier-1 suppliers and their own direct suppliers. To be included in the analysis, the focal firm must have at least a foreign tier-1 supplier in a given year. Following Wang et al. (2021), we define a tier-2 supplier as a supplier having an indirect link with the focal firm through one of its tier-1 suppliers and exclude the possibility for the focal firm to be its own tier-2 supplier. To be considered in the analysis, we also require the focal firm to have at least 75% of the sample period with identified tier-2 suppliers (Wang et al., 2021). We create a panel dataset where the unit of analysis is the firm, for which we calculate supply network structure measures for each year. This panel dataset features 8,300 firm–year observations representing 853 unique firms.

4.2 Supply chain measures

We use the FactSet dataset to build the supply chain measures. To test hypothesis 1, we generate the variable *Numbsup*, which represents the number of unique customer-supplier relationships for a firm-foreign country dyad in a given year. This variable measures the number of suppliers a firm has in each foreign country in each year. We retrieve the number of customer-supplier relationships from FactSet where we identify US customers, their suppliers and country of origin as well as the starting and ending date of each relationship. We aggregate the number of unique relationships for

each firm-foreign country dyad in each year. *Numbsup* is the dependent variable in hypothesis 1, which tests the effect of political divergence on foreign supply bases.

To test hypotheses 2 and 3, we follow the OSCM literature on supply base complexity (e.g., Choi & Hong, 2002; Fan et al., 2022b) and operationalize *Horizontal Complexity* as the focal firm's number of tier-1 suppliers and *Spatial Complexity* as the number of countries where these tier-1 suppliers are located.

To test hypothesis 4, which is related to tier-2 commonality in the focal firm's supply network, we borrow the diamond scale measure developed by Wang et al. (2021) that we rename *Tier-2 Sharing* in our study. *Tier-2 Sharing* measures "the average degree of pairwise commonality of the focal firm and all its tier-2 suppliers" (Wang et al., 2021, p.2035). In other words, this variable reflects by how many of the focal firm's tier-1 suppliers is the average tier-2 shared. The higher the values of *Tier-2 Sharing* the greater the tier-2 commonality among the tier-1 suppliers, while a value of one indicates no commonality. To calculate *Tier-2 Sharing*, we first construct the adjacency matrix A where each binary element $A_{j,i}$ denotes a relation between supplier j and firm i. We then compute the second-order adjacency matrix A^2 with each element $[A^2]_{j,i}$ denoting the number of indirect relations between tier-2 supplier j and firm i. We ensure that firm i is not its own tier-2 supplier by setting $[A^2]_{i,i} = 0$. Finally, *Tier-2 Sharing* for firm i is calculated as $\sum_j [A^2]_{j,i} / \sum_j \mathbb{1}_{[A^2]_{j,i}>0}$ where $\mathbb{1}$ denotes the indicator function.

4.3 Political divergence measures

We rely on the United Nations General Assembly Voting dataset (Voeten, 2013) to operationalize geopolitical tensions between states. To test hypothesis 1, we generate the variable *Political Divergence*, which measures states' misalignment in global affairs. Each year, nations vote on

many resolutions with respect to economic, political, social and security issues. Disagreement over these issues reflects geopolitical tensions among nations. Our *Political Divergence* variable is based on ideal point distances, which allow comparisons across time and better reflect "state positions toward the US-led liberal order" (Bailey et al., 2017, p. 430) and the political divide that has been prevailing among nations since the end of the cold war (Bailey et al., 2017). The higher the ideal point distance, the greater the political divergence in global affairs for a given country pair.

For hypotheses 2-4, we examine the influence of geopolitical tensions exposure on the firm's supply network structure. Supply base complexity and tier-2 commonality reside within the firm's supplier network, which is not foreign country-specific. Accordingly, we need an aggregate measure of geopolitical tensions that matches our firm-year panel structure. We generate the variable *Political Divergence Exposure*, which reflects the firm's overall exposure to political divergence in a given year. The measure is a weighted average of the firm i number of supplier relationships held in each foreign country f multiplied by the respective *Political Divergence* between the US and each foreign country f in year t. The variable is computed with the following formula:

$$Political\ Divergence\ Exposure_{i,t} = \frac{\sum_f Political\ Divergence_{f,t} \times Numbsup_{i,f,t}}{\sum_f Numbsup_{i,f,t}}.$$

4.4 Control variables

We control for several factors that may affect the firm's global sourcing strategy and supply network structure. We retrieve firms' fundamentals from Compustat. We include total assets (log transformed) and return on assets (ROA) to control for firm size and performance as larger and more profitable firms tend to be more globalized and have more complex supply bases (Shu &

Fan, 2024). We include leverage and market to book ratio (M/B) as financial health and growth prospects are associated with a firm's globalization degree (Dong et al., 2022). We also control for the firm's number of tier-1 suppliers because a firm's opportunities to source from various foreign countries might be related to the size of its supply base. Note that the dependent variable of hypothesis 2 – *Horizontal Complexity* – represents the firm's number of tier-1 suppliers so we do not control for this variable when testing hypothesis 2. At the foreign country level (only for hypothesis 1), we retrieve from the Gravity database (Conte et al., 2022) GDP per capita (log transformed) and a dummy variable indicating whether the US and the foreign country have a trade agreement as economic development and the easiness to trade with the foreign country can influence cross-border relationships (Charpin et al., 2024). Last, for hypothesis 4, we include the number of tier-2 suppliers, which can affect the firm's degree of tier-2 sharing (Wang et al., 2021).

4.5 Model specifications

To test hypothesis 1—the political divergence effect on the firm's foreign supply bases—we rely on a fixed effects linear regression to control for firm and time heterogeneity. Our specification mitigates several endogeneity threats. First, we include firm-foreign country dyad fixed effects to control for time invariant firm characteristics and reduce endogeneity concerns with respect to the firm's decision to engage with a specific country (Antras & Foley, 2015). Second, we include year fixed effects to control for unobservable variables that are constant across firms but vary over time (Hanck et al., 2021). Last, we include industry by year fixed effects to control for industry trends (Charoenwong et al., 2023). Therefore, we capture the variation in *Numbsup* within firm-foreign country dyads when *Political Divergence* varies across time with the following model:

$$Numbsup_{i,f,t} = \beta_0 + \beta_1 Political\ Divergence_{f,t-1} + \alpha_{i,f} + \gamma_t + \alpha_{j(i,t),y(t)} + \delta Controls_{t-1} + \varepsilon_{i,f,t}$$

where $Numbsup_{i,f,t}$ is the number of suppliers firm i has in country f in year t, $Political\ Divergence_{f,t-1}$ is the political divergence between the US and country f, $\alpha_{i,f}$ are the firm-foreign country dyad fixed effects, γ_t are the year fixed effects, $\alpha_{j(i,t),y(t)}$ are the industry by year fixed effects, $Controls_{t-1}$ are a set of control variables described in section 4.4. Specifically, we include a dummy variable indicating whether the US and the foreign country have a trade agreement, the foreign country's log GDP per capita, and the firm's log total assets, leverage, ROA, M/B, and total number of tier-1 suppliers. As such, we control the potential confounding effects of bilateral trade advantage, foreign country economic development, and the firm's size, financial health, profitability, and supply base size on its global sourcing strategy. We lag the independent and control variables by one year to lessen reverse causality. We winsorize firm financial variables at the 1st and 99th percentiles to remove the effect of outliers and cluster the standard errors by firm-foreign country pairs.

To test hypotheses 2-4—the impact of political divergence exposure on the firm's supply network structure—we also use a fixed effects linear regression to estimate the following model:

$$Y_{i,t} = \beta_0 + \beta_1 Political\ Divergence\ Exposure_{i,t-1} + \alpha_i + \gamma_t + \alpha_{j(i,t),y(t)} + \delta Controls_{t-1} + \epsilon_{i,t}$$

where $Y_{i,t}$ is firm i *Horizontal Complexity*, *Spatial Complexity*, or *Tier-2 Sharing* in year t, $Political\ Divergence\ Exposure_{i,t-1}$ is the firm's weighted exposure to political divergence, α_i are the firm fixed effects, γ_t are the year fixed effects, $\alpha_{j(i,t),y(t)}$ are the industry by year fixed effects, and $Controls_{t-1}$ include the firm's log total assets, leverage, ROA, M/B, the number of

tier-1 suppliers (except for hypothesis 2), and the number of tier-2 suppliers (only for hypothesis 4). We winsorize the firm financial variables at the 1st and 99th percentiles, lag the independent and control variables by one year, and cluster the standard errors at the firm level.

Table I, Panel A, presents the descriptive statistics for the variables included in the model testing hypothesis 1, while Panel B, shows the descriptive statistics for the variables included in the models testing hypotheses 2-4.

Table I. Descriptive statistics

	N	Mean	Std. dev.	Min	Max
Panel A: Effect of political divergence on foreign supply bases (Hypothesis 1)					
Numbsup	152,274	0.648	1.64	0	103
Political Divergence	152,274	1.928	0.868	0.11	4.577
Tier-1 Suppliers Total	152,274	38.83	62.31	1	631
Log (total assets)	152,274	8.262	2.292	2.509	13.39
Leverage	152,274	0.222	0.194	0	1.013
ROA	152,274	0.009	0.188	-1.059	0.277
M/B	152,274	3.387	6.718	-27.01	46.71
Log (GDP per capita)	152,274	3.386	0.715	-.209	4.863
Trade Agreement	152,274	0.206	0.404	0	1
Panel B: Effect of political divergence exposure on supply network structures (Hypotheses 2, 3, 4)					
Horizontal Complexity	8,300	25.79	42.33	1	619
Spatial Complexity	8,300	4.785	5.46	1	48
Tier-2 Sharing	8,300	1.233	0.314	1	3.710
Political Divergence Exposure	8,300	1.689	0.557	0.11	4.343
Tier-2 Suppliers Total	8,300	360.5	453.3	0	5,253
Log (total assets)	8,300	7.786	2.13	1.735	12.34
Leverage	8,300	0.216	0.2	0	1.094
ROA	8,300	0.001	0.220	-1.838	0.295
M/B	8,300	3.25	6.176	-24.76	43.22

5. Results

5.1 Main Results

We present our empirical results for hypothesis 1 in Table II. Column 1 shows that the effect of *Political Divergence* on *Numbsup* is negative and statistically significant (β = -0.216, $p < 0.01$).

An increase in geopolitical tensions leads firms to reduce their supply base in countries deemed hostile. The effect size is economically meaningful as a one standard deviation increase in *Political Divergence* reduces *Numbsup* by 11.43% of its standard deviation. Therefore, hypothesis 1 is supported as firms decrease their number of suppliers in countries featuring a high degree of political divergence.

Table II. The effect of political divergence on foreign supply bases

	(1)	(2)	(3)	(4)
Political Divergence	-0.216***	-0.263***	-0.387***	-2.103**
	(0.049)	(0.06)	(0.13)	(1.003)
Tier-1 Suppliers Total	0.012***	0.012***	0.018***	0.012***
	(0.001)	(0.001)	(.002)	(0.001)
Log (total assets)	-0.014	-0.025	-0.068*	-0.007
	(0.014)	(0.02)	(0.04)	(0.015)
Leverage	0.042	0.029	-0.032	0.052
	(0.046)	(0.071)	(0.12)	(0.048)
ROA	-0.006	0.011	-0.058	-0.01
	(0.024)	(0.046)	(0.048)	(0.026)
M/B	0.004	0.003	0.004	0.005
	(0.006)	(0.09)	(0.013)	(0.006)
Log (GDP per capita)	0.462***	0.485***	2.02***	0.447***
	(0.115)	(0.136)	(0.501)	(0.111)
Trade Agreement	0.229***	0.195***	0.605	0.096
	(0.072)	(0.067)	(0.455)	(0.103)
Constant	-0.874**	-0.776*	-5.024***	
	(0.347)	(0.418)	(1.658)	
Observations	152,274	100,252	55,312	152,274
Number of focal firms	2,858	678	2,807	2,858
Firms present in all years		Yes		
Numbsup>0			Yes	
2SLS				Yes

Notes: All models include firm-foreign country dyad fixed effects, year fixed effects, and industry by year fixed effects. Robust standard errors are in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table III presents the regression results for hypotheses 2-4. With respect to supply base complexity, columns 1 and 2 show that *Political Divergence Exposure* increases both *Horizontal Complexity* ($\beta = 2.362$, $p < 0.01$) and *Spatial Complexity* ($\beta = 0.417$, $p < 0.01$). A one standard

deviation increase in *Political Divergence Exposure* increases *Horizontal Complexity* by 3.11% of its standard deviation and *Spatial Complexity* by 4.25% of its standard deviation respectively. We hypothesized that a high degree of exposure to political tensions was positively associated with supply base complexity. Our results support hypotheses 2 and 3 as firms increase their horizontal and spatial complexity when they are exposed to greater degrees of political divergence. Column 3 indicates that the effect of *Political Divergence Exposure* on *Tier-2 Sharing* is positive and statistically significant at the 10% level ($\beta = 0.009$, $p < 0.1$). A one standard deviation increase in *Political Divergence Exposure* is associated with an increase of 1.60% in *Tier-2 Sharing* relative to its standard deviation. Therefore, although we find moderate statistical support for hypothesis 4, exposure to geopolitical tensions plays a reasonable role in increasing tier-2 suppliers' commonality among the focal firm's tier-1 suppliers.

Table III. The effect of political divergence exposure on supply network structures: main results

	(1) **Horizontal**	(2) **Spatial**	(3) **Tier-2 Sharing**
Political Divergence Exposure	2.362***	0.417***	0.009*
	(0.614)	(0.098)	(0.005)
Log (total assets)	1.697*	0.105	0.015*
	(0.894)	(0.112)	(0.008)
Leverage	1.916	0.873**	-0.001
	(2.87)	(0.39)	(0.27)
ROA	-3.027**	-0.119	0.009
	(1.246)	(0.179)	(0.013)
M/B	-0.02	0.011**	0.004
	(0.042)	(0.005)	(0.002)
Tier-1 Suppliers Total		0.105***	0.014***
		(0.009)	(0.003)
Tier-2 Suppliers Total			0.009***
			(0.002)
Constant	8.238	0.486	1.034***
	(6.901)	(0.891)	(0.063)
Observations	8,300	8,300	8,300
Number of focal firms	853	853	853

Notes: All models include firm fixed effects, year fixed effects, and industry by year fixed

effects. Robust standard errors are in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

5.2 Robustness tests

We conduct additional tests to check the robustness of the results supporting hypothesis 1. In Table II, column 2, we run the regression of *Numbsup* on *Political Divergence* only for firms that are present in all years of our 2003-2019 sample period (i.e. a balanced panel). In other words, to be included in the analysis, the firm must have engaged in global sourcing (i.e., at least one foreign supplier) in each year of the sample period. Accordingly, the number of firms decreases from 2,858 to 678 in this specification. This test allows us to focus on firms that rely continuously on global sourcing. The impact of geopolitical tensions on foreign supply bases remains negative and statistically significant (β = -0.263, $p < 0.01$). In column 3, we impose an additional restriction by only retaining firm-foreign country dyads that feature at least one supplier relationship (i.e., *Numbsup*>0). As such, we exclude observations for which the firm-foreign country dyad is present in the dataset but has no supplier in this specific country (i.e., the firm has at least one foreign supplier that year but in another country). By adding this restriction, we ensure that each firm-foreign country dyad in our sample is active—that is, the firm sources from all the countries present in the dataset in a given year. Thus, we can assess whether the focal firm reduces its supplier relationships in countries where it has active supply bases. We find that the negative effect of *Political Divergence* on *Numbsup* remains statistically significant (β = -0.387, $p < 0.01$).

Albeit we include many fixed effects to control for factors at the firm, country, industry, and time levels, our model may still be exposed to an omitted variable bias. To address this endogeneity concern, we instrument our endogenous regressor *Political Divergence* with *Tourist Flows*, a variable capturing tourist flows between the US and the foreign countries present in our

dataset. The logic behind the selection of this instrument is the following: while tourist flows between countries are related to geopolitical tensions, they do not influence directly firms' decision-making with respect to supply base locations. We run a two-stage least square regression (2SLS) by instrumenting *Political Divergence* with *Tourist Flows*. The underidentification and weak identification tests are both significant ($p < 0.01$) showing that *Tourist Flows* is neither underidentified or weak and is thus a valid instrument. Column 4 shows the 2SLS results and confirms that geopolitical tensions have a statistically significant negative effect ($\beta = -2.103$, $p < 0.05$) on foreign supply bases.

Table IV introduces the robustness test results for hypotheses 2-4. In columns 1, 2, and 3, we exclude firms that are not present in all years of the sample period and our results remain qualitatively similar. In columns 4, 5, and 6, we replace our measure of *Political Divergence Exposure* (weighed by the number of supplier relationships in each foreign country) by the firm's average exposure to political divergence (i.e., without the supplier weights). We conduct this test out of concern for the estimation of *Horizontal Complexity*, which measures the firm's number of tier-1 suppliers. By withdrawing the supplier weights from *Political Divergence Exposure*, we remove the endogeneity concern of using the number of tier-1 suppliers to compute the regressor. We run the three regressions with our alternative regressor *Average Political Divergence,* and the results remain the same.

Table IV. The effect of political divergence exposure on supply network structures: robustness tests

	(1) **Horizontal**	(2) **Spatial**	(3) **Tier2-Sharing**	(4) **Horizontal**	(5) **Spatial**	(6) **Tier2-Sharing**
Political Divergence Exposure	2.528***	0.481***	0.012**	2.78***	0.437***	0.011**
	(0.788)	(0.121)	(0.006)	(0.595)	(0.097)	(0.005)
Log (total assets)	3.179**	0.251	0.005	1.68*	0.103	0.015*
	(1.275)	(0.152)	(0.01)	(0.893)	(0.112)	(0.008)
Leverage	2.196	1.329**	-0.046	1.88	0.868**	-0.003
	(4.563)	(0.6)	(0.037)	(2.868)	(0.389)	(0.27)
ROA	-5.663***	-0.201	0.019	-3.025**	-0.121	0.009
	(2.133)	(0.268)	(0.021)	(1.248)	(0.179)	(0.013)
M/B	-0.024	0.012*	0.002	-0.019	0.011**	0.004
	(0.055)	(0.007)	(0.003)	(0.042)	(0.005)	(0.003)
Tier-1 Suppliers Total		0.102***	0.014***		0.105***	0.014***
		(0.009)	(0.003)		(0.009)	(0.003)
Tier-2 Suppliers Total			0.007***			0.008***
			(0.002)			(0.002)
Constant	0.142	-0.689	1.131***	7.608	0.462	1.031***
	(10.395)	(1.256)	(0.083)	(6.902)	(0.886)	(.063)
Observations	6,266	6,266	6,266	8,300	8,300	8,300
Number of focal firms	593	593	593	853	853	853
Firms present in all years	Yes	Yes	Yes			
Average Political Divergence				Yes	Yes	Yes

Notes: All models include firm fixed effects, year fixed effects, and industry by year fixed effects. Robust standard errors are in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

We use one-year lags to observe the effects of geopolitical tensions on foreign supply bases and supply network structures one year later. Using a one-year time lag is typical to analyze the effects of changes in the firm's external environment on supply chain adjustments (e.g., Fan & Xiao, 2023; Leung et al., 2021; Shu & Fan, 2024). Nevertheless, we acknowledge that reconfiguring supply chains to address geopolitical tensions can take more time. In Appendix B, we rerun the analyses for hypotheses1–4 with two-year lags. Our results are consistent with the original analyses. The two-year lag results show coefficients with greater magnitudes than those from the one-year lag results and the two-year lag effect for *Tier-2 Sharing* has a higher significance level (p<0.01) compared to the one-year lag results (p<0.1). These findings suggest

that supply chain reconfiguration associated with geopolitical tensions takes on average, more than one year to materialize.

6. Discussion

This study shows that geopolitical tensions, operationalized as political divergence in global affairs, affect foreign supply bases and supply network structures. Our results have important theoretical and practical implications for global sourcing and supply chain risk management.

6.1 Theoretical contributions

First, we contribute to the OSCM literature on global supply chain reconfiguration by showing that geopolitical tensions lead firms to reduce their foreign supply bases. Our findings provide quantitative support for qualitative studies that indicate firms intend to reorganize their supply bases to mitigate the impact of geopolitical disruptions on their operations (e.g., Moradlou et al., 2021; Roscoe et al., 2020). Results for hypothesis 1 are in line with tenets of both the TCE and RDT. On the one hand, the nature of political relations between governments is a source of environmental uncertainty, which affects transaction costs in international business. Geopolitical tensions enhance these transaction costs as they increase the likelihood of a government's intervention in cross-border transactions (Bertrand et al., 2016). Our findings show that political divergence adversely affects global sourcing activities and thus complement studies on other cross-border transactions such as acquisitions (Yoon et al., 2021) and research collaborations (Charpin et al., 2024). On the other hand, firms want to lower their dependency on partners who may act opportunistically during a geopolitical conflict. Reducing locational dependency has become prominent in the strategy literature (Jiang et al., 2023) because governments may perceive foreign partners as an external threat (Bertrand et al., 2016). Friendshoring is built on the same logic, as it

advocates to reduce supply dependency with politically non-aligned countries. Our study shows support for this practice as firms reduce their foreign supply bases when they are exposed to heightened political divergence.

Second, this research contributes to the literature on supply base complexity. We find that firms increase their horizontal and spatial complexity when their supply base is exposed to a higher degree of political divergence. Results for hypotheses 2 and 3 are consistent with RDT, which posits that firms search alternative options to reduce their dependency on suppliers located in at-risk countries. Darby et al. (2020) found that firms did not increase their inventory to mitigate policy risk and suggested that these firms may use other buffering strategies such as shifting production locations. Our results support Darby et al.'s (2020) suggestion and extend their work on the influence of the government on resource dependency, as we examine this impact within the framework of bilateral state relations. In the context of geopolitical disruptions, Fan et al. (2024) highlighted the role of RDT from the perspective of suppliers that can "lock in" foreign buyers through superior competencies. In contrast, our study adopts the buyer's perspective and posits that increasing horizontal and spatial complexity can help firms mitigate the risk of being locked into such supply dependency.

Our results align with conceptual studies suggesting that firms engage in multi-sourcing—both in terms of the number of suppliers and their locations—to mitigate geopolitical disruptions (Chae et al., 2019; Cohen & Lee, 2020; Sodhi et al., 2023). These findings may be surprising from a TCE perspective, which posits that firms reduce their supply base complexity after a disruption (e.g., Son et al., 2021) to optimize the use of their resources (Choi & Krause, 2006). We advance that while TCE explains the reduction in supply base complexity after the negative effects of a disruption, RDT indicates that firms increase their supply base complexity to avoid severe

disruptions in the first place. In other words, firms favor redundancy over simplicity in their supply base when facing geopolitical tensions. For instance, Apple has expanded its supply base in India and Vietnam amid the ongoing tensions between the US and China (Swint, 2023). A paradox is that increasing supply base complexity can increase the likelihood of disruptions in the firm's supply network (Bode & Wagner, 2015; Wissuwa et al., 2022). Therefore, as firms implement multi-sourcing strategies to mitigate geopolitical tensions, they also expose their supply network to propagation risks—our last point.

Third, we contribute to the literature on supply chain risk management. Results for Hypothesis 4 show that exposure to geopolitical tensions is associated with an increase in tier-2 supplier sharing in the firm's supply network. When firms tend to avoid foreign countries with a high degree of political divergence, they reduce the potential pool of tier-2 suppliers that its tier-1 suppliers can tap into. Although the number of tier-1 suppliers increases in the firm's supply base, they are more likely to share the same suppliers, which can increase the propagation effect of a disruption in the upstream network. Our findings highlight a potential unintended consequence of global supply chain reconfiguration strategies, such as friendshoring, in addressing geopolitical tensions: an increased exposure for firms to propagation effects within their supply networks.

6.2 Practical contributions

Our study also has implications for practitioners involved in global sourcing, whose decisions are increasingly entangled in political feuds between nations. First, our study highlights the importance of acknowledging that the political environment affecting the firm extends beyond just the buyer and supplier countries to include bilateral political relations between nations. This point is increasingly difficult to ignore for managers who are pressured and sometimes forced to adapt their sourcing strategies to their government's political agenda. This agenda is highly dependent

on the political divergence between the buyer and supplier's respective governments. As geopolitical tensions rise, the potential for supply disruptions and associated supply base location adjustments are expected to increase. Practitioners must monitor closely political divergence to anticipate its impact on the firm's foreign supply bases.

Second, managers who decide to add redundancy in their supply base to mitigate these geopolitical tensions should proceed with caution. As risk averse firms are advised to increase their horizontal and spatial complexity to mitigate disruptions (Lee & Moon, 2024), the additional complexity can have negative repercussions on the firm's financial performance (Fan et al., 2022b; Lu & Shang, 2017). Practitioners should also ensure that their global supply chain reconfiguration does not result in a radical increase in their tier-2 supplier sharing, which is a source of financial (Wang et al., 2021) and disruption (Ang et al., 2017) risks. Supply networks become less responsive when supply base complexity increases (Choi & Krause, 2006). Accordingly, friendshoring comes with its own set of complexities. Not only it reduces the number of sourcing locations available to the firm, but it also introduces a notion of "friend" which is unclear and dynamic. In this context, practitioners should face increasing difficulties to freely access the best supply options, and when they do, they will face increased competition to procure from them.

Reconfiguring a global supply chain according to the political needs of the time increases transaction costs because firms must spend resources and efforts to search and develop new foreign supply bases. A major issue is the uncertainty associated with how long the new location will remain "a friend" in a very dynamic political environment. As firms reduce their dependency on supply bases in hostile countries, they become increasingly reliant on a new set of countries. In other words, friendshoring may substitute supply dependence on one country for another rather than eliminating it.

6.3 Limitations and future research

Our research has limitations that could be explored in future research. First, our study focuses on US firms and how political divergence between the US government and foreign nations affects their foreign supply bases and their supply network structures. Future research could examine the effect of geopolitical tensions on firms from other geographical areas. For instance, it would be interesting to study how political divergence between China and the US, Canada, and many European countries has altered Chinese firms' supply chain networks and practices. In addition, the recent 2022 Russian invasion of Ukraine has led many countries to implement sanctions on the Russian economy. Future research could investigate how Russian firms have addressed these sanctions in terms of foreign sourcing strategies.

Second, our supply chain measures are derived from FactSet which, like other supply chain databases (e.g., Bloomberg SPLC, Mergent Supply Chain), has limitations (Culot et al., 2023). To ensure data representativeness, we focus on US publicly traded firms, as private firms are poorly represented in the database. Therefore, our results are not generalizable to private and small and medium enterprises, which future research could investigate with other data sources. Alternatively, researchers could rely on qualitative data collection methods, such as interviews, to mitigate the lack of comprehensive databases on private and small and medium enterprises. Furthermore, our *Tier-2 Sharing* measure cannot ensure that materials provided by tier-2 suppliers to tier-1 suppliers are then used by the focal firm. Therefore, our measure for hypothesis 4 offers a global picture of the focal firm's sub-tier network rather than an exact account of material flows among the different tiers. Future research could try to corroborate our results using other data sources that allow the recreation of precise multitier supply chain flows on a large scale. Another option would be to use

an in-depth case study to investigate the effect of geopolitical tensions on the multitier supply chain flows of a few selected firms.

Third, we investigate the covert role of political divergence in global affairs to capture the broad influence of friendshoring among firm's global sourcing practices. As friendshoring is becoming increasingly manifest, future research could study the impact of overt friendshoring initiatives on global supply chains reconfiguration. For instance, the US CHIPS and Science Act prohibits firms funded by the US government from assisting China in developing its semiconductor industry (Luo & Van Assche, 2023) and the Minerals Security Partnership aims to reduce the dependence of the US and its allies on China's supply of critical minerals (Vivoda, 2023). The enactment of these policies will strongly influence firms' decisions regarding supply chain reconfiguration.

Lastly, our study shows that firms increase their supply base complexity to cope with geopolitical tensions. However, adding redundancy to a firm's supply base can also increase supply risk through propagation effects in the supply network. Future research could explore the trade-off between redundancy and dependency in the context of geopolitical tensions. For example, researchers could investigate the optimal level of supply base complexity needed to enhance supply chain resilience during geopolitical conflicts.

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Appendix A. Number of observations per foreign country

Supplier country	Frequency	Percent	Supplier country	Frequency	Percent
Argentina	674	0.44	Lithuania	83	0.05
Australia	5,301	3.48	Luxembourg	2,352	1.54
Austria	1,267	0.83	Malaysia	1,818	1.19
Bahamas, the	324	0.21	Malta	135	0.09
Bahrain	125	0.08	Marshall Islands	2	0.00
Bangladesh	251	0.16	Mauritius	221	0.15
Belgium	2,389	1.57	Mexico	2,912	1.91
Bolivia	16	0.01	Mongolia	3	0.00
Botswana	33	0.02	Morocco	63	0.04
Brazil	2,249	1.48	Myanmar	34	0.02
Bulgaria	118	0.08	Namibia	19	0.01
Canada	10,114	6.64	Netherlands	5,934	3.90
Chile	1,072	0.70	New Zealand	1,455	0.96
China	6,485	4.26	Nigeria	215	0.14
Colombia	247	0.16	Norway	2,161	1.42
Costa Rica	75	0.05	Oman	211	0.14
Côte d'Ivoire	17	0.01	Pakistan	654	0.43
Croatia	185	0.12	Panama	59	0.04
Cyprus	433	0.28	Peru	485	0.32
Czech Republic	245	0.16	Philippines	1,264	0.83
Denmark	2,222	1.46	Poland	1,510	0.99
Dominica	17	0.01	Portugal	443	0.29
Ecuador	9	0.01	Qatar	282	0.19
Egypt	534	0.35	Romania	44	0.03
El Salvador	5	0.00	Russia	1,100	0.72
Estonia	65	0.04	Saudi Arabia	735	0.48
Finland	2,577	1.69	Sierra Leone	45	0.03
France	8,194	5.38	Singapore	3,535	2.32
Georgia	10	0.01	Slovakia	152	0.10
Germany	9,175	6.03	Slovenia	32	0.02
Ghana	11	0.01	South Africa	1,444	0.95
Greece	775	0.51	South Korea	5,209	3.42
Guatemala	3	0.00	Spain	2,452	1.61
Guinea	2	0.00	Sri Lanka	361	0.24
Hungary	82	0.05	St. Kitts and Nevis	12	0.01
Iceland	135	0.09	Suriname	11	0.01
India	5,973	3.92	Sweden	4,878	3.20
Indonesia	1,394	0.92	Switzerland	6,305	4.14
Ireland	4,230	2.78	Thailand	1,488	0.98
Israel	5,869	3.85	Trinidad and Tobago	38	0.02
Italy	4,189	2.75	Tunisia	40	0.03

Jamaica	69	0.05	Turkey	1,228	0.81
Japan	9,235	6.06	Ukraine	85	0.06
Jordan	127	0.08	United Arab Emirates	923	0.61
Kazakhstan	76	0.05	United Kingdom	11,823	7.76
Kenya	32	0.02	Uruguay	106	0.07
Kuwait	357	0.23	Venezuela	126	0.08
Laos	2	0.00	Vietnam	625	0.41
Latvia	44	0.03	Zimbabwe	118	0.08
Lebanon	11	0.01	**Total**	**152,274**	**100**

Appendix B. Results for hypotheses 1-4 with two-year lags

	(H1) **Numbsup**	(H2) **Horizontal**	(H3) **Spatial**	(H4) **Tier-2 Sharing**
Political Divergence	-0.335***			
	(0.051)			
Political Divergence Exposure		3.025***	0.422***	0.015***
		(0.753)	(0.118)	(0.005)
Log (total assets)	-0.002	1.677*	0.165	0.009
	(0.129)	(0.897)	(0.137)	(0.009)
Leverage	0.002	1.546	0.745*	-0.004
	(0.27)	(2.423)	(0.423)	(0.021)
ROA	0.002	-0.053	-0.006	-0.002
	(0.032)	(0.066)	(0.009)	(0.006)
M/B	-0.003	-0.001	0.001	0.002
	(0.004)	(0.001)	(0.007)	(0.014)
Tier-1 Suppliers Total	0.009***		0.09***	0.014***
	(0.001)		(0.009)	(0.003)
Tier-2 Suppliers Total				0.004**
				(0.002)
Log (GDP per capita)	0.551***			
	(0.126)			
Trade Agreement	0.203***			
	(0.069)			
Constant	-0.89**	8.735	0.761	1.097***
	(0.374)	(7.127)	(1.125)	(0.072)
Observations	144,710	7,163	7,163	7,163
Number of focal firms	2,715	804	804	804

Notes: All models include year fixed effects and industry by year fixed effects. In addition, column (1) includes firm-foreign country dyad fixed effects, while columns (2), (3), (4) include firm fixed effects. Robust standard errors are in parentheses.
*** p<0.01, ** p<0.05, * p<0.1