De-Risking from China: How US Firms Reconfigure Sourcing Through Decoupling, Diversification, and Friendshoring Across Geopolitical Disruptions

Remi Charpin[1]
HEC Montreal
Department of Logistics and Operations Management
3000 Chemin de la Côte-Sainte-Catherine, Montréal, QC H3T 2A7
remi.charpin@hec.ca

Martin Cousineau
HEC Montreal
Department of Logistics and Operations Management
3000 Chemin de la Côte-Sainte-Catherine, Montréal, QC H3T 2A7
martin.cousineau@hec.ca

Di Fan
The Hong Kong Polytechnic University
Business Division, School of Fashion and Textiles
11 Yuk Choi Rd, Hung Hom, Kowloon, Hong Kong
d.fan@polyu.edu.hk

How to cite this article
Charpin, R., Cousineau, M., and Fan, D. (2026), "De-risking from China: How U.S. firms reconfigure sourcing through decoupling, diversification and friendshoring across geopolitical disruptions", *International Journal of Operations & Production Management*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/IJOPM-02-2026-0240

This manuscript is the accepted author version of the article. The final authenticated version is available online via the publisher at the DOI above.

[1] Corresponding author: Remi Charpin, 3000 Chemin de la Côte-Sainte-Catherine, Montréal, QC H3T 2A7, Tel : 514 340-6066, Fax : n/a, email : remi.charpin@hec.ca

De-Risking from China: How US Firms Reconfigure Sourcing Through Decoupling, Diversification, and Friendshoring Across Geopolitical Disruptions

Purpose – We examine whether US firms use three location strategies—decoupling, diversification, and friendshoring—to de-risk their sourcing portfolios. We investigate how the use of these strategies varies across bilateral (2018 US–China trade war), systemic (COVID-19 pandemic) and alliance-based (Russia–Ukraine war) shocks. We also test whether firms operating in high-tech industries de-risk more aggressively.

Design/methodology/approach – Using Panjiva US seaborne import records, we build firm-year measures of the three strategies for 1,565 US firms over 2011–2024. We then estimate fixed-effects models that interact firm's pre-disruption China exposure with the three disruption periods and a high-tech indicator.

Findings – Highly China-exposed firms decouple during all three disruptions, with decoupling switching on sharply at the trade war. Diversification activates specifically at the COVID-19 pandemic. Friendshoring peaks during the COVID-19 pandemic and reverses once the war begins. Sourcing portfolios appear more diversified and politically aligned, but these gains vanish once the China sourcing share is excluded, revealing them as mechanical by-products of decoupling. High-tech firms generally do not de-risk more than their peers.

Originality/value – We move the study of de-risking from perception-based case evidence to large-scale observed sourcing behavior. We conceptualize decoupling, diversification, and friendshoring as three sourcing location strategies and match each to its most salient disruption type, laying the groundwork for a contingency theory of strategy–shock fit. We further show that portfolio-wide indices of diversification and political alignment may overstate genuine de-risking because they incorporate the effects of decoupling. Moreover, policymakers' ambitions to de-risk high-tech industries and promote friendshoring have generated only a limited corporate response.

Keywords: COVID-19 pandemic; geopolitical risk; Russia–Ukraine war; Sourcing location strategy, Supply chain resilience; Trade war

1. Introduction

Location decisions in operations and supply chain management (OSCM) lie at the core of global supply chain configuration strategies. While competitive factors once dominated these decisions (e.g., MacCarthy & Atthirawong, 2003), geopolitical considerations now carry increasing weight in the reconfiguration of firms' location portfolios (Roscoe et al., 2022). Indeed, as global crises have multiplied, disruption has become the new normal, and supply chains are now expected to be as resilient as they are efficient (Cohen & Kouvelis, 2021). Against this backdrop, "de-risking" supply chains has become an imperative for governments and firms alike as they confront a succession of disruptions caused by trade wars, a pandemic, and a resurgence of military conflicts. In this study, we focus on the sourcing dimension of de-risking, which we view not merely as a response to geopolitical disruptions[2] but as a set of location strategies.

This point is best illustrated by the March 2023 speech in which the President of the European Commission, Ursula von der Leyen, introduced the term de-risking. Her economic de-risking agenda to build more resilient supply chains rested on four levers: reducing dependence, increasing diversification, cooperating with politically aligned countries, and using trade-policy instruments (von der Leyen, 2023). The first three levers map onto decisions that firms make about where they source, whereas the fourth remains a governmental lever. Building on this logic, we define de-risking as *a sourcing location strategy that reconfigures the firm's sourcing portfolio along three dimensions. These are decoupling (reducing exposure to a focal source), diversification (altering the portfolio's dispersion), and friendshoring (adjusting its political alignment)*. We consider these dimensions jointly because they are complementary. Friendshoring and diversification determine where decoupled volumes go, so that reducing one exposure does not recreate another. Yet OSCM research has so far examined them largely one dimension at a time (e.g., Fan et al., 2024; Klarin & Sosnovskikh, 2025; Niu et al., 2025), or at most in pairs

[2] To avoid redundancy, we use "geopolitical" and "global" interchangeably and refer to the events broadly as "disruptions" or "crises"; "shock" denotes their specific types (bilateral, systemic, alliance-based).

(Free et al., 2026; Lei et al., 2026), with only Cichanowicz et al. (2026) gathering the three under the de-risking term in the context of foreign direct investment.

The OSCM field offers a rich literature on location-decision strategies. On the one hand, these strategies are multi-criteria as firms balance manufacturing and international-business determinants (Brush et al., 1999) and must weigh many factors such as costs, labor, and infrastructure (MacCarthy & Atthirawong, 2003). On the other hand, location decisions are not isolated, discrete country choices; they must account for the design of the broader supply chain network (Cohen and Lee, 2020). Geopolitical risk brings these two considerations together. It has become a key factor in firms' location decisions because it has acted as a major source of disruption to their supply chain networks. Importantly, geopolitical risk does not replace the cost, capability, and infrastructure considerations that have long shaped location decisions. Rather, it adds a further criterion that firms must weigh when reconfiguring where they source. Consequently, researchers have increasingly examined the impact of geopolitical disruptions on global supply chain reconfiguration (Bednarski et al., 2025).

To date, research at the intersection of geopolitical disruptions and location strategies has relied largely on qualitative case studies of individual crises, such as Brexit (e.g., Moradlou et al., 2021), the US–China trade war (e.g., Ren et al., 2024), or the Russia–Ukraine war (e.g., Srai et al., 2023). A few studies consider several crises (Moradlou et al., 2025; Roscoe et al., 2022), but because the crises they examine are tied to the specific firms studied, we still lack a systematic account of how a common set of firms responds across different types of disruption. Closer to our focus, two studies examine de-risking directly through interviews with foreign firms in China (Day et al., 2025) and a content analysis of relocation announcements out of China (Free et al., 2026). While timely and insightful, this body of work shares some limitations. First, it relies on small or self-selected samples that capture stated intentions or publicized decisions rather than firms' actual sourcing behavior. Second, although decoupling, diversification, and friendshoring are complementary and could be deployed in combination, it has not studied them together. Third, it rarely compares how firms respond across crises of different types. The purpose of this study is therefore to quantitatively examine the concurrent use of three sourcing location

strategies—decoupling, diversification, and friendshoring—that firms use to de-risk their sourcing portfolios across several recent geopolitical disruptions. Studying which complementary strategies firms actually use across disruptions would move location-strategy research from fragmented case evidence to a more holistic account of de-risking, and show whether policymakers' de-risking ambitions translate into firm-level responses.

We study three geopolitical disruptions that differ in nature to learn which de-risking strategies firms favor under different circumstances. First, the 2018 US–China trade war—a bilateral shock—marked the end of a largely untroubled era of globalization and pushed firms with China-sourcing exposure to reconfigure their sourcing locations (Fan et al., 2024). Second, the COVID-19 pandemic—a systemic shock—caused supply chain disruptions of a scale unseen in recent history (Ivanov, 2020). This crisis quickly turned geopolitical, accelerating protectionist interventions (Bednarski et al., 2025; Charpin, 2022) and forcing firms to re-evaluate their reliance on geographically concentrated sourcing hubs (Evenett, 2020). Third, the 2022 Russia–Ukraine war[3]—an alliance-based shock—further polarized the world into competing blocs and gave rise to friendshoring, or the notion of sourcing from politically aligned countries (Klarin & Sosnovskikh, 2025). Moreover, high-technology (high-tech hereafter) sectors have been at the heart of these tensions, especially between the US and China. Because advanced technologies are seen as critical to national competitiveness and security, they have become both a driver and a target of geopolitical rivalry (Luo and Van Assche, 2023). This rivalry over the control of key technologies has led governments to restrict certain cross-border technological exchanges (Luo, 2022), generating supply disruptions (Tse et al., 2024). High-tech firms may therefore be among the most active in de-risking their sourcing during geopolitical crises. Yet whether firms follow this de-risking logic, and whether high-tech firms lead in doing so, is far from obvious. Because firms weigh geopolitical risk against many factors, it is unclear whether it drives a response at all or whether different disruptions call for

[3] Although the Russia-Ukraine conflict began in 2014, we use 2022, the year of Russia's full-scale invasion of Ukraine, as the relevant date for our analysis. This event transformed the conflict into an alliance-based shock with global repercussions and elevated friendshoring to a prominent policy and supply-chain concept. Thereafter, we refer to this conflict as the Russia-Ukraine war.

different strategies while for high-tech firms, scarce alternatives and high switching costs may blunt the response further. Accordingly, we pose two research questions:

> 1) Do firms use decoupling, diversification, and friendshoring to de-risk their sourcing location portfolios, and how does this use vary across bilateral (2018 US–China trade war), systemic (COVID-19 pandemic), and alliance-based (Russia–Ukraine war) shocks?
>
> 2) Is the de-risking response stronger for firms operating in high-tech industries?

To address these questions, we leverage US seaborne import data from the Panjiva database to retrace the aggregated annual imports of US companies by country of origin. From these data, we build firm-year measures of the decoupling, diversification, and friendshoring strategies and estimate fixed-effects models for a panel of 1,565 US firms over 2011-2024. China offers a salient setting for these dynamics as the world's long-dominant sourcing hub to which US firms were most exposed. It was also directly targeted by the trade war, exposed as a critical dependence during the COVID-19 pandemic, and an explicit target of friendshoring policies. Because de-risking is most consequential for firms with high sourcing exposure to China, we interact each firm's pre-disruption China exposure with indicators for the three disruption periods. Doing so allows us to compare how more- and less-exposed firms reconfigure their sourcing portfolio during each disruption. We then add a triple interaction with a high-tech indicator to test whether high-tech firms de-risk more aggressively.

We find that firms with greater China exposure decouple significantly during all three disruptions, with the response switching on sharply at the trade war. Their portfolios also appear more diversified during the COVID-19 pandemic and the Russia–Ukraine war, and more politically aligned during the pandemic. However, once the China sourcing share is removed from these measures, the remaining portfolio shows no genuine diversification, and its political alignment deteriorates rather than improves. These apparent gains are thus largely mechanical by-products of decoupling. The timing of the responses points to a partial strategy–shock fit. Decoupling activates at the bilateral trade war and diversification at the systemic pandemic shock, whereas friendshoring does not materialize at the alliance-based war for which it is intended. Finally, high-tech firms do not de-risk more

aggressively than other firms, except that they politically realigned their non-China sourcing base during the trade war.

This study makes three main contributions to the OSCM literature. First, we contribute to the location-strategy literature by theorizing de-risking sourcing location portfolios in the context of geopolitical risk as a combination of decoupling, diversification, and friendshoring strategies. We further bring conceptual clarity to the often-conflated concepts of de-risking and decoupling. We position decoupling as a component of de-risking, conceptualize decoupling as a continuous process rather than a binary severance of ties, and show that de-risking extends beyond diversification alone. Second, we contribute to the supply-network literature by showing that portfolio-wide measures of diversification and political alignment are mechanically tied to decoupling. Thus, studies assessing de-risking using only full-portfolio measures may conclude that firms have diversified or realigned when they have merely decoupled. Third, we contribute to the literature on geopolitical disruptions by matching each strategy to its most salient type of disruption, laying the groundwork for a contingency theory of strategy–shock fit grounded in observed sourcing behavior. Beyond theory, our findings imply that managers should evaluate de-risking on the portfolio that remains after decoupling rather than on full-portfolio metrics. They should also recognize the limits of each strategy, as no single strategy delivers a fully de-risked sourcing portfolio. For policymakers, ambitions to de-risk high-tech industries and promote friendshoring translate only weakly into firm action.

2. Literature review

2.1. Location strategy

Where to locate production and sourcing has long been a central concern of OSCM. We organize this literature into three streams that together motivate our study: location strategy as a multi-criteria decision, location strategy as the configuration of a network or portfolio, and the recent stream on geopolitical disruptions.

First, OSCM researchers characterize location as a multi-criteria decision rather than a response to any single factor. Multinational plant-location decisions combine an array of manufacturing strategies and international business determinants rather than cost

alone (Brush et al. 1999). MacCarthy and Atthirawong (2003) reach a similar conclusion through a worldwide Delphi study, ranking costs, infrastructure, labor characteristics, government and political factors, and economic conditions as the leading determinants of international location decisions. Subsequent work confirms that the decision has only grown more complex as it hinges on total-cost-of-ownership assessment (Ellram et al., 2013) and the inclusion of factors that go beyond location advantages such as perception of opportunism (Ellram et al., 2008) and country reputational risk (Nujen et al., 2021). Cohen et al.'s (2018) study of firms' actual sourcing decisions confirms that labor cost no longer dominates, with firms instead weighing complex tradeoffs of operational, market, and policy factors along with supply chain risk factors. This stream establishes that, among the multitude of criteria firms weigh in their location strategy, risk has taken on an increasingly important role.

Second, a complementary stream treats location not as a discrete, one-off country choice but as the configuration of a broader network or portfolio. Building on Ferdows's foreign factories framework (1997), Vereecke and Van Dierdonck (2002) show that plants occupy distinct strategic roles within manufacturing networks and are best understood as interdependent nodes rather than standalone facilities. These nodes are connected not only by physical flows but also by knowledge flows (Vereecke et al., 2006). As production has increasingly shifted from owned plants to outsourced suppliers, Cohen and Lee (2020) extend this network logic to global sourcing, framing the supply network as a structure that firms can reconfigure to mitigate the many risks they face when operating globally. This portfolio perspective matters for our purposes because it shifts attention from a single location decision to portfolio-level properties such as the dependence of a firm on a focal source, and the dispersion and political alignment of its location portfolio. These are the three dimensions along which our de-risking strategy operates.

Third, a more recent stream examines how geopolitical disruptions reshape location strategies. Long overlooked in OSCM, this stream has grown rapidly as a succession of unexpected geopolitical events has challenged taken-for-granted supply chain designs (Bednarski et al., 2025). The stream began with Brexit, which led firms to relocate production and distribution facilities between the UK and the EU in pursuit of location

advantages (Moradlou et al., 2021). Soon after, the 2018 US–China trade war hurt the performance of US firms reliant on Chinese suppliers (Fan et al., 2022) and pushed them to shrink their supply base in China (Fan et al., 2024). Similarly, New Zealand and Australian exporters rebalanced their export markets toward alternative countries during the trade war (Ren et al., 2024). During the COVID-19 pandemic, US firms reallocated volumes among their existing sourcing locations rather than entering new ones (Niu et al., 2025), and although reshoring was floated to reduce dependence on China, it was rarely implemented because of logistical and demand challenges (van Hoek & Dobrzykowski, 2021). The Russia–Ukraine war, in turn, led some firms to sever their supply chain ties with Russia (Srai et al., 2023). From a theoretical standpoint, how firms reconfigured their location portfolios depended on perceived institutional pressures and the mobility of supply chain assets (Roscoe et al., 2022), as well as on the geographic dispersion of the supply network and the time available to managers to adapt (Moradlou et al., 2025).

In sum, location is a multi-criteria decision in which risk is increasingly central, best understood at the portfolio level, and now reshaped by geopolitical crises. Yet the insights on geopolitical disruptions and location strategies have developed in isolation and rest almost entirely on small, perception-based samples. To complement that literature, we provide a quantitative account of firms' observed sourcing behavior that examines the three complementary de-risking strategies—decoupling, diversification, and friendshoring—together and across different types of disruption. We now turn our attention to the concept of de-risking and its underlying location portfolio reconfiguration strategies.

2.2. De-risking

De-risking has been considered in the OSCM literature from two perspectives. The first is a broad, firm-level perspective that encompasses areas such as R&D, data localization, and products and services (Day et al., 2025). The second is a narrower perspective focused on procurement and the sourcing location portfolio (Free et al., 2026; Schleper et al., 2024). As noted in the introduction, we adopt the sourcing perspective. However, we depart from the view that de-risking simply means diversifying the supply base while decoupling means severing ties with particular countries (Free et al., 2026; Schleper et al., 2024). Instead, we categorize decoupling as a component of de-risking and argue in this section that

decoupling operates more as a continuum than a binary break, and that de-risking extends beyond diversification. Interestingly, the term de-risking emerged as politicians came to regard decoupling as too controversial.

"*I believe it is neither viable – nor in Europe's interest – to decouple from China. Our relations are not black or white – and our response cannot be either. This is why we need to focus on de-risk – not de-couple.*"

— Ursula von der Leyen, President of the European Commission (March 29th, 2023)

In her speech on EU-China relations, von der Leyen outlined four pillars supporting the European de-risking strategy. She urged European industry not only to become more competitive and resilient by reducing dependence on China for key inputs (i.e., the decoupling component) but also to diversify its sources of supply. She also advocated better use of existing trade instruments and the creation of new tools to prevent the transfer of capital and knowledge that could be used against European interests. Finally, she called for alignment with other countries that share the same economic-security concerns. In a May 2023 communiqué, G7 leaders expressed similar de-risking intentions through the same levers (European Council, 2023). Drawing on these political agendas, we conceptualize de-risking, from a sourcing perspective, as three implementable sourcing location strategies: reducing exposure to a focal sourcing location (decoupling), dispersing the sourcing portfolio (diversification), and adjusting its political alignment (friendshoring).

These three strategies mirror the sequence of the recent crises, the political calls they prompted, and the strategy-specific literatures they generated. Decoupling was observed during the 2018 US-China trade war (e.g., Fan et al., 2024), diversification during the COVID-19 pandemic (e.g., Niu et al., 2025), and friendshoring after Russia's invasion of Ukraine (e.g., Klarin & Sosnovskikh, 2025). Studies of decoupling have begun to consider a second strategy jointly, since decoupling usually requires sourcing from new locations, pairing it with diversification (Free et al., 2026) or with friendshoring (Lei et al., 2026). We extend this line of work to three strategies for two reasons. The first is to integrate into OSCM the political discourse presented above, which brings the three strategies together into a single de-risking agenda for sourcing location portfolios. The second is the complementarity that ties them together. Decoupling responds to two primary

sources of location risk, tensions with the sourcing partner and overdependence on it. Yet, a portfolio that has reduced its exposure to one risky origin is not necessarily less concentrated or better aligned politically. Diversification and friendshoring govern the dispersion and the political alignment of the portfolio, whereas decoupling acts on the weight of the focal source. Each strategy therefore addresses a distinct source of risk, and a firm may pursue any of them without the others. To our knowledge, only Cichanowicz et al. (2026) have likewise drawn on this political discourse to gather the three strategies under the de-risking term, in a study of Japanese overseas investment. We now briefly review what each strategy entails for de-risking.

First, decoupling allows companies to quickly shift sourcing volume away from a location exposed to a sudden disruption. The literature diverges on whether decoupling represents a binary break or a continuum. At the country level, it has been defined as a "complete separation of ties between two or more economies" (Capri, 2023), a binary view that Witt et al. (2023) reject in favor of a continuum of reduced interdependence, treating decoupling as a process rather than an outcome. At the firm level, it is likewise associated with a drastic, binary severance of ties (Free et al., 2026; Schleper et al., 2024). Yet others treat decoupling as continuous. Evenett and Pisani (2023) measure it through foreign companies' equity divestment in Russia, while other scholars show firms navigating geopolitical fragmentation without fully severing ties with major powers (Cui et al., 2023; Liu et al., 2025). Complete decoupling, whether at the country or firm level, remains rare relative to partial reductions in exposure. We therefore define decoupling as *the process of reducing a firm's supply chain exposure to a market*, encapsulating both partial and complete scenarios.

Second, diversification consists of spreading sourcing across a larger and more balanced set of locations so that no single source is pivotal. In the OSCM literature, diversification is the classic counterpart to single sourcing and typically assesses whether a firm concentrates its sourcing on a few large suppliers or spreads it across many (e.g., Lin et al., 2021; Wang et al., 2024). The rationale behind diversification is to enhance supply-network flexibility by having multiple sourcing locations to provide backup capacity when any single source fails (Cohen & Lee, 2020). From a global sourcing

perspective, diversification refers to sourcing across multiple countries (e.g., Charpin & Cousineau, 2025; Free et al., 2026).

Third, friendshoring involves selecting sourcing locations that are politically aligned with the firm's home country to mitigate the risk of supply disruptions. The notion of alignment remains loosely defined, amounting to an intention to source from like-minded partners that share values and strategic interests (Vivoda & Matthews, 2024). However, Klarin & Sosnovskikh (2025) note that framing of friendshoring is almost exclusively Western-centric, prioritizing the interests of US or European actors, largely in response to China's expanding strategic influence. The underlying goal is to reduce dependencies on countries that could weaponize supply chains to gain leverage during a geopolitical conflict (Witt et al., 2023). The influence of political alignment on cross-border activities has been documented in the relocation of supply bases (Charpin & Cousineau, 2025), mergers and acquisitions (Yoon et al., 2021), patent-filing trends (Zhou et al., 2024), and international research collaborations (Charpin et al., 2024).

3. Hypotheses development

We now link each de-risking strategy to the type of geopolitical disruption most likely to trigger it first, as illustrated in Figure 1.

Insert Figure 1 here

We distinguish three types of disruption, each represented by one of the shocks we study. Bilateral shocks directly pit a firm's home country against an adversary (the 2018 US–China trade war); systemic shocks disrupt many locations at once (the COVID-19 pandemic); and alliance-based shocks force countries to take sides in a conflict between other powers (the Russia–Ukraine war). These shocks differ not only in their scope but also in how they affect sourcing location portfolios. A bilateral shock alters the risk of one home–host relationship, so the exposure is concentrated in a single identifiable country and can be addressed by reducing sourcing from it. A systemic shock strikes locations indiscriminately, so concentration itself becomes the exposure. An alliance-based shock alters the risk of every origin at once, since the risk attached to each depends on its political

alignment with the competing blocs, and can therefore only be addressed by reconfiguring the composition of the full portfolio. Rather than predicting how each strategy would unfold in every period, we hypothesize that each of the three strategies is used during the crisis for which firm-level logic and real-world political developments make it best suited. Because firms may pursue several strategies at once, our hypotheses concern which strategy is most closely associated with each shock, not which is used to the exclusion of the others. We then examine the evolution and significance of all three strategies across all crises in our findings. It is also widely documented that firms' location portfolio reconfiguration depends on their level of exposure to the focal sourcing location (e.g., Fan et al., 2024; Hsu et al., 2026; Luo & Wang, 2025), as more-exposed firms suffer larger performance losses from disruptions there (e.g., Fan et al., 2022; Huang et al., 2023). We therefore account for each firm's level of exposure to China sourcing in all our hypotheses.

Decoupling reflects a firm's effort to reduce its exposure to a sourcing location which it deems risky. We posit that decoupling is especially suited to bilateral shocks, which concentrate the risk in one identifiable source. When the threat is country-specific, the most intuitive response for firms is to cut exposure to that country. Decoupling from China was popularized by the Trump administration in 2017 and gained initial momentum during the onset of the US–China trade war in 2018. The US government's desire to decouple from China led to the implementation of discriminatory trade practices (Charpin, 2022). Firms sourcing from an adversarial location are thus directly exposed to disruptions such as sudden cost increases from tariffs (Fan et al., 2022) or supply shortages caused by export bans (Jacobs et al., 2022). Decoupling allows these firms to reduce their exposure to the targeted market and mitigate the impact of the disruption. For instance, US firms exposed to the 2018 US–China trade war reduced their supply base in China (Fan et al., 2024). We therefore expect that, when a bilateral shock directly targets a sourcing location, highly exposed firms decouple from it.

> H1: US firms highly exposed to China decouple from it during the 2018 US–China trade war (a bilateral shock).

Diversification allows firms to reduce their exposure to a single location within their supply networks. While extending the supply base to diverse locations and avoiding excessive

concentration on a few sources can effectively reduce the impact of a disruption (Lin et al., 2021; Wang et al., 2024), this resilience comes at a cost. The tradeoff is that a more diversified supply base is also more costly to coordinate in terms of contracting (Choi & Krause, 2006) and decision-making (Phadnis & Joglekar, 2021). These challenges are magnified when sourcing locations are spread across many countries as firms must devote additional resources to learning unfamiliar regulatory environments (Dong et al., 2020). Against this backdrop, we contend that diversification is best suited to address systemic shocks, which strike many locations at once and expose the danger of concentration itself rather than of any single source. The firm's most effective response is to increase the dispersion of its sourcing portfolio since it cannot predict which node may fail. The COVID-19 pandemic is the archetypal systemic shock because it affected all industries simultaneously, spilled across regions, and produced concurrent supply and demand shifts (Craighead et al., 2020). Beyond its systemic reach, the pandemic also carried a geopolitical dimension, as states turned to protectionist measures that fueled trade tensions (Bednarski et al., 2025; Charpin, 2022). Following the shortages of essential goods during the COVID-19 pandemic, many nations launched initiatives to reduce their sourcing concentration by diversifying their supply chains (e.g., US Department of Health and Human Services, 2024). Firms responded to the COVID-19 pandemic by rebalancing volume across their existing sourcing locations (Niu et al., 2025) and reconsidering their concentration on China (van Hoek & Dobrzykowski, 2021). We therefore expect that, among highly exposed firms, diversification is the de-risking response most closely associated with a systemic shock.

> H2: US firms highly exposed to China diversify their sourcing during the COVID-19 pandemic (a systemic shock).

Friendshoring aims to increase sourcing from politically aligned partners while reducing exposure to countries deemed untrustworthy. We assert that it is best suited to alliance-based shocks, which sort countries by their alignment with the prevailing international order. Since the end of the Cold War, that order has been marked by a divide between a US-led liberal bloc and a fragmented group of nations that do not fully share its values (Bailey et al., 2017). Accordingly, the term was popularized by US Treasury Secretary Janet

Yellen shortly after the 2022 Russian invasion of Ukraine, when she urged firms to move their supply chains toward a broad group of trusted countries that share common values. She also warned that nations sitting on the fence would not be spared, and singled out China for its special relationship with Russia (US Department of the Treasury, 2022). Unlike a bilateral shock, which makes a specific dyadic relationship risky (e.g., sourcing from China for US firms), an alliance-based shock redefines the riskiness of all sourcing locations according to their political alignment with competing blocs. Consequently, risk is no longer tied to dependence on a single country but to the political composition of the full sourcing portfolio. For example, following Russia's invasion of Ukraine, sourcing locations that refrained from condemning the invasion or maintained close ties with Russia became potentially more exposed even when they had not previously been the target of bilateral tensions with the US. When a conflict forces countries to take sides, the relevant hedge is to shift sourcing toward partners aligned with the home country, as sourcing from the opposing camp becomes a source of risk through sanctions and reputational exposure. Friendshoring therefore operates on the political composition of the portfolio as a whole rather than on the weight of any single source. We therefore expect that, when an alliance-based shock polarizes sourcing locations by political alignment, highly exposed firms increase the alignment of their sourcing portfolios.

> H3: US firms highly exposed to China friendshore their sourcing during the Russia–Ukraine war (an alliance-based shock).

While the multiplicity of global disruptions has pushed the de-risking narrative to the forefront of location-portfolio strategies, the high-tech sector has received particular attention. Technology not only plays a critical role in a country's economic development (Edgerton, 2007) but also carries direct implications for its national security (Zhang, 2023). Accordingly, geopolitical rivalry has increasingly played out in the technological sphere, as each power seeks to impose its own technological standards while restricting rivals' access to critical technologies they might use opportunistically (Luo, 2022). At the policy level, the 2022 US CHIPS and Science Act bars firms that receive US federal funding from expanding advanced semiconductor production in China and other restricted nations for a decade (Luo & Van Assche, 2023). The policy signals an intent not only to advance US

technological development but also to slow China's. At the firm level, this intent materialized in restrictions on US technology exports to Chinese high-tech firms such as ZTE (Jacobs et al., 2022) and Huawei (Tse et al., 2024), with the supply disruptions that followed.

Zhang (2023) contends that contemporary decoupling is driven by national-security concerns concentrated in high-tech industries rather than amounting to a complete decoupling of the global economy. Because high-tech firms are the prime targets of these techno-nationalist measures, we posit that they face greater geopolitical exposure and therefore a stronger incentive to de-risk their supply base. Consistent with this logic, the negative effect of geopolitical tensions on international research collaborations is more pronounced for high-tech firms (Charpin et al., 2024) and firms in industries exposed to geopolitical rivalry, such as semiconductors, are under strong pressure to adopt de-risking strategies (Bednarski et al., 2026). We therefore expect that, among highly exposed firms, those operating in high-tech industries de-risk their sourcing more aggressively.

> H4: Among US firms highly exposed to China, the de-risking response is stronger for those operating in high-tech industries.

4. METHODS

4.1 Data and sample

We build our sample panel dataset from the Panjiva database (S&P Global), which compiles US seaborne import records from bills of lading. This database has been used in the OSCM literature to examine how firms reconfigure their supply chains in response to disruptions and policy shifts, such as trade-policy uncertainty (Charoenwong et al., 2023), the COVID-19 pandemic (Niu et al., 2025), and regional value-content requirements (Hsu et al., 2026). For US publicly traded firms that imported from China at least once between 2011 and 2024, we extract the importer of record, the shipment's country of origin, and its volume in twenty-foot equivalent units (TEUs). Using TEU volumes winsorized at the 1st and 99th percentiles, we aggregate these transactions to the firm-country-year level to reconstruct, for each firm, the annual composition of its imports across countries of origin. We then link firms to Compustat through their identifiers to obtain financial fundamentals.

Because the Panjiva US import dataset captures only seaborne transactions, it excludes overland trade with Mexico and Canada. We partially address this by appending Mexican non-air exports to the US from the Panjiva Mexico export dataset, after removing Mexican records from the US import file to avoid double-counting (Hsu et al., 2026). Unlike for Mexico, the Panjiva database does not provide Canadian export records, so the same correction is not possible for overland imports from Canada. Following the OSCM literature (e.g., Jain & Wu, 2023; Leung & Sun, 2021), we exclude financial firms (SIC codes 6000–6999), whose accounting characteristics (e.g., the leverage measure included as a control) are not directly comparable to those of non-financial firms (Fama & French, 1992). Our final sample comprises 1,565 US publicly traded firms observed over 2011–2024, for a total of 15,457 firm-year observations. Our sample period starts in 2011 as it is the earliest year for which Panjiva Mexican export data are available.

4.2 Measures of de-risking strategies

We operationalize the three de-risking strategies as firm-year properties of the sourcing location portfolio. *Decoupling* captures the firm's effort to reduce its sourcing exposure to China. As no established measure captures the decoupling process, we construct our own. We first smooth the firm's China import share using a trailing three-year moving average to attenuate the lumpiness of individual shipments. *Decoupling* is then measured as the negative of the year-over-year change in this smoothed share, such that higher values indicate a larger reduction in China exposure. Decoupling as a year-over-year change is consistent with the process view of decoupling (Witt et al., 2023) and with its continuous measurement in Evenett and Pisani (2023). Diversification captures the dispersion of the firm's sourcing portfolio across countries, which we measure in two complementary ways. Following prior work that measures diversification with the Herfindahl-Hirschman Index (HHI) (e.g., Lin et al., 2021; Wang et al., 2024), we calculate *Diversification (share)* as one minus the HHI of the firm's import shares by country. This measure captures how evenly volume is distributed across its sourcing countries; higher values denote a less concentrated portfolio. *Diversification (count)* is the number of distinct countries from which the firm sources in a given year, capturing the breadth of its sourcing base (Niu et al., 2025). The two measures are complementary because a firm can diversify by spreading volume more

evenly across its existing sources or by sourcing from a larger number of countries. We build on Charpin and Cousineau (2025) to construct *Friendshoring*, which captures the political alignment of the firm's sourcing portfolio with the US. We measure each origin country's alignment using the ideal-point distance derived from United Nations General Assembly voting (Bailey et al., 2017). We then compute *Friendshoring* as the negative of the volume-weighted average ideal-point distance across the firm's origin countries, so that higher values indicate a portfolio sourced from more politically aligned countries. Importantly, the measure does not rest on a fixed, researcher-defined list of "friendly" countries. Every origin country with an observed alignment score enters the computation, so the measure varies across firms, with the composition of each sourcing portfolio, and over time, with countries' actual voting behavior.

Because sourcing shares sum to one, reducing the weight of China mechanically raises the weight of every other origin, so decoupling has direct effects on measured diversification and friendshoring. Decoupling is nonetheless no guarantee that the portfolio becomes more diversified or more politically aligned. A firm may reallocate the released volume to an origin that already accounts for a large share of its sourcing, increasing concentration, or to one that is politically more distant than China, reducing political alignment. Conversely, an improvement in full-portfolio diversification or political alignment need not indicate genuine de-risking. A firm cutting China and reallocating towards an origin it already uses, an origin politically closer than China but more distant than its other sources, ends up with a non-China portfolio that is both more concentrated and less aligned. The improvement recorded by the full measures then reflects only the smaller China share. We therefore additionally compute *Diversification (share non-CHN)* and *Friendshoring (non-CHN)* over the firm's non-China imports alone. These measures break this mechanical link, revealing whether diversification and political alignment were pursued beyond the decoupling move itself.

4.3 Measure of China exposure

De-risking is most consequential for firms with substantial prior reliance on China (e.g., Fan et al., 2024; Hsu et al., 2026; Luo & Wang, 2025). Indeed, firms with little Chinese sourcing have relatively little exposure to reduce when sourcing from China becomes

riskier. Therefore, we interact the disruption periods with each firm's pre-disruption exposure to China. We define *ChinaExposure* as the firm's average China import share over the 2015–2017 window, immediately preceding the disruptions we study. Consistent with the trade-war literature, firms' exposure is measured through their pre-trade war China sourcing (e.g., Fan et al., 2022; Huang et al., 2023). Additionally, measuring exposure over a fixed pre-disruption window, rather than contemporaneously, ensures that the moderator is not itself affected by the de-risking behavior we seek to explain, thereby limiting concerns about reverse causality.

4.4 High-tech classification

To test whether the de-risking response is stronger in technology-intensive sectors, we create *HighTech*, a binary indicator equal to 1 for firms in high-tech industries and 0 otherwise. Following the industry classification originally developed by Cloodt et al. (2006) and subsequently adopted in several studies (e.g., Charpin et al., 2024; McCarthy & Aalbers, 2022), we classify pharmaceuticals (SIC 283), computers (357), electronics and communications (36), and aerospace and defense (372 and 376) as high-tech industries.

4.5 Control variables

We control for firm characteristics that may shape global sourcing decisions, retrieved from Compustat. We include firm size (the natural logarithm of total assets) and profitability (return on assets), as larger and more profitable firms tend to operate more globalized and complex supply bases (Shu & Fan, 2024). We also control leverage (total long-term debt divided by total assets) as financial health can influence a firm's globalization degree (Dong et al., 2022).

4.6 Model specifications

The three disruptions are examined within a single design because each was followed by a distinct political call: decoupling during the 2018 trade war, diversification during the COVID-19 pandemic, friendshoring after the invasion of Ukraine. Because our research question requires establishing which strategy is tied to which type of shock, the three disruptions must be studied jointly. Each period is therefore measured against a common baseline (2011–2017), which covers the entire period preceding the first disruption and

makes the three coefficients directly comparable. Furthermore, the disruptions arrived as an unbroken sequence, leaving no quiet interval that could serve as a disruption-specific baseline. Our specification addresses three potential sources of endogeneity. To mitigate omitted variable bias, we saturate the model with firm fixed effects, year fixed effects, and industry-specific linear trends, absorbing time-invariant firm heterogeneity, economy-wide shocks, and distinct sectoral trajectories. To limit reverse causality, we measure *ChinaExposure* over a fixed pre-disruption window (2015–2017), as explained in Section 4.3, while the disruption periods themselves are global events that no individual firm can influence. Finally, to reduce simultaneity, we lag all control variables by one year so that the firm characteristics and the sourcing outcomes are not jointly determined within the same period.

To test Hypotheses 1–3, we estimate the following interaction model:

$$Y_{i,t} = \beta_0 + \beta_k(Period_{k,t} \times ChinaExposure_i) + \alpha_i + \lambda_t + \delta_j t + \gamma\, Controls_{i,t-1} + \epsilon_{i,t}$$

where $Y_{i,t}$ is one of the three de-risking measures for firm *i* in year *t*; $Period_{k,t}$ are the US–China trade war (2018–2019), the COVID-19 pandemic (2020–2021), and the Russia–Ukraine war (2022–2024) indicators. $ChinaExposure_i$ is the firm's pre-disruption China sourcing exposure. α_i, λ_t are respectively the firm and year fixed effects, $\delta_j t$ the industry-specific linear trends, $Controls_{i,t-1}$ the vector of lagged controls, and $\epsilon_{i,t}$ the error term. The main effect of *ChinaExposure* is absorbed by the firm fixed effects because it is time-invariant. Likewise, because the period indicators are constant within years, they are collinear with the year fixed effects, so their main effects are absorbed and omitted from the estimation. Identification comes instead from the interactions between these period indicators and *ChinaExposure*, which vary across firms within each year. Each β_k measures how the de-risking response of more-exposed firms during disruption *k* differs from the pre-disruption baseline. This interaction is both the theoretical and the empirical object of interest. De-risking is a response to exposure because firms with limited sourcing from China are less affected by each of the three disruptions. The key question is therefore whether firms reacted differently depending on their level of China exposure. Moreover, because the year fixed effects absorb all shocks common to firms in a given year, the interaction term specifically identifies that differential response.

To test H4, we estimate a triple-interaction model, which adds the high-tech indicator:

$$Y_{i,t} = \beta_0 + \beta_k(Period_{k,t} \times ChinaExposure_i) + \theta_k(Period_{k,t} \times HighTech_i) + \pi_k\,(Period_{k,t} \times ChinaExposure_i\ x\ HighTech_i) + \alpha_i + \lambda_t + \delta_j t + \gamma\, Controls_{i,t-1} + \epsilon_{i,t}$$

The coefficients of interest, π_k, capture whether the de-risking response of more-exposed firms during disruption *k* is amplified among high-tech firms, as H4 predicts.

Standard errors are clustered at the firm level, and all models are estimated in Stata version SE 19.5 using the *reghdfe* package (Correia, 2017), which efficiently absorbs multiple high-dimensional fixed effects. The same specifications estimated with *xtreg* produce identical coefficient estimates and statistical inferences. We nevertheless use *reghdfe* because it readily accommodates the multiple fixed effects and industry-specific trends included in our specifications. All continuous dependent variables and firm-level controls are winsorized at the 1st and 99th percentiles. Detailed de-risking variable definitions and mathematical formulas are provided in Appendix 1, while Table I presents descriptive statistics for the variables included in our models.

Insert Table I here
---

5. Results

5.1 Main results

We present our main empirical results in Table II. Because the dependent variables and *ChinaExposure* are standardized, each interaction coefficient indicates how many standard deviations the outcome changes during a given disruption when *ChinaExposure* is one standard deviation higher. For example, in column 1, the coefficient on *Trade war* × *ChinaExposure* ($\beta = 0.384$, $p < 0.01$) indicates that a one-standard-deviation increase in *ChinaExposure* is associated with an increase in *Decoupling* equal to 38.4% of its standard deviation during the trade-war period.

Column 1 shows that the effect of *ChinaExposure* on *Decoupling* is positive and statistically significant at the 1% level during the trade-war period ($\beta = 0.384$, $p < 0.01$), supporting Hypothesis 1. Firms highly exposed to China reduce that exposure following a bilateral shock. The effect is also positive and significant during the COVID-19 pandemic ($\beta = 0.451$, $p < 0.01$) and the Russia–Ukraine war ($\beta = 0.331$, $p < 0.01$). Turning to diversification, column 2 indicates that the effect of *ChinaExposure* on *Diversification (share)* is positive and significant during the COVID-19 pandemic ($\beta = 0.082$, $p < 0.01$) and the Russia–Ukraine war ($\beta = 0.109$, $p < 0.01$), but not during the trade war. However, when China is excluded from the *Diversification (share)* measure (column 3), and for the number of sourcing countries (column 4), *ChinaExposure* has no statistically significant effect in any period. Support for Hypothesis 2 is thus conditional on the form of diversification considered, namely the even spread of sourcing shares (column 2) versus the number of sourcing countries (column 4), as well as on whether it is measured over the full portfolio (column 2) or only the non-China destinations (column 3). With respect to *Friendshoring*, column 5 shows a positive and significant effect during the COVID-19 period ($\beta = 0.069$, $p < 0.01$) but no significant effect during the Russia–Ukraine war; Hypothesis 3 is therefore not supported. Column 6 further indicates that the effect of *ChinaExposure* on *Friendshoring* excluding China is negative and significant during the Russia–Ukraine war ($\beta = -0.083$, $p < 0.01$)—the opposite of our expectation—providing further evidence against Hypothesis 3.

Insert Table II here

We next examine whether these effects are moderated by membership in high-tech industries. Table III reports the triple interactions between period, China exposure, and the high-tech indicator. The moderating effect of *HighTech* is statistically significant in only one instance: *Friendshoring (non-CHN)* during the trade-war period ($\beta = 0.123$, $p < 0.05$, column 6). The two de-risking responses that our main analysis identifies are not amplified among high-tech firms. Neither decoupling nor the diversification of sourcing shares shows a significant high-tech interaction in any period (columns 1 and 2). The one significant interaction, moreover, falls at the bilateral shock rather than at the alliance-based one where

we expected the friendshoring response. Overall, there is little evidence that high-tech firms de-risk more aggressively than other firms; hence Hypothesis 4 is not supported.

Insert Table III here

5.2 Post-hoc analyses

5.2.1. De-risking strategy transitions. In Table II, each coefficient is estimated relative to the common 2011–2017 pre-disruption baseline. Consequently, a strategy can appear significant in a later period either because firms newly adopted or intensified it during that period, or because an effect that began during an earlier disruption simply persisted. To distinguish these cases and better establish when each strategy is actually adopted, we extend our analysis to period-to-period transitions. We estimate the linear contrasts of the Table II interactions so that each coefficient captures the change in the *ChinaExposure* effect from one disruption to the next, rather than relative to the pre-disruption baseline. Table IV presents this transition specification, which isolates the period in which a strategy is switched on, intensified, or reduced.

Insert Table IV here

Decoupling (column 1) rises sharply at the onset of the trade war ($\Delta\beta = 0.384$, $p < 0.01$), by far the largest transition in the table, modestly intensifies during the COVID-19 pandemic ($\Delta\beta = 0.067$, $p < 0.05$), and then partially decelerates during the Russia–Ukraine war ($\Delta\beta = -0.120$, $p < 0.01$) while remaining well above its pre-disruption level. Consistent with Hypothesis 1, decoupling is the only strategy that activates at the trade war, and it does so more strongly than at any later disruption.

Diversification (share) (column 2) is flat at the trade war but increases significantly at the COVID-19 transition ($\Delta\beta = 0.074$, $p < 0.01$) and holds at that elevated level thereafter, as the Russia–Ukraine transition is not significant. *Diversification (share, non-CHN)* (column 3) and *Diversification (count)* (column 4) show no transition significant at the 5% level in any period. Consistent with Hypothesis 2, the diversification of sourcing

shares switches on specifically at the COVID-19 pandemic and does not increase thereafter. However, this pattern holds for neither the non-China share of the portfolio nor the number of sourcing countries.

Friendshoring (column 5) increases at the COVID-19 pandemic ($\Delta\beta = 0.046$, $p < 0.01$) but then declines significantly at the Russia–Ukraine war ($\Delta\beta = -0.093$, $p < 0.01$), indicating that more-exposed firms became less politically aligned in their sourcing once the war began. The non-China friendshoring measure (column 6) moves in the opposite direction at the COVID-19 transition ($\Delta\beta = -0.049$, $p < 0.05$). Hypothesis 3 predicted an increase in *Friendshoring* during the Russia–Ukraine war, yet we find the opposite: the friendshoring effect peaks during COVID-19 and reverses significantly at the onset of the war, while the pandemic gain does not extend to the non-China portfolio.

In sum, the de-risking pattern displays evidence of a strategy–shock fit for *Decoupling* during a bilateral shock (2018 US–China trade war) and for *Diversification (share)* during a systemic shock (COVID-19 pandemic), but not for *Friendshoring* during an alliance-based shock (Russia–Ukraine war).

5.2.2. The semiconductor industry. Semiconductors have recently been at the center of geopolitical tensions between the United States and China (Bednarski et al., 2026; Witt et al., 2023; Zhang, 2023), making the industry a particularly relevant setting in which to examine firms' de-risking responses. We therefore re-estimate our models, replacing the high-tech moderator with an indicator for firms operating within the semiconductor and semiconductor equipment industries. The variable *Semiconductor* takes the value 1 for firms in the Semiconductors & Semiconductor Equipment industry group (GICS 453010) and the value 0 otherwise. Table V reports the triple interactions between period, China exposure, and the semiconductor indicator. The moderating effect of *Semiconductor* is concentrated in the Russia–Ukraine war period. Specifically, the effect is negative and statistically significant at the 5% level for the diversification of sourcing shares, both including ($\beta = -0.24$, $p < 0.05$, column 2) and excluding China ($\beta = -0.212$, $p < 0.05$, column 3). The triple interactions are not statistically significant at the 5% level during the trade-war and COVID-19 periods, nor for the remaining outcomes.

Insert Table V here

Therefore, although the semiconductor industry has been at the forefront of geopolitical rivalry, especially since the enactment of the 2022 US CHIPS and Science Act (Luo and Van Assche, 2023), we find no evidence of de-risking among highly exposed US semiconductor firms. On the contrary, those most exposed to China reduced the diversification of their sourcing shares following the onset of the Russia–Ukraine war.

5.3 Robustness checks

We conduct a series of additional tests to assess the robustness of our findings. First, we add stringent fixed effects to control for annual shocks occurring in each industry. Our main specification controls for sectoral trajectories through industry-specific linear trends. As a first robustness check, we replace these trends with industry-by-year fixed effects, thereby absorbing any time-varying shock common to firms within the same industry in a given year. The logic of this test is to further reduce omitted variable bias by ensuring that our results are not driven by unobserved shocks that affect entire industries simultaneously, which fixed effects absorb consistently (Gormley & Matsa, 2014). Appendices 2 and 3 re-estimate the main results under this specification. Our results remain qualitatively similar, with the magnitude and significance of the key coefficients essentially unchanged.

As a second set of robustness checks, we verify that our central finding on decoupling is not an artifact of the particular way in which we operationalize firms' de-risking response. We re-estimate the models using two alternative measures. An annual (un-smoothed) decoupling measure captures the raw year-over-year change in reliance on China without temporal smoothing. A strict substitution measure captures only the explicit reallocation of sourcing volume away from China toward the rest of the world. The logic of these tests is to confirm that the decoupling effect documented in our main results holds under alternative operationalizations of the dependent variable, so that the result reflects the underlying behavior rather than a specific measurement convention (Boyd et al., 2005). Appendix 4 shows that across both alternative measures, and under both the industry-trends and the industry-by-year fixed-effects specifications, the effect of *ChinaExposure* remains

positive and statistically significant at the 1% level in all three periods, confirming the stability of our main decoupling result.

Third, a common baseline period makes the coefficients comparable across the three disruptions. However, because the benchmark is fixed, the coefficients for the later disruptions are measured against an increasingly distant reference and cumulate de-risking strategies that began during the earlier ones. Since the reference period is an identification restriction that must be imposed rather than a neutral convention (Borusyak et al., 2024), we examine two alternatives. The first is the sequential transition analysis reported in Section 5.2.1, which compares each disruption with the one immediately before it. Because it restates the same estimates relative to the preceding period rather than fitting a new model (Schmidheiny and Siegloch, 2023), it displays the strategy-specific pattern without relying on the distant benchmark. However, it compares each disruption only with the one directly preceding it. Therefore, as a second robustness check, we estimate an expanding-baseline version in which each disruption is compared with all the years preceding it. The goal is to absorb earlier responses into the reference period to isolate the increment attributable to the disruption itself. Appendices 5 and 6 show that all conclusions hold, with the addition that *Friendshoring*, not significant during the Russia–Ukraine war under the common baseline, turns negative (Appendix 5, Panel B, column 5) once the reference includes the COVID-19 pandemic period ($\beta = -0.05$, $p < 0.05$). Indeed, because political alignment had risen during the pandemic, the war period is measured against a higher benchmark. This is consistent with the transition analysis and reinforces our conclusion that exposed firms did not friendshore during the Russia-Ukraine war.

Last, the number of sourcing origins is a count and the diversification share is bounded between zero and one, so linear estimation could in principle distort either. We therefore re-estimate the count models by Poisson pseudo-maximum likelihood (Santos Silva & Tenreyro, 2006) and the share models by fractional regression (Papke & Wooldridge, 1996), using *ppmlhdfe* (Correia et al., 2020), which absorbs multiple sets of fixed effects within a Poisson framework. The effect of *ChinaExposure* on *Diversification (share)* remains positive and significant during the pandemic ($\beta = 0.085$, $p < 0.01$) and the Russia-Ukraine war ($\beta = 0.11$, $p < 0.01$), while its effect on *Diversification (count)* and the non-China share remains null in all three periods. Finally, no high-tech interaction is significant

in any period for either *Diversification (count)* or *Diversification (share)*, consistent with our baseline results.

6. Discussion

Our study contributes to the de-risking discourse in OSCM at a time when supply chain crises show no sign of abating and call for greater resilience. We now outline our theoretical contributions and the practical and policymaking implications of our findings.

6.1. Theoretical contributions

First, we contribute to the OSCM location-strategy literature by theorizing the de-risking of a sourcing portfolio as a combination of three location strategies: decoupling, diversification, and friendshoring. Positioning these three strategies as subsets of de-risking brings conceptual clarity to a discourse in which decoupling and de-risking are frequently conflated (Capri, 2023) or in which de-risking is viewed only through a diversification lens (Free et al., 2026; Schleper et al., 2024). This typology also clarifies the levers firms can weigh when reconfiguring their sourcing location portfolio under heightened uncertainty, an increasingly important feature of location decisions (Cohen et al., 2018; Cohen & Kouvelis, 2021; Schleper et al., 2024). Critically, our results show that the three strategies are empirically separable. Following the Russia–Ukraine war, highly exposed firms continued to decouple, and their portfolios remained more diversified, yet friendshoring did not materialize. Had friendshoring been the joint product of decoupling and diversification (Cichanowicz et al., 2026), it should have emerged precisely under these conditions. We therefore posit that the three location strategies should be treated as independent choices. Additionally, by operationalizing decoupling as a process rather than an outcome, as suggested by Witt et al. (2023), we reframe it as a portfolio-level adjustment rather than a binary severance of ties. Our measures can help researchers move beyond exit strategies (e.g., Patel & Richter, 2025; Srai et al., 2023) to capture firms' desire to reduce supply chain exposure to markets that are becoming increasingly risky, or on which they have become overdependent.

Second, we contribute to the supply-network literature (e.g., Cohen & Lee, 2020) by revealing a key measurement nuance when decomposing the diversification and

friendshoring measures into full-portfolio and non-China versions. The full-portfolio versions describe the diversification and political alignment of a firm's entire sourcing base, China included. The non-China versions describe the same two properties of everything the firm sources outside China. The distinction is critical because sourcing shares sum to one, so reducing the weight of one origin changes every other share. The full-portfolio versions therefore incorporate the decoupling move itself and can improve simply because a large or politically distant origin now weighs less, with no intent to reorganize the rest of the base. The non-China versions exclude those mechanics and capture the diversification and political alignment that go beyond the decoupling move, which is consistent with a deliberate attempt to de-risk the remaining portfolio. Comparing the two therefore separates a mechanical improvement from a genuine reconfiguration of the rest of the base.

Our results highlight the value of this decomposition in two ways. Full-portfolio diversification rises during the pandemic and the Russia-Ukraine war, and full-portfolio political alignment rises during the pandemic, yet none of these gains appears in the non-China versions. The improvements therefore reflect the shrinking China share rather than a broader effort to spread or realign the rest of the base. The full-portfolio measure can also conceal a decline in the non-China portfolio. During the Russia-Ukraine war, the full-portfolio measure records no change in political alignment, even though the non-China version becomes less politically aligned. This apparent stability suggests that the gains associated with a shrinking China share offset a decline in the political alignment of the non-China portfolio. This finding is important because, as firms decouple from a focal location, the remaining portfolio accounts for an increasing share of sourcing. Consequently, a deterioration in the remaining portfolio may expose firms to increasing risk despite ongoing decoupling. Our decomposition thus reveals a subtle yet consequential risk of misinterpretation in de-risking research. Portfolio-wide measures of diversification and political alignment are mechanically tied to decoupling, even though the three strategies are independent choices. Studies assessing de-risking on the full portfolio alone may conclude that firms have diversified or realigned when they have merely decoupled, or may record no movement at all when a decoupling gain conceals a genuine deterioration in the rest of the base.

Third, we contribute to the literature on geopolitical disruptions and supply chain reconfiguration by examining three location strategies and three types of geopolitical disruptions concurrently. We find tentative evidence that decoupling is most associated with bilateral shocks and the spreading of sourcing flows with systemic shocks, whereas we find no clear evidence that friendshoring is used during alliance-based shocks. Although the match between strategies and disruption types is imperfect, our findings lay the groundwork for a contingency theory of strategy–shock fit in supply chain management. Importantly, although our study draws on the 2018 US–China trade war, the COVID-19 pandemic, and the Russia–Ukraine war, bilateral, systemic, and alliance-based shocks are not limited to these events. A trade war, for instance, could be systemic rather than bilateral (e.g., the 2025 "Trump 2.0" trade war), and a military conflict could be bilateral rather than alliance-based (e.g., the 2024 Afghanistan–Pakistan conflict). A non-military issue, such as the fight against climate change, could likewise be alliance-based. Theoretically, the de-risking response may be shaped more by the type of shock than by the specific event. Prior literature has focused on firms' idiosyncratic responses to particular events (e.g., Moradlou et al., 2025; Ren et al., 2024; Roscoe et al., 2022; van Hoek & Dobrzykowski, 2021). Our study instead moves the analysis of location-portfolio reconfiguration from perception-based accounts to observed sourcing behavior, revealing large-scale patterns that link shock types to mitigation strategies.

6.2. Practical implications

For managers, our findings caution against reading portfolio-wide resilience metrics at face value. Cutting a focal location may mechanically improve a sourcing portfolio's apparent diversification and political alignment. Aggregate indices can therefore signal de-risking that has not genuinely occurred in the rest of the base. Managers should assess de-risking there as well because that is where the next disruption may land. A recent example illustrates the cost of ignoring the political alignment of the new destination. To reduce their China exposure amid growing tensions, many US firms relocated sourcing to India. Yet India was not aligned with the US on the Russia–Ukraine war, having abstained from condemning the invasion from the outset. These firms were eventually hit with a 50% US tariff in 2025 over India's purchases of Russian oil and alleged role in funding the war

(Jones & MacRae, 2025). Decoupling from a risky source without attending to the destination's risk profile (e.g., alliance-based position) may simply substitute one risk exposure for another. True de-risking thus depends not only on which market a firm decouples from but also on the composition of the base that remains.

Managers should also recognize that the three de-risking strategies can work against one another. Decoupling without genuine diversification risks re-concentrating dependence in a handful of alternative hubs. This risk is visible in our data. Consistent with Niu et al. (2025), we find no evidence of diversification across additional countries. This contrasts with firms' announcements (Free et al., 2026), which suggest that firms sourcing away from China venture into multiple new countries. Two explanations may account for this discrepancy. One possibility is that the firms that publicly voice an intention to shift sourcing away from China are atypical firms that can afford to enter multiple new locations. Another is that firms exposed to China during our sample period have long pursued a "China-plus-one" strategy, maintaining supply bases elsewhere, and therefore need only rebalance flows among existing countries rather than expand into additional ones. Managers should thus ensure that decoupling does not substitute one dependence for another. The other strategies carry their own costs. Diversification is costly to coordinate (Choi & Krause, 2006; Dong et al., 2020), and friendshoring narrows the set of acceptable destinations (Charpin & Cousineau, 2025). Managers should weigh these limits when designing their de-risking approach, as no single strategy delivers a fully de-risked sourcing portfolio.

6.3 Policymaking implications

Friendshoring has been placed high on policymakers' de-risking agendas, as highlighted by initiatives ranging from US Treasury Secretary Yellen's call to source from trusted, like-minded partners (US Department of the Treasury, 2022) to the von der Leyen pillars (von der Leyen, 2023) and the G7 communiqué (European Council, 2023). Yet we find no evidence that firms friendshore during the alliance-based shock for which the strategy is intended. If anything, the political alignment of the non-China portfolio deteriorated during the Russia–Ukraine war. While geopolitical considerations play a major role in pushing firms away from China, pull factors in new destinations are dominated by cost and

capability considerations (Free et al., 2026). Political alignment therefore does not appear to drive firm sourcing as policymakers hope, and the friendshoring ambition translates only weakly into observed behavior. Our findings suggest that governments may have limited ability to steer firms' sourcing decisions, echoing Paulraj et al. (2025), who find that even strong government checks and balances are insufficient to mitigate the negative effect of populism on firms' sourcing decisions. Redirecting supply chains toward US-aligned partners may require stronger incentives, or a recognition that cost-competitive, politically aligned alternatives are scarce.

This discrepancy is most pronounced exactly where policy is most assertive. Techno-nationalist measures, such as the 2022 US CHIPS and Science Act, aim to push high-tech and semiconductor firms to de-risk because they are seen as the most exposed and strategically critical (Luo & Van Assche, 2023; Zhang, 2023). Our results provide little support for this expectation. High-tech firms decouple and diversify no more than their peers in any period; the one exception is an increase in the political alignment of their non-China sourcing base, and only during the trade war. The firms under the greatest government pressure to adjust appear the least able to do so. An explanation could lie in the nature of high-tech supply relationships. Firms can obtain knowledge they cannot create internally from external partners such as their suppliers (Gaimon & Ramachandran, 2021), and the supply base accordingly plays a critical role in a firm's innovativeness (Dong et al., 2020). High-tech firms thus collaborate on highly specialized and complex tasks, making their supply ties difficult to replace. Fan et al. (2024) illustrate this technology embeddedness, finding that Chinese suppliers with higher innovation capabilities were more likely to retain their buyers during the US–China trade war. The scarcity of alternatives for specific technologies, combined with ongoing industry consolidation, may also explain why firms in the semiconductor and semiconductor-equipment industries increased their sourcing concentration rather than diversifying during the Russia–Ukraine war. High-tech firms may therefore have little room to reconfigure their portfolios, regardless of policy pressure.

6.4. Limitations and future research

Our study has limitations that open avenues for future research. First, our sample comprises US publicly traded importers, limiting the generalizability of our findings beyond US firms. This caveat applies particularly to friendshoring because political alignment is home-country dependent. Each origin country's alignment is measured relative to the US, so the same destination can be a trusted partner for one home country and a source of risk for another. Future research could replicate our design with firms from other home countries. Second, we observe firms' sourcing behavior rather than their intent, so we cannot establish whether a reconfiguration reflects a deliberate de-risking strategy or a response driven by cost or capacity considerations. Our robustness checks partially alleviate this concern, as the industry-by-year fixed effects absorb cost and capacity shocks common to all firms in an industry in a given year. They cannot, however, reveal the motives behind individual firms' reconfigurations. Future research could pair trade data with managerial surveys to close this gap. Third, the Panjiva US dataset records seaborne imports only. We recover Mexican overland flows by appending Panjiva's Mexico export records, but no equivalent correction exists for Canada, an undercoverage common to all studies relying on this database. This gap could bias our estimates if the missing flows moved with the disruptions. Canada is both an additional origin country and one of the most politically aligned sourcing locations during our sample period. As a result, unobserved overland reallocation toward Canada would cause us to understate the true response, making our null findings on diversification and friendshoring conservative. To assess whether this scenario is plausible, we examine aggregate trade statistics covering all transport modes and track Canada's position in US sourcing across the sample period (Appendix 7). The data show no relocation toward Canada. Its share of total US goods imports has moved within a narrow band since 2011 with no upward trend, and the overland channel our data cannot observe has declined slightly in recent years. Free et al. (2026) likewise record not a single relocation announcement out of China toward Canada. This aggregate evidence cannot rule out relocation by individual firms in our sample, but it makes an economy-wide shift toward Canada implausible. Future work drawing on customs data covering all transport modes could nonetheless refine the measurement of the three de-risking strategies.

Acknowledgements

The authors sincerely thank the Guest Editors and anonymous reviewers for their valuable feedback and guidance throughout the review process. This work was supported by the Fonds de recherche du Québec - Société et culture.

References

Bailey, M. A., Strezhnev, A., & Voeten, E. (2017). Estimating dynamic state preferences from United Nations voting data. *Journal of Conflict Resolution*, *61*(2), 430-456. https://doi.org/10.1177/0022002715595700

Bednarski, L., Roscoe, S., Blome, C., & Schleper, M. C. (2025). Geopolitical disruptions in global supply chains: a state-of-the-art literature review. *Production Planning & Control*, *36*(4), 536-562. https://doi.org/10.1080/09537287.2023.2286283

Bednarski, L., Subramanian, N., Roscoe, S., & Blome, C. (2026). Geopolitical rivalry over strategically important industries: understanding the effects on global supply chain design. *Production Planning & Control*, *37*(6), 596-618. https://doi.org/10.1080/09537287.2025.2570203

Borusyak, K., Jaravel, X., & Spiess, J. (2024). Revisiting event-study designs: Robust and efficient estimation. *Review of Economic Studies*, 91(6), 3253-3285. https://doi.org/10.1093/restud/rdae007

Boyd, B. K., Gove, S., & Hitt, M. A. (2005). Construct measurement in strategic management research: Illusion or reality? *Strategic Management Journal*, 26(3), 239-257. https://doi.org/10.1002/smj.444

Brush, T. H., Maritan, C. A., & Karnani, A. (1999). The plant location decision in multinational manufacturing firms: An empirical analysis of international business and manufacturing strategy perspectives. *Production and Operations Management*, *8*(2), 109-132. https://doi.org/10.1111/j.1937-5956.1999.tb00365.x

Capri, A. (2023). China decoupling versus de-risking: What's the difference? The Hinrich Foundation. https://www.hinrichfoundation.com/research/article/trade-geopolitics/china-decoupling-vs-de-risking. Accessed, September 5, 2026.

Charoenwong, B., Han, M., & Wu, J. (2023). Trade and foreign economic policy uncertainty in supply chain networks: who comes home?. *Manufacturing & Service Operations Management*, *25*(1), 126-147. https://doi.org/10.1287/msom.2022.1136

Charpin, R. (2022). The resurgence of nationalism and its implications for supply chain risk management. *International Journal of Physical Distribution & Logistics Management*, *52*(1), 4-28. https://doi.org/10.1108/ijpdlm-01-2021-0019

Charpin, R., & Cousineau, M. (2025). Friendshoring: how geopolitical tensions affect foreign sourcing, supply base complexity, and sub-tier supplier sharing. *International Journal of Operations & Production Management*, *45*(5), 1006-1031. https://doi.org/10.1108/ijopm-01-2024-0067

Charpin, R., London, J., & Vincent, N. (2024). The effect of geopolitical tensions on international research collaborations and its implications for global operations management. *International Journal of Production Economics*, *268*, 109120. https://doi.org/10.1016/j.ijpe.2023.109120

Choi, T. Y., & Krause, D. R. (2006). The supply base and its complexity: Implications for transaction costs, risks, responsiveness, and innovation. *Journal of Operations Management*, *24*(5), 637-652. https://doi.org/10.1016/j.jom.2005.07.002

Cichanowicz, T., Zhang, J. J., & Vortherms, S. (2026). Decoupling or Business as Usual? How Japanese Multinational Corporations Adapt to Political Risk in China. *International Relations of the Asia-Pacific*. https://doi.org/10.1093/irap/lcaf015

Cloodt, M., Hagedoorn, J., & Van Kranenburg, H. (2006). Mergers and acquisitions: Their effect on the innovative performance of companies in high-tech industries. *Research policy*, *35*(5), 642-654. https://doi.org/10.1016/j.respol.2006.02.007

Cohen, M. A., Cui, S., Ernst, R., Huchzermeier, A., Kouvelis, P., Lee, H. L., ... & Tsay, A. A. (2018). OM Forum—Benchmarking global production sourcing decisions: Where and why firms offshore and reshore. *Manufacturing & Service Operations Management*, *20*(3), 389-402. https://doi.org/10.1287/msom.2017.0666

Cohen, M. A., & Kouvelis, P. (2021). Revisit of AAA excellence of global value chains: Robustness, resilience, and realignment. *Production and Operations Management*, *30*(3), 633-643. https://doi.org/10.1111/poms.13305

Cohen, M. A., & Lee, H. L. (2020). Designing the right global supply chain network. *Manufacturing & Service Operations Management*, *22*(1), 15-24. https://doi.org/10.1287/msom.2019.0839

Correia, S. (2017). reghdfe: Stata module for linear and instrumental-variable/GMM regression absorbing multiple levels of fixed effects. *Statistical Software Components s457874, Boston College Department of Economics*.

Correia, S., Guimaraes, P., & Zylkin, T. (2020). Fast Poisson estimation with high-dimensional fixed effects. *The Stata Journal*, 20(1), 95-115. https://doi.org/10.1177/1536867X20909691

Craighead, C. W., Ketchen Jr, D. J., & Darby, J. L. (2020). Pandemics and supply chain management research: toward a theoretical toolbox. *Decision Sciences*, *51*(4), 838-866. https://doi.org/10.1111/deci.12468

Cui, V., Vertinsky, I., Wang, Y., & Zhou, D. (2023). Decoupling in international business: The 'new'vulnerability of globalization and MNEs' response strategies. *Journal of International Business Studies*, 54, 1562-1576. https://doi.org/10.1057/s41267-023-00602-5

Day, S. J., Godsell, J., & Shou, Y. (2025). Impact Pathways: Caught in the deglobalisation crosswind? De-risking by "China+ 1" or "In-China-For-China". *International Journal of Operations & Production Management*, *45*(5), 995-1005. https://doi.org/10.1108/ijopm-04-2024-0290

Dong, M. C., Huang, Q., & Liu, Z. (2022). Adjusting supply chain involvement in countries with politician turnover: A contingency framework. *Journal of Operations Management*, *68*(8), 824-854. https://doi.org/10.1002/joom.1213

Dong, Y., Skowronski, K., Song, S., Venkataraman, S., & Zou, F. (2020). Supply base innovation and firm financial performance. *Journal of Operations Management*, *66*(7-8), 768-796. https://doi.org/10.1002/joom.1107

Edgerton, D. E. (2007). The contradictions of techno-nationalism and techno-globalism: A historical perspective. *New Global Studies*, *1*(1). https://doi.org/10.2202/1940-0004.1013

Ellram, L. M., Tate, W. L., & Billington, C. (2008). Offshore outsourcing of professional services: A transaction cost economics perspective. *Journal of Operations Management*, *26*(2), 148-163. https://doi.org/10.1016/j.jom.2007.02.008

Ellram, L. M., Tate, W. L., & Petersen, K. J. (2013). Offshoring and reshoring: an update on the manufacturing location decision. *Journal of Supply Chain Management*, *49*(2), 14-22. https://doi.org/10.1111/jscm.12019

European Council (2023). G7 Hiroshima Leaders' Communiqué. Retrieved from https://www.consilium.europa.eu/en/press/press-releases/2023/05/20/g7-hiroshima-leaders-communique/. Accessed, September 5, 2026.

Evenett, S. J. (2020). Chinese whispers: COVID-19, global supply chains in essential goods, and public policy. *Journal of International Business Policy*, *3*(4), 408-429. https://doi.org/10.1057/s42214-020-00075-5

Evenett, S. J., & Pisani, N. (2023). Geopolitics, conflict, and decoupling: evidence of Western divestment from Russia during 2022. *Journal of International Business Policy*, *6*(4), 511-540. https://doi.org/10.1057/s42214-023-00167-y

Fama, E. F., & French, K. R. (1992). The cross-section of expected stock returns. *The Journal of Finance, 47*(2), 427-465. https://doi.org/10.1111/j.1540-6261.1992.tb04398.x

Fan, D., Ma, P., Cui, L., & Yiu, D. W. (2024). Locking in overseas buyers amid geopolitical conflicts. *Journal of Operations Management*, *70*(5), 756-792. https://doi.org/10.1002/joom.1316

Fan, D., Zhou, Y., Yeung, A. C., Lo, C. K., & Tang, C. (2022). Impact of the US–China trade war on the operating performance of US firms: The role of outsourcing and supply base complexity. *Journal of Operations Management*, *68*(8), 928-962. https://doi.org/10.1002/joom.1225

Ferdows, K. (1997). Making the most of foreign factories. *Harvard Business Review*, *75*(2), 73-88.

Free, C., O'Connor, N. G., & Wieland, A. (2026). Global supply chains on the move: panarchical reorganisation out of China. *International Journal of Operations & Production Management*, *46*(1), 46-72. https://doi.org/10.1108/ijopm-03-2025-0209

Gaimon, C., & Ramachandran, K. (2021). The knowledge value chain: An operational perspective. *Production and Operations Management*, *30*(3), 715-724. https://doi.org/10.1111/poms.13312

Gormley, T. A., & Matsa, D. A. (2014). Common errors: How to (and not to) control for unobserved heterogeneity. *Review of Financial Studies*, 27(2), 617-661. https://doi.org/10.1093/rfs/hht047

Hsu, J., Li, Z., & Wu, J. (2026). Supply chain nearshoring in response to regional value content requirements. *Manufacturing & Service Operations Management*, *28*(3), 762-782. https://doi.org/10.1287/msom.2024.1555

Huang, Y., Lin, C., Liu, S., & Tang, H. (2023). Trade networks and firm value: Evidence from the US-China trade war. *Journal of International Economics*, *145*, 103811. https://doi.org/10.1016/j.jinteco.2023.103811

Ivanov, D. (2020). Predicting the impacts of epidemic outbreaks on global supply chains: A simulation-based analysis on the coronavirus outbreak (COVID-19/SARS-CoV-2) case. *Transportation Research Part E: Logistics and Transportation Review*, *136*, 101922. https://doi.org/10.1016/j.tre.2020.101922

Jacobs, B. W., Singhal, V. R., & Zhan, X. (2022). Stock market reaction to global supply chain disruptions from the 2018 US government ban on ZTE. *Journal of Operations Management*, *68*(8), 903-927. https://doi.org/10.1002/joom.1197

Jain, N., & Wu, D. (2023). Can global sourcing strategy predict stock returns?. *Manufacturing & Service Operations Management*, *25*(4), 1357-1375. https://doi.org/10.1287/msom.2023.1189

Jones, C., MacRae, P. (2025). Trump imposes 50% tariff on India as punishment for buying Russian oil. https://www.theguardian.com/us-news/2025/aug/27/trump-tariff-india-russian-oil-purchase. Accessed, September 5, 2026.

Klarin, A., & Sosnovskikh, S. (2025). Leveraging friendshoring in response to sanctions: Essential insights for global managers. *Business Horizons*. https://doi.org/10.1016/j.bushor.2024.10.002

Lei, G., Wei, J., & Ma, J. (2026). Firm-level trade decoupling risk and cross-border supply chain reconfiguration: evidence from Chinese firms. *International Journal of Operations & Production Management*, 1-25. https://doi.org/10.1108/IJOPM-11-2025-1190

Leung, W. S., & Sun, J. (2021). Policy uncertainty and customer concentration. *Production and Operations Management, 30*(5), 1517-1542. https://doi.org/10.1111/poms.13335

Lin, Y., Fan, D., Shi, X., & Fu, M. (2021). The effects of supply chain diversification during the COVID-19 crisis: Evidence from Chinese manufacturers. Transportation Research Part E: Logistics and Transportation Review, 155, 102493. https://doi.org/10.1016/j.tre.2021.102493

Liu, X., Hassan, J., Gao, H., & Sharma, R. R. (2025). A typology of de-coupling in international sourcing by MNEs in selective de-globalization. *Journal of International Management*, 101304. https://doi.org/10.1016/j.intman.2025.101304

Luo, C., & Wang, N. (2025). US-China Trade Tensions and Their Supply Chain Relationships: Evidence From US Listed Firms. *Review of International Economics*. https://doi.org/10.1111/roie.70039

Luo, Y. (2022). Illusions of techno-nationalism. *Journal of International Business Studies*, *53*(3), 550-567. https://doi.org/10.1057/s41267-021-00468-5

Luo, Y., & Van Assche, A. (2023). The rise of techno-geopolitical uncertainty: Implications of the United States CHIPS and Science Act. *Journal of International Business Studies*, 54, 1423-1440. https://doi.org/10.1057/s41267-023-00620-3

MacCarthy, B. L., & Atthirawong, W. (2003). Factors affecting location decisions in international operations–a Delphi study. *International Journal of Operations & Production Management*, *23*(7), 794-818. https://doi.org/10.1108/01443570310481568

McCarthy, K. J., & Aalbers, H. L. (2022). Alliance-to-acquisition transitions: The technological performance implications of acquiring one's alliance partners. *Research Policy*, *51*(6), 104512. https://doi.org/10.1016/j.respol.2022.104512

Moradlou, H., Reefke, H., Skipworth, H., & Roscoe, S. (2021). Geopolitical disruptions and the manufacturing location decision in multinational company supply chains: a Delphi study on Brexit. *International Journal of Operations & Production Management*, 41(2), 102-130. https://doi.org/10.1108/ijopm-07-2020-0465

Moradlou, H., Skipworth, H., Bals, L., Aktas, E., & Roscoe, S. (2025). Geopolitical disruptions and supply chain structural ambidexterity. *International Journal of Operations & Production Management*, *45*(4), 836-862. https://doi.org/10.1108/ijopm-11-2023-0915

Niu, Y., Werle, N., Cohen, M., Cui, S., Deshpande, V., Ernst, R., ... & Wu, J. (2025). Restructuring global supply chains: Navigating challenges of the COVID-19 pandemic and beyond. *Manufacturing & Service Operations Management*, *27*(4), 1025-1036. https://doi.org/10.1287/msom.2024.0879

Nujen, B. B., Solli-Saether, H., Mwesiumo, D., & Hammer, B. (2021). Reputational risk as a factor in the offshore location choice. *Journal of Purchasing and Supply Management*, *27*(2), 100682. https://doi.org/10.1016/j.pursup.2021.100682

Papke, L. E., & Wooldridge, J. M. (1996). Econometric methods for fractional response variables with an application to 401(k) plan participation rates. *Journal of Applied Econometrics*, 11(6), 619-632. https://doi.org/10.1002/(SICI)1099-1255(199611)11:6<619::AID-JAE418>3.0.CO;2-1

Patel, P. C., & Richter, J. I. (2025). Self-interest over ethics: Firm withdrawal from Russia after the Ukraine invasion. *Journal of Business Ethics*, *199*(2), 365–391. https://doi.org/10.1007/s10551-024-05836-3

Paulraj, A., Datar, A., Nakamura, A., & Seepana, C. (2025). Navigating sociopolitical waters: exploring the influence of key factors on global supply base concentration. *International Journal of Operations & Production Management*, 45(5), 1066-1089. https://doi.org/10.1108/ijopm-03-2024-0260

Phadnis, S., & Joglekar, N. (2021). Configuring supply chain dyads for regulatory disruptions: A behavioral study of scenarios. *Production and Operations Management*, *30*(4), 1014-1033. https://doi.org/10.1111/poms.13290

Ren, M., Chugh, R., & Gao, H. (2024). Fencing or balancing? An exploratory study of Australian and New Zealand exporters' strategic responses during the US-China trade war. *International Marketing Review*, *41*(3-4), 642-682. https://doi.org/10.1108/imr-07-2023-0139

Roscoe, S., Aktas, E., Petersen, K. J., Skipworth, H. D., Handfield, R. B., & Habib, F. (2022). Redesigning global supply chains during compounding geopolitical disruptions: the role of supply chain logics. *International Journal of Operations & Production Management*, 42(9), 1407-1434. https://doi.org/10.1108/ijopm-12-2021-0777

Santos Silva, J. M. C., & Tenreyro, S. (2006). The log of gravity. *The Review of Economics and Statistics*, 88(4), 641-658. https://doi.org/10.1162/rest.88.4.641

Schleper, M. C., Duensing, S., & Busse, C. (2024). Shifting the context: reviews and research agendas for traditional, reputational and societal supply chain risk. *Supply Chain Management: An International Journal*, *29*(7), 135-163. https://doi.org/10.1108/scm-04-2024-0280

Schmidheiny, K., & Siegloch, S. (2023). On event studies and distributed-lags in two-way fixed effects models: Identification, equivalence, and generalization. *Journal of Applied Econometrics*, 38(5), 695-713. https://doi.org/10.1002/jae.2971

Shu, W., & Fan, D. (2024). How do firms perceive and react to extreme weather risk in their supply bases?. *International Journal of Production Economics*, 268, 109125. https://doi.org/10.1016/j.ijpe.2023.109125

Srai, J. S., Graham, G., Van Hoek, R., Joglekar, N., & Lorentz, H. (2023). Impact pathways: unhooking supply chains from conflict zones—reconfiguration and fragmentation lessons from the Ukraine–Russia war. *International Journal of Operations & Production Management*, 43(13), 289-301. https://doi.org/10.1108/ijopm-08-2022-0529

Statistics Canada. (2026). Canadian international merchandise trade by mode of transport, customs-based (Table 12-10-0177-01). https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1210017701. Accessed, September 5, 2026.

Tse, Y. K., Dong, K., Sun, R., & Mason, R. (2024). Recovering from geopolitical risk: An event study of Huawei's semiconductor supply chain. *International Journal of Production Economics*, *275*, 109347. https://doi.org/10.1016/j.ijpe.2024.109347

US Census Bureau. (2026). Trade in goods with Canada, trade in goods with Mexico, and U.S. trade in goods with world, not seasonally adjusted. Foreign Trade Division. https://www.census.gov/foreign-trade/balance/. Accessed, September 5, 2026.

US Department of Health and Human Services (2024). Policy Considerations to Prevent Drug Shortages and Mitigate Supply Chain Vulnerabilities in the United States. https://aspe.hhs.gov/sites/default/files/documents/3a9df8acf50e7fda2e443f025d51d038/HHS-White-Paper-Preventing-Shortages-Supply-Chain-Vulnerabilities.pdf. Accessed, September 5, 2026.

US Department of the Treasury (2022, April 13). *Remarks by Secretary of the Treasury Janet L. Yellen on Way Forward for the Global Economy*, https://home.treasury.gov/news/press-releases/jy0714. Accessed, September 5, 2026.

van Hoek, R., & Dobrzykowski, D. (2021). Towards more balanced sourcing strategies–are supply chain risks caused by the COVID-19 pandemic driving reshoring considerations?. *Supply Chain Management: An International Journal*, *26*(6), 689-701. https://doi.org/10.1108/scm-09-2020-0498

Vereecke, A., & Van Dierdonck, R. (2002). The strategic role of the plant: testing Ferdows's model. *International Journal of Operations & Production Management*, *22*(5), 492-514. https://doi.org/10.1108/01443570210425147

Vereecke, A., Van Dierdonck, R., & De Meyer, A. (2006). A typology of plants in global manufacturing networks. *Management Science*, *52*(11), 1737-1750. https://doi.org/10.1287/mnsc.1060.0582

Vivoda, V., & Matthews, R. (2024). "Friend-shoring" as a panacea to Western critical mineral supply chain vulnerabilities. *Mineral Economics*, *37*(3), 463-476. https://doi.org/10.1007/s13563-023-00402-1

von der Leyen, U. (2023). Speech by President von der Leyen on EU-China relations to the Mercator Institute for China Studies and the European Policy Centre. https://ec.europa.eu/commission/presscorner/detail/en/speech_23_2063. Accessed, September 5, 2026.

Wang, Q., Zhou, H., & Zhao, X. (2024). The role of supply chain diversification in mitigating the negative effects of supply chain disruptions in COVID-19. *International Journal of Operations & Production Management*, *44*(1), 99-132. https://doi.org/10.1108/ijopm-09-2022-0567

Witt, M. A., Lewin, A. Y., Li, P. P., & Gaur, A. (2023). Decoupling in international business: Evidence, drivers, impact, and implications for IB research. *Journal of World Business*, *58*(1), 101399. https://doi.org/10.1016/j.jwb.2022.101399

Yoon, H., Peillex, J., & Buckley, P. J. (2021). Friends or foes? Bilateral relationships and ownership choice in cross-border acquisitions by emerging market firms. *British Journal of Management*, *32*(3), 852-871. https://doi.org/10.1111/1467-8551.12442

Zhang, K. H. (2023). US-China economic links and technological decoupling. *The Chinese Economy*, *56*(5), 353-365. https://doi.org/10.1080/10971475.2023.2173399

Zhou, N., Li, J., & Wang, J. (2024). Bilateral political tension and the signaling role of patenting in a host country. *Journal of International Business Studies*, *55*(3), 396-407. https://doi.org/10.1057/s41267-023-00657-4

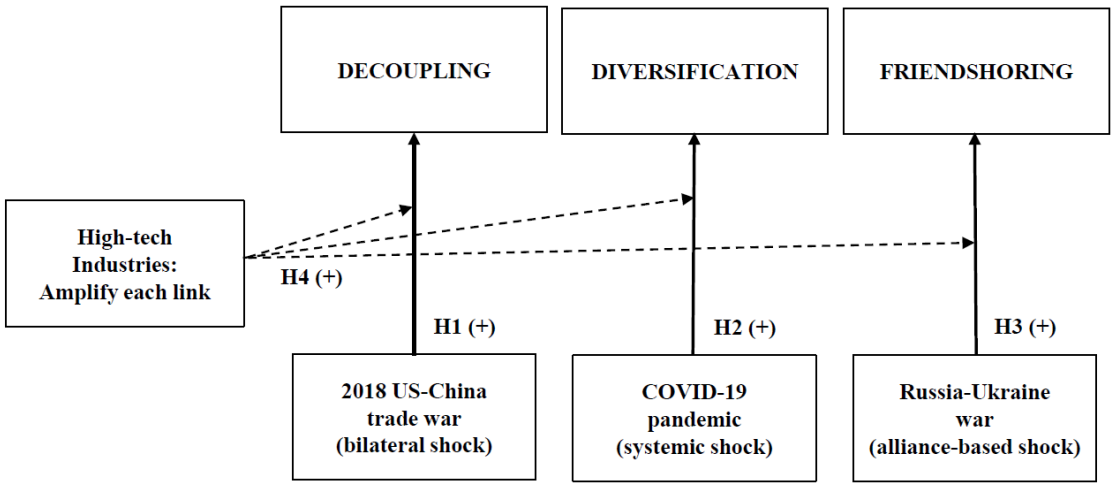

Figure 1. Theoretical framework

Source: Authors' own work

Table I. Descriptive statistics

Variables	N	Mean	SD	Min	Max
Decoupling	15,457	0.003	0.105	-0.333	0.333
Diversification (share)	15,457	0.434	0.276	0.000	0.880
Diversification (share non-CHN)	14,451	0.460	0.296	0.000	0.895
Diversification (count)	15,457	9.700	9.504	1.000	45
Friendshoring	15,341	-2.468	0.609	-3.497	-0.877
Friendshoring (non-CHN)	14,026	-2.091	0.636	-3.416	-0.659
China exposure	15,457	0.401	0.336	0.000	1
High-tech	15,457	0.168	0.374	0.000	1
Semiconductor	15,457	0.030	0.172	0.000	1
Log (total assets)	15,457	7.327	2.112	0.469	11.720
ROA	15,457	0.000	0.272	-2.696	0.278
Leverage	15,457	0.249	0.211	0.000	1.049
Decoupling (annual)	15,457	0.003	0.253	-1	1
Substitution	15,457	0.004	0.122	-0.562	0.678

Source: Authors' own work

Table II. Main results: The effect of China exposure on firms' de-risking strategies across geopolitical disruptions

	(1) Decoupling	(2) Diversif. (share)	(3) Diversif. (share, non-CHN)	(4) Diversif. (count)	(5) Friendshoring	(6) Friendsh. (non-CHN)
Trade war × chnexp	.384***	.008	-.025	-.009	.023	-.002
	(.025)	(.018)	(.02)	(.01)	(.017)	(.022)
COVID-19 × chnexp	.451***	.082***	-.023	.001	.069***	-.052*
	(.029)	(.021)	(.024)	(.012)	(.02)	(.028)
Russia-Ukraine × chnexp	.331***	.109***	-.025	.013	-.024	-.083***
	(.029)	(.023)	(.025)	(.017)	(.026)	(.029)
Log (total assets)	.04	.162***	.239***	.254***	-.029	-.02
	(.065)	(.045)	(.051)	(.035)	(.046)	(.058)
ROA	.031	-.003	.017	-.015**	.018	.017
	(.027)	(.013)	(.021)	(.007)	(.015)	(.022)
Leverage	-.008	-.001	-.005	-.018*	-.011	.015
	(.024)	(.014)	(.015)	(.01)	(.015)	(.018)
Observations	15,457	15,457	14,451	15,457	15,341	14,026
Firms	1,565	1,565	1,487	1,565	1,559	1,462
Within R-squared	0.035	0.007	0.005	0.013	0.003	0.002
R-squared	0.175	0.662	0.670	0.886	0.659	0.629
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-specific linear trends	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*
Source: Authors' own work

Table III. The effect of China exposure on firms' de-risking strategies across geopolitical disruptions: Moderating role of high-tech industries

	(1) Decoupling	(2) Diversif. (share)	(3) Diversif. (share, non-CHN)	(4) Diversif. (count)	(5) Friendshoring	(6) Friendsh. (non-CHN)
Trade war × chnexp × HT	.042	.037	.039	.009	.016	.123**
	(.06)	(.051)	(.055)	(.021)	(.04)	(.053)
COVID-19 × chnexp × HT	.061	.017	.09	.042	.023	.064
	(.069)	(.059)	(.064)	(.028)	(.048)	(.074)
Russ-Ukra × chnexp × HT	.065	.028	.058	.029	.096	-.012
	(.082)	(.064)	(.062)	(.036)	(.063)	(.078)
Log (total assets)	.039	.164***	.24***	.255***	-.031	-.019
	(.065)	(.045)	(.051)	(.035)	(.046)	(.058)
ROA	.031	-.003	.017	-.015**	.016	.018
	(.027)	(.013)	(.021)	(.007)	(.015)	(.022)
Leverage	-.009	-.002	-.005	-.018*	-.012	.015
	(.024)	(.014)	(.015)	(.01)	(.015)	(.018)
Observations	15,457	15,457	14,451	15,457	15,341	14,026
Firms	1,565	1,565	1,487	1,565	1,559	1,462
Within R-squared	0.036	0.008	0.007	0.013	0.005	0.003
R-squared	0.176	0.662	0.67	0.886	0.660	0.629
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-specific linear trends	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1*
Source: Authors' own work

Table IV. Transition (period-to-period) effects of China exposure on de-risking strategies

	(1) Decoupl.	(2) Diversif. (share)	(3) Diversif. (share, non-CHN)	(4) Diversif. (count)	(5) Friendsh.	(6) Friendsh. (non-CHN)
Trade war vs. baseline	.384***	.008	-.025	-.009	.023	-.002
	(.025)	(.018)	(.020)	(.01)	(.017)	(.022)
COVID-19 vs. trade war	.067**	.074***	.001	.01	.046***	-.049**
	(.03)	(.018)	(.021)	(.009)	(.017)	(.024)
Russia-Ukraine vs. COVID-19	-.120***	.027	-.001	.013	-.093***	-.031
	(.034)	(.019)	(.02)	(.011)	(.021)	(.022)
Observations	15,457	15,457	14,451	15,457	15,341	14,026
Firms	1,565	1,565	1,487	1,565	1,559	1,462
Within R-squared	0.035	0.007	0.005	0.013	0.003	0.002
R-squared	0.175	0.662	0.670	0.886	0.659	0.629
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-specific linear trends	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1*
Source: Authors' own work

Table V. The effect of China exposure on firms' de-risking strategies across geopolitical disruptions: Moderating role of the semiconductor industry

	(1) Decoupling	(2) Diversif. (share)	(3) Diversif. (share, non-CHN)	(4) Diversif. (count)	(5) Friendshoring	(6) Friendsh. (non-CHN)
Trade war × chnexp × semi	.137	-.067	-.097	.021	-.133	.022
	(.153)	(.148)	(.115)	(.032)	(.112)	(.129)
COVID-19 × chnexp × semi	-.008	-.051	-.018	.031	-.074	.064
	(.173)	(.136)	(.117)	(.033)	(.08)	(.133)
Russ-Ukra × chnexp × semi	-.291*	-.24**	-.212**	-.02	-.091	-.025
	(.171)	(.103)	(.095)	(.046)	(.102)	(.122)
Log (total assets)	.046	.166***	.241***	.254***	-.028	-.022
	(.065)	(.045)	(.052)	(.035)	(.046)	(.058)
ROA	.032	-.003	.017	-.015**	.017	.016
	(.028)	(.013)	(.021)	(.007)	(.015)	(.022)
Leverage	-.006	0	-.004	-.018*	-.011	.016
	(.024)	(.014)	(.015)	(.01)	(.015)	(.018)
Observations	15,457	15,457	14,451	15,457	15,341	14,026
Firms	1,565	1,565	1,487	1,565	1,559	1,462
Within R-squared	0.036	0.008	0.006	0.013	0.003	0.003
R-squared	0.176	0.662	0.670	0.886	0.659	0.629
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-specific linear trends	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors are in parentheses
*** *p<.01,* ** *p<.05,* * *p<.1*
Source: Authors' own work

Appendix 1. De-risking variable definitions and formulas

Let $V_{i,t}^{c}$ denote the import volume of firm i from country c on year t with $V_{i,t}^{\text{CHN}}$ denoting the volume for China, $V_{i,t}^{TOT} = \sum_c V_{i,t}^{c}$ denoting the total volume across all countries and $V_{i,t}^{\overline{CHN}} = V_{i,t}^{TOT} - V_{i,t}^{\text{CHN}}$ denoting the total that excludes China. Also, let $\Delta x_t = x_t - x_{t-1}$.

Variable	Definition	Formula
Decoupling (annual)	Year-over-year decline in firm's annual China import share (positive = decoupling).	$D_{i,t}^{\text{annual}} = -\Delta s_{i,t}^{\text{CHN}}$ where $s_{i,t}^{\text{CHN}} = V_{i,t}^{\text{CHN}} / V_{i,t}^{\text{TOT}}$
Decoupling	Year-over-year decline in firm's smoothed China import share (positive = decoupling).	$D_{i,t} = -\Delta \bar{s}_{i,t}^{\text{CHN}}$ where $\bar{s}_{i,t}^{\text{CHN}} = \frac{1}{3}\left(s_{i,t-2}^{\text{CHN}} + s_{i,t-1}^{\text{CHN}} + s_{i,t}^{\text{CHN}}\right)$
Diversification (count)	Number of distinct origin countries with positive imports in year t.	$D_{i,t}^{\text{count}} = \left\lvert\{c : V_{i,t}^{c} > 0\}\right\rvert$
Diversification (share)	1 – HHI (Herfindahl-Hirschman Index) of firm import shares across origin countries (higher = more diversified).	$D_{i,t}^{\text{share}} = 1 - \sum_c \left(s_{i,t}^{c}\right)^2$ where $s_{i,t}^{c} = V_{i,t}^{c} / V_{i,t}^{\text{TOT}}$
Diversification (share non-CHN)	1 - HHI computed on non-China import shares only.	$D_{i,t}^{\text{share},\overline{CHN}} = 1 - \sum_{c \neq \text{CHN}} \left(\tilde{s}_{i,t}^{c}\right)^2$ where $\tilde{s}_{i,t}^{c} = V_{i,t}^{c} / V_{i,t}^{\overline{\text{CHN}}}$
Friendshoring	Negative of firm's volume weighted IPD-USA score across all origins (higher = more US-aligned).	$F_{i,t} = -\frac{\sum_c V_{i,t}^{c} \cdot IPDUSA_t^{c}}{V_{i,t}^{\text{TOT}}}$
Friendshoring (non-CHN)	Same as *Friendshoring* but excluding China imports.	$F_{i,t}^{\overline{\text{CHN}}} = -\frac{\sum_{c \neq \text{CHN}} V_{i,t}^{c} \cdot IPDUSA_t^{c}}{V_{i,t}^{\overline{\text{CHN}}}}$
Substitution	Measures the import volume swapped between China and the rest of the world (ROW). Non-zero only when their volumes move in opposite directions within a year, its magnitude is the smaller of the two absolute changes divided by prior-year total imports; positive values denote a shift from China to ROW.	$Sub_{i,t} = \begin{cases} \text{sign}\left(-\Delta V_{i,t}^{\text{CHN}}\right) \cdot \frac{\min\left(\lvert\Delta V_{i,t}^{\text{CHN}}\rvert, \lvert\Delta V_{i,t}^{\overline{\text{CHN}}}\rvert\right)}{V_{i,t-1}^{\text{TOT}}}, \\ \quad \text{if } \Delta V_{i,t}^{\text{CHN}} \cdot \Delta V_{i,t}^{\overline{\text{CHN}}} < 0 \\ 0, \text{ otherwise} \end{cases}$
ChinaExposure	Firm-specific pre-period China import share, averaged over 2015-2017.	$ChinaExposure_i = \frac{1}{3} \sum_{t=2015}^{2017} s_{i,t}^{\text{CHN}}$

Source: Authors' own work

Appendix 2. Robustness check: Industry-by-year fixed effects. Main results

	(1)	(2)	(3)	(4)	(5)	(6)
	Decoupling	Diversif. (share)	Diversif. (share, non-CHN)	Diversif. (count)	Friendshoring	Friendsh. (non-CHN)
Trade war × chnexp	.414***	.007	-.023	-.01	.021	-.005
	(.027)	(.02)	(.022)	(.01)	(.018)	(.024)
COVID-19 × chnexp	.476***	.078***	-.037	-.004	.08***	-.04
	(.031)	(.023)	(.026)	(.013)	(.021)	(.03)
Russ-Ukra × chnexp	.32***	.108***	-.026	.015	-.009	-.083***
	(.03)	(.025)	(.026)	(.018)	(.027)	(.031)
Log (total assets)	.036	.164***	.241***	.253***	-.025	-.018
	(.068)	(.047)	(.054)	(.036)	(.048)	(.059)
ROA	.021	-.006	.012	-.018**	.017	.007
	(.028)	(.014)	(.021)	(.007)	(.016)	(.023)
Leverage	-.014	-.001	-.001	-.016	-.009	.015
	(.024)	(.014)	(.015)	(.011)	(.016)	(.019)
Observations	15,409	15,409	14,407	15,409	15,292	13,984
Firms	1,559	1,559	1,482	1,559	1,553	1,457
Within R-squared	0.037	0.007	0.005	0.013	0.002	0.002
R-squared	0.221	0.676	0.683	0.890	0.677	0.646
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-by-year FE	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1*
Source: Authors' own work

Appendix 3. Robustness check: Industry-by-year fixed effects. Moderating role of high-tech industries

	(1)	(2)	(3)	(4)	(5)	(6)
	Decoupling	Diversif. (share)	Diversif. (share, non-CHN)	Diversif. (count)	Friendshoring	Friendsh. (non-CHN)
Trade war × chnexp × HT	.084	.051	.037	.016	.029	.122**
	(.066)	(.055)	(.061)	(.022)	(.044)	(.055)
COVID-19 × chnexp × HT	.04	.023	.106	.038	.038	.079
	(.072)	(.064)	(.068)	(.028)	(.05)	(.079)
Russ-Ukra × chnexp × HT	.025	.02	.043	.023	.079	-.012
	(.083)	(.067)	(.064)	(.037)	(.067)	(.081)
Log (total assets)	.035	.163***	.242***	.253***	-.027	-.018
	(.068)	(.047)	(.054)	(.036)	(.048)	(.059)
ROA	.021	-.006	.012	-.018**	.016	.009
	(.028)	(.014)	(.021)	(.007)	(.016)	(.023)
Leverage	-.015	-.002	-.002	-.016	-.009	.015
	(.024)	(.014)	(.015)	(.01)	(.015)	(.019)
Observations	15,409	15,409	14,407	15,409	15,292	13,984
Firms	1,559	1,559	1,482	1,559	1,553	1,457
Within R-squared	0.038	0.008	0.007	0.013	0.005	0.003
R-squared	0.222	0.676	0.684	0.89	0.678	0.646
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-by-year FE	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1*
Source: Authors' own work

Appendix 4. Robustness check: Decoupling alternative variables

	(1) Decoupling (annual) Industry-specific linear trends	(2) Decoupling (annual) Industry-by-year FE	(3) Substitution Industry-specific linear trends	(4) Substitution Industry-by-year FE
Trade war × chnexp	.206***	.24***	.143***	.152***
	(.017)	(.02)	(.02)	(.022)
COVID-19 × chnexp	.125***	.128***	.081***	.075***
	(.019)	(.021)	(.024)	(.027)
Russ-Ukra × chnexp	.117***	.113***	.079***	.076***
	(.017)	(.018)	(.02)	(.021)
Log (total assets)	.035	.029	.001	.008
	(.039)	(.039)	(.047)	(.048)
ROA	.008	.004	.035	.032
	(.022)	(.023)	(.028)	(.028)
Leverage	-.015	-.021	.002	-.002
	(.014)	(.014)	(.018)	(.018)
Observations	15,457	15,409	15,457	15,409
Firms	1,565	1,559	1,565	1,559
Within R-squared	0.007	0.008	0.003	0.003
R-squared	0.055	0.107	0.093	0.139
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry-specific linear trends	Yes	No	Yes	No
Industry-by-year FE	No	Yes	No	Yes

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1*
Source: Authors' own work

Appendix 5. Robustness check: Expanded baseline periods. Main results

Panel A — COVID-19 period relative to 2011–2019 baseline

	(1)	(2)	(3)	(4)	(5)	(6)
	Decoupling	Diversif. (share)	Diversif. (share, non-CHN)	Diversif. (count)	Friendshoring	Friendsh. (non-CHN)
COVID-19 × chnexp	.324***	.079***	-.015	.004	.062***	-.051**
	(.027)	(.018)	(.021)	(.011)	(.018)	(.025)
Log (total assets)	.043	.163***	.239***	.254***	-.029	-.02
	(.066)	(.045)	(.051)	(.035)	(.046)	(.058)
ROA	.036	-.003	.017	-.015**	.018	.017
	(.028)	(.013)	(.021)	(.007)	(.015)	(.022)
Leverage	-.009	-.001	-.005	-.018*	-.012	.015
	(.024)	(.014)	(.015)	(.01)	(.015)	(.018)
Observations	15,457	15,457	14,451	15,457	15,341	14,026
Firms	1,565	1,565	1,487	1,565	1,559	1,462
Within R-squared	0.016	0.007	0.005	0.013	0.002	0.002
R-squared	0.159	0.662	0.669	0.886	0.659	0.629
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-specific linear trends	Yes	Yes	Yes	Yes	Yes	Yes

Panel B — Russia–Ukraine war period relative to 2011–2021 baseline

	(1)	(2)	(3)	(4)	(5)	(6)
	Decoupling	Diversif. (share)	Diversif. (share, non-CHN)	Diversif. (count)	Friendshoring	Friendsh. (non-CHN)
Russ-Ukra × chnexp	.109***	.084***	-.012	.016	-.05**	-.066***
	(.027)	(.018)	(.019)	(.013)	(.022)	(.023)
Log (total assets)	.046	.163***	.239***	.254***	-.029	-.02
	(.068)	(.046)	(.051)	(.035)	(.046)	(.058)
ROA	.039	-.002	.017	-.015**	.018	.017
	(.029)	(.013)	(.021)	(.007)	(.015)	(.022)
Leverage	-.003	0	-.005	-.018*	-.01	.014
	(.025)	(.014)	(.015)	(.01)	(.015)	(.018)
Observations	15,457	15,457	14,451	15,457	15,341	14,026
Firms	1,565	1,565	1,487	1,565	1,559	1,462
Within R-squared	0.002	0.005	0.005	0.013	0.001	0.002
R-squared	0.147	0.661	0.669	0.886	0.658	0.628
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-specific linear trends	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors are in parentheses
*** *p<.01,* ** *p<.05,* * *p<.1*
Source: Authors' own work

Appendix 6. Robustness check: Expanded baseline periods. Moderating role of high-tech industries

Panel A — high-tech interaction, COVID-19 period relative to 2011–2019 baseline

	(1)	(2)	(3)	(4)	(5)	(6)
	Decoupling	Diversif. (share)	Diversif. (share, non-CHN)	Diversif. (count)	Friendshoring	Friendsh. (non-CHN)
COVID-19 × chnexp × HT	.054	.005	.077	.039	.018	.025
	(.063)	(.051)	(.057)	(.024)	(.042)	(.067)
Log (total assets)	.042	.163***	.24***	.255***	-.03	-.019
	(.067)	(.045)	(.051)	(.035)	(.046)	(.058)
ROA	.035	-.003	.016	-.015**	.017	.017
	(.028)	(.013)	(.021)	(.007)	(.015)	(.022)
Leverage	-.01	-.001	-.005	-.018*	-.013	.015
	(.024)	(.014)	(.015)	(.01)	(.015)	(.018)
Observations	15,457	15,457	14,451	15,457	15,341	14,026
Firms	1,565	1,565	1,487	1,565	1,559	1,462
Within R-squared	0.016	0.007	0.007	0.013	0.005	0.002
R-squared	0.159	0.662	0.670	0.886	0.659	0.629
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-specific linear trends	Yes	Yes	Yes	Yes	Yes	Yes

Panel B — high-tech interaction, Russia-Ukraine war period relative to 2011–2021 baseline

	(1)	(2)	(3)	(4)	(5)	(6)
	Decoupling	Diversif. (share)	Diversif. (share, non-CHN)	Diversif. (count)	Friendshoring	Friendsh. (non-CHN)
Russ-Ukra × chnexp × HT	.056	.019	.025	.016	.085	-.06
	(.076)	(.051)	(.049)	(.029)	(.055)	(.062)
Log (total assets)	.046	.163***	.238***	.254***	-.028	-.018
	(.068)	(.045)	(.051)	(.035)	(.046)	(.058)
ROA	.038	-.002	.018	-.015**	.017	.017
	(.028)	(.013)	(.021)	(.007)	(.015)	(.022)
Leverage	-.003	0	-.005	-.018*	-.011	.014
	(.025)	(.014)	(.015)	(.01)	(.015)	(.018)
Observations	15,457	15,457	14,451	15,457	15,341	14,026
Firms	1,565	1,565	1,487	1,565	1,559	1,462
Within R-squared	0.003	0.005	0.005	0.013	0.003	0.002
R-squared	0.147	0.661	0.669	0.886	0.659	0.628
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-specific linear trends	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1*
Source: Authors' own work

Appendix 7. US goods imports from Canada, total and overland, 2011–2024

Year	(1) Canada imports	(2) World imports	(3) Canada share	(4) Overland Canada exports share	(5) Overland Canada as share of US imports
2011	315324.8	2207954.3	14.28	65	9.28
2012	324263	2276267.1	14.25	66	9.40
2013	332503.6	2267986.7	14.67	64.9	9.51
2014	349286.1	2356356.1	14.82	63.7	9.45
2015	296305.1	2248811.4	13.18	71.5	9.42
2016	277719.8	2186785.9	12.7	75.3	9.56
2017	299065.4	2339591.3	12.78	71.5	9.14
2018	318574.8	2536145.3	12.56	70.6	8.87
2019	318588.8	2491699.6	12.79	69.7	8.91
2020	270025.5	2331477.2	11.58	72.8	8.43
2021	357274.7	2828515.5	12.63	67.6	8.54
2022	437417.6	3239732.9	13.50	61.9	8.36
2023	418006.2	3076552.3	13.59	66.6	9.04
2024	411771.6	3263893.3	12.62	65.9	8.31

(1) Canada imports: US imports from Canada in millions of USD
(2) World imports: US imports from the world in millions of USD
(3) Canada share: Percentage of US imports from Canada
(4) Overland Canada exports share: Percentage of Canada exports to US shipped by truck or rail
(5) Overland Canada as share of US imports: Percentage of US imports arriving overland from Canada, computed as (3) × (4)
Sources: columns (1)–(3), US Census Bureau (https://www.census.gov/foreign-trade/balance/c0015.html); column (4), Statistics Canada, Table 12-10-0177-01 (https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1210017701), monthly data aggregated to calendar years by the authors.
Source: Authors'own work