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Geopolitical Risk and Supply Chain Diversification: Evidence from Japanese multinational firms*

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Abstract

Utilizing comprehensive parent-affiliate matched data on Japanese multinational firms, this study investigates how geopolitical risks affect global supply chain configurations, with a focus on East and Southeast Asia during the period 2009–2022. We construct firm-level exposure to geopolitical risk in China using data on trade and foreign direct investment. First, Japanese multinational firms tend to respond to geopolitical shocks by diversifying their supply chains away from China and toward the Association of Southeast Asian Nations' (ASEAN) economies. This response is particularly pronounced among firms that depend heavily on imported inputs from China or maintain substantial production operations there. Second, such diversification typically does not entail drastic within-firm relocation ("friend-shoring") of supply chains. Third, Japanese multinational firms tend to increase their capital investment in Japan while maintaining their existing production bases in China. These results suggest that firms favor a strategy of supply chain diversification—rather than outright relocation / reshoring or abrupt decoupling—as a means of mitigating geopolitical risks.

Keywords: Geopolitical risk; global supply chains; multinational firms; diversification; reshoring

JEL classification: F10; F14

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"We are seeing a range of geopolitical risks rise to prominence, and it's appropriate for American businesses to be thinking about what those risks are.'"

— U.S. Secretary of the Treasury Janet Yellen, December 1, 2022[6]

"Overseas production in countries that may be affected by geopolitical risks (due to China-Taiwan tensions) cannot be left unattended. Either move it to a safer country or return it to Japan."

— Chairman and CEO of Canon Fujio Mitarai, October 26, 2022[7]

1. Introduction

Supply chain disruptions and rising geopolitical tensions in recent years have brought the risks and potential benefits and costs of geoeconomic fragmentation to the centre of the policy debate (International Monetary Fund, 2023). Both companies and policymakers are increasingly considering strategies to enhance supply chain resilience by moving production home or to safer/trusted countries ("friend-shoring"). Empirical evidence shows that higher geopolitical risk foreshadows lower investment and employment and is associated with higher disaster probability and larger downside risks to GDP growth (Caldara and Iacoviello, 2022). Moreover, geopolitical tensions influence the pricing of risky assets, cash holdings, and alter the cross-border flow of capital (Bussy and Zheng, 2023; Duong, Ishikawa, Nishide, Rhee, and Sasahara, 2025). In a similar vein, such tensions can significantly shape trade patterns and global supply chains through firm-level decisions and government interventions. Understanding the international ramifications of geopolitical risks is therefore essential for both academic research and evidence-based policymaking.

How do geopolitical risks affect supply chains? How do firms respond to heightened geopolitical tensions? Will multinational firms diversify or relocate their supply chains? Despite growing policy and academic interest, these questions remain largely underexplored. To address this gap, we use a newly constructed parent–affiliate matched dataset of Japanese multinational firms to examine the impact of geopolitical risk on regional supply chains in East and Southeast Asia over the period 2009–2022. Specifically, we investigate how multinational firms' exposure to China-related geopolitical risk influences their decisions regarding their supply chain diversification,

[6] "Yellen says appropriate for U.S. firms to assess China geopolitical risks," December 1, 2022, Reuter. https://www.reuters.com/markets/us/yellen-says-us-firms-should-be-mindful-china-taiwan-geopolitical-risks-2022-11-30/

[7] "Canon Chairman Fujio Mitarai highlights "reshoring" of factories amid concerns over geopolitical risks," December 27, 2022, Asahi Shimbun. https://www.asahi.com/articles/ASQBV7W7KQBVULFA023.html (in Japanese)

relocation, and reshoring.[1] To capture firm-specific exposure to geopolitical risk in China, we construct novel variables that capture each firm's reliance on imported inputs from China and the presence of foreign affiliates in China. The premise is that firms with stronger linkages to China are more vulnerable to disruptions when geopolitical risks escalate. In this study, we focus exclusively on Japanese manufacturing affiliates located in China and ASEAN, given their critical role in regional supply chains and their heightened vulnerability to geopolitical risks. Geographically, Japanese foreign affiliates in Asia accounted for 67.8% of all overseas affiliates. Among them, the ASEAN-10 countries and China represented 29.7% and 28.3%, respectively, underscoring the strategic importance of these regions for Japan's manufacturing footprint abroad.[2]

Our dataset is rich and unique: for each foreign manufacturing affiliate located in China, the Association of South East Asian Nations (ASEAN), and the rest of the world, we have information on the founding year and month, operation status, and capital investment. For each parent firm (headquarter) in Japan, we have detailed information on domestic capital investment and the number of domestic manufacturing affiliates. This allows us to rigorously quantify how geopolitical shocks involving China influence the global operations and strategic responses of multinational firms.

We find that surges in geopolitical risk in China significantly increase the probability that Japanese multinational firms will diversify their supply chains—both in terms of import sourcing and overseas production. These effects are especially pronounced for firms that are highly dependent on imported inputs from foreign affiliates located in China and maintain substantial production operations there. However, we find limited evidence of complete within-firm production relocation from China to ASEAN. Instead, Japanese multinationals appear to adopt a strategy of diversification rather than outright relocation. Moreover, our results indicate that Japanese firms tend to increase their domestic capital investment in Japan without shutting down their production bases in China. This pattern suggests that firms are managing geopolitical risk primarily through diversification strategies—such as "China Plus One"—rather than through full-

[1] As the term "friend-shoring" carries explicit political connotations, we instead use the term "relocation" to describe the shift of supply chains from China to ASEAN countries. More importantly, the term "friend-shoring" is not commonly used or widely accepted among Japanese companies. In contrast, Alfaro and Chor (2023) document a significant increase in the frequency of terms such as "friend-shoring," "nearshoring," and "reshoring" in the earnings call transcripts of U.S. firms after 2017.

[2] ASEAN-10 countries include Brunei, Cambodia, Indonesia, Laos, Malysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam.

scale reshoring or relocation. In this context, supply chain diversification serves as a risk mitigation tool that enables multinational firms to hedge against geopolitical shocks while maintaining operational continuity in China.

Our study contributes to the emerging literature on geoeconomics and the economic consequences of geopolitical risks.[3] Notably, Caldara and Iacoviello (2022) develop a news-based measure of adverse geopolitical events and associated risks, known as Geopolitical Risk (GPR) Index. Their study shows that heightened geopolitical risks foreshadow lower investment and employment. Using local newspapers and textual data, Bondarenko, Lewis, Rottner, and Schüler (2024) and Ito, Lim, and Zhang (2025) construct measures of geopolitical risk in Russia and China, respectively, and examine their impacts on economic activity. Drawing on country- and industry-level data, Bussy and Zheng (2023) show that the rising geopolitical risks significantly discourage foreign direct investment (FDI).[4] Furthermore, Gopinath, Gourinchas, Presbitero, and Topalova (2025) find significant declines in trade, FDI, and portfolio flows between countries in geopolitically distant blocs since the onset of the war in Ukraine, relative to flows between countries in the same bloc. Focusing on the phenomenon of "friend-shoring", Grover and Vézina (2025) use project-level foreign investment data to show that firms from advanced Western economies are increasingly directing their investments toward politically aligned countries.

Our study is also closely related to the growing body of literature examining the effects of trade policy and trade conflicts on international trade, FDI, and global supply chains. Flaaen, Hortacsu, and Tintenot (2020) find that the U.S. antidumping duties against the Republic of Korea and China accompanied downward or minor price movements and production relocation to other export platform countries. Regarding the impacts of US trade war, Alfaro and Chor (2023) document a reduction in direct U.S. sourcing from China, with import shares rising in low-wage locations (notably Vietnam) and nearshoring alternatives (particularly Mexico). Fajgelbaum, Goldberg, Kennedy, Khandelwal, and Taglioni (2024) show that the US-China trade war created net export opportunities rather than simply shifting trade across destinations: many "bystander" countries grew their exports of tariffed products into the rest of the world. Furthermore, Garred and Yuan

[3] Mohr and Trebesch (2025) take a broad view and define geoeconomics as the study of the interlinkages between geopolitics and economics.

[4] Building on this line of research, Duong, Ishikawa, Nishide, Rhee, and Sasahara (2025)—using the same firm-level Japanese dataset as this study—demonstrate that multinational firms exposed to geopolitical risk through FDI reduce asset-side variables such as cash holdings and capital expenditures in response. More broadly, our study is also related to how policy uncertainty affects international trade (e.g. Handley and Limao, 2017), capital flows (e.g. Julio and Yook, 2016), and FDI (e.g. Choi, Furceri, and Yoon, 2021; Jardet, Jude, and Chinn, 2023).

(2025) demonstrate that, following the US-China trade war, Chinese manufacturing investment and Chinese-produced parts have increasingly flowed to third-country "winners" who have simultaneously increased their US market share.[5]

This study makes three key contributions to the literature. First, while previous research on geopolitical risks and trade war has primarily examined their effects on investment, employment, trade, and FDI, our study shifts the focus to firm-level supply chains. We examine how multinational firms respond to geopolitical tensions through strategic adjustments, including relocation and diversification. Second, whereas most existing studies rely on aggregate-level data—such as product-level or country-level trade and FDI statistics—we are, to the best of our knowledge, the first to utilize firm-level data to analyze the impacts of geopolitical risk on a wide range of firm behaviors, including market entry, exit, diversification, relocation, and reshoring. Third, in contrast to earlier studies that measure firm-level exposure to geopolitical risk using textual analysis of financial statements or earnings calls, we develop a novel measure of firm-specific exposure to China-related geopolitical risk. This measure combines a widely used geopolitical risk index with firm-level information on import dependence on China and the presence of foreign affiliates in China. This approach allows us to more precisely capture Japanese multinational firms' vulnerability to geopolitical tensions specifically involving China.[6]

The remainder of the paper is structured as follows. Section 2 introduces the conceptual framework that underpins our empirical analysis. Section 3 describes the data sources and presents descriptive statistics. Section 4 outlines the empirical specification and defines the variables used in the analysis. Section 5 discusses the main empirical results, while Section 6 provides robustness checks to validate our findings. Finally, Section 7 concludes with a summary of key insights and implications.

2. Conceptual Framework

To guide our empirical analysis, we present a simple conceptual framework that considers the impact of geopolitical risk on supply chain decisions from the perspective of a multinational firm.[7]

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[5] Luo and Wang (2024) also find that the U.S. firms tend to establish supply chain relations with third country firms deeply integrated into Chinese supply chain after 2018.

[6] Similarly, Duong, Ishikawa, Nishide, Rhee, and Sasahara (2025) construct firm-level exposures to global geopolitical risk by leveraging GPR Index and firm-level FDI and trade, examining the effects on cash holding and capital investment.

[7] This framework is based on Freund, Mattoo, Mulabdic, and Ruta (2022) and Ruta (2022). They consider the impact of natural disasters (the 2011 earthquake in Japan) and the Ukraine war on the reconfiguration of supply chains.

Suppose a Japanese parent firm imports critical inputs from its affiliate located in a foreign country (e.g., China), and an increase in geopolitical risk creates security concerns surrounding this supply chain. In response, the firm must weigh the costs and benefits of relocating its supply chain—such as moving its production base from China to another country, such as a member of ASEAN or back to Japan. The potential benefit of relocation rises with the production scale of the affiliate in China, as firms more heavily dependent on Chinese production are more vulnerable to supply disruptions.

However, relocation entails significant costs, including investment in new facilities, the search and setup of new supplier relationships, and potentially higher operating costs in the new location.[8] Two primary factors influence the relocation decision: (1) the per-unit cost difference, which captures differences in wages, infrastructure, and operational efficiency across countries; and (2) the per-unit insurance difference, which captures the insurance cost that a firm must pay to cover the risk of supply chain disruption due to geopolitical shocks. If the geopolitical risk in China rises substantially, the perceived insurance value of relocating production to a less risky country increases. However, if the cost differential is large—e.g., if China remains significantly cheaper to operate in—the firm may choose to diversify instead of fully relocating. This framework helps clarify why firms may adopt varying strategies such as diversification, partial relocation, or reshoring, depending on their specific exposure to risk and cost structure.

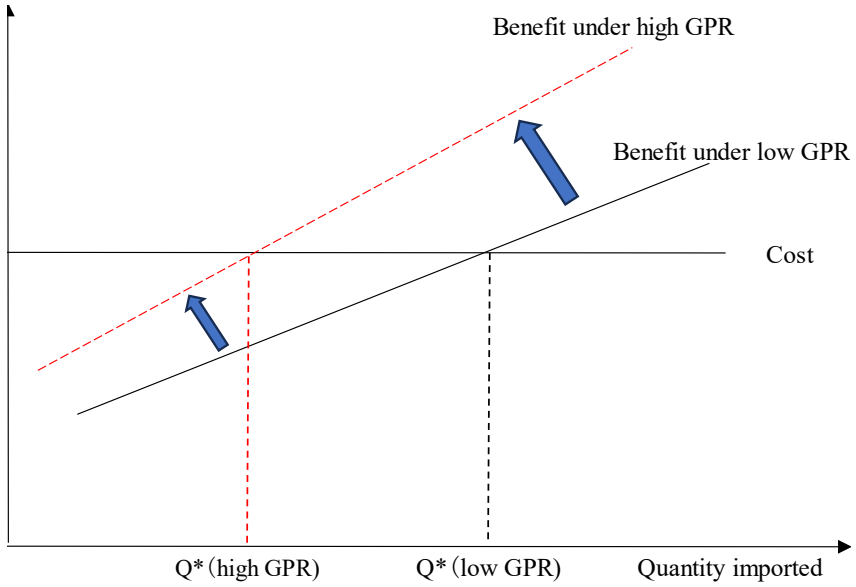
As illustrated in Figure 1, a surge in geopolitical risk increases the per-unit insurance premium differential between the current location (China) and alternative low-risk locations (e.g., ASEAN or Japan), thereby steepening the benefit schedule of relocation. This implies that multinational firms with higher exposure to geopolitical risk—measured by the degree to which they source from China—must effectively pay more for insurance to hedge against potential supply chain disruptions. As the perceived risk of maintaining operations in China rises, the relative attractiveness of relocating production to a safer location increases.[9] In the new equilibrium, where geopolitical risk is high, only those firms with exposure above a threshold level, denoted as Q^*(high GPR), find it optimal to relocate. By contrast, firms with lower exposure—those sourcing less than Q^*(high GPR)—lack sufficient incentive to move and thus remain in China even after the shock. This framework helps explain the observed pattern of selective relocation among Japanese multinationals, where diversification and partial shifts in supply chains occur

[8] Grossman, Helpman, and Redding (2024) estimate that the US tariffs on China resulted in a welfare loss of 0.12% of GDP, with a substantial contribution from changes in input sourcing and search costs.

[9] The assumption is that geopolitical shocks do not affect other factors, such as the per-unit cost differences between locations and relocation costs.

rather than full-scale relocation.

Figure 1. Benefits and costs of switching importing source under geopolitical risk



Source: Authors' compilation based on Ruta (2022).

An increase in the perceived riskiness of an import source raises the expected loss associated with sourcing from that location, thereby increasing the incentive to switch to alternative suppliers (Ruta, 2022). However, the perceived level of geopolitical risk is inherently difficult to observe and quantify. Prior studies offer indirect evidence: for example, Caldara and Iacoviello (2022) find that investment declines more sharply in industries that are more exposed to aggregate geopolitical risks. At the firm level, Chen, Senga, and Zhang (2021) show that firms that have exposure to international businesses either through international trade or FDI have both higher expected sales and subjective uncertainty.

In addition, survey evidence from more than 15,000 Japanese companies conducted by the Research Institute of Economy, Trade and Industry (RIETI) indicates that the proportion of firms reporting that "War, Conflicts, and Geopolitical Risks in China" affect their business plans rose markedly from 10.1% in 2017 to 19.6% in 2021 (Zhang, 2021). Building on these insights, this study hypothesizes that firms exposed to geopolitical risk—particularly through their dependence on imported inputs from China or overseas production located in China—are more likely to respond by diversifying their supply chains or relocating production to alternative destinations such as ASEAN or Japan.

3. Data

3.1 Geopolitical Risk (GPR) Index

The data for the Geopolitical Risk (GPR) Index used in this study is obtained from the publicly available dataset constructed by Caldara and Iacoviello (2022). The GPR Index quantifies geopolitical risks based on the frequency of newspaper articles that discuss geopolitical tensions, including threats, actual occurrences, and escalations of adverse events such as wars and terrorism, as well as any tensions among states or political actors that disrupt the peaceful conduct of international relations. [10] A recent and prominent example of such geopolitical tension is the US–China trade war. While the trade war directly affected firms operating within China and the United States, as well as those dependent on imports or sales linked to these markets, its ramifications have extended well beyond bilateral trade (Sun, Tao, Yuan, and Zhang, 2019).[11] This underscores the need to examine how geopolitical risks—regardless of their geographical origin—reshape the strategic decisions of multinational firms across regions.

Figure 2 visualizes the evolution of the GPR Index from 2005 to 2024 for China, Japan, and a group of five ASEAN countries (Indonesia, Malaysia, Philippines, Thailand, and Vietnam).[12] The indices are normalized to 1 in 2005, allowing for cross-country comparison over time. The GPR Index for China shows a significant upward trend, especially after 2017, peaking around 2022. This likely reflects rising geopolitical tensions in the region, including trade frictions with the US, and tensions over Taiwan and the South China Sea. This period also saw growing calls from policymakers—such as U.S. Treasury Secretary Janet Yellen—for firms to engage in "friend-shoring" as a strategy to reconfigure supply chains in response to rising geopolitical tensions. [13] Japan's GPR Index also rises, though at a somewhat slower pace than China's. Notable increases are observed around 2018 and 2022, which coincide with key regional and global geopolitical developments (e.g., the US-China trade war, Russia-Ukraine war). In contrast, the average GPR Index for the ASEAN-5 remains relatively low and stable throughout the period, though it

[10] For 44 advanced and emerging countries, Caldara and Iacoviello (2022) calculate the country-specific index by counting the monthly share of newspaper articles that both (1) meet the criterion for inclusion in the GPR Index and (2) mention the name of the country or its major cities. Each index is expressed as a monthly share of newspaper articles. The resulting indices capture the U.S. perspective on risks posed by, or involving, the country in question.

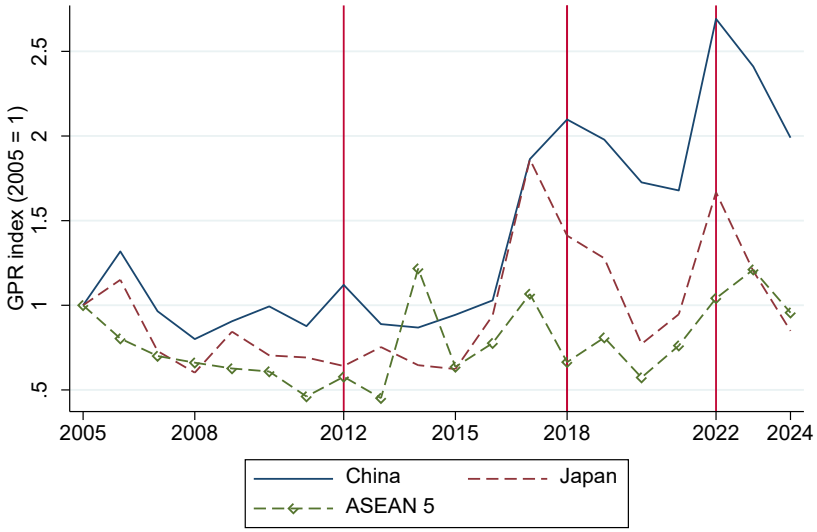
[11] Using micro-data on the foreign affiliates of Japanese multinational corporations, Sun, Tao, Yuan, and Zhang (2019) show that Chinese affiliates—particularly those with high exposure to trade with North America—experienced notable declines in sales following the onset of the US-China trade war, relative to affiliates in other Asian countries.

[12] GPR indices for other ASEAN countries are not available.

[13] "Remarks by Secretary of the Treasury Janet L. Yellen on Way Forward for the Global Economy," The White House, 13 April 2022. https://home.treasury.gov/news/press-releases/jy0714

displays occasional spikes (e.g., in 2014 and 2022), suggesting a more insulated or less directly confrontational geopolitical stance relative to China and Japan. These significant differences in geopolitical risk levels across China, Japan, and ASEAN countries provide motivation for our analysis and reinforce the conceptual framework outlined in the previous section.

Figure 2. Geopolitical risks in China, Japan, and some ASEAN countries



Note: The figure displays the average GPR indices for China, Japan, and five ASEAN countries (Indonesia, Malysia, Philippines, Thailand, and Vietnam). We compute the annual average of the original monthly GPR Index for each fiscal year. Indices are normalized to 1 in 2005. Vertical red lines indicate three key years associated with major geopolitical shocks: 2012 (Senkaku/Diaoyu Islands dispute between China and Japan), 2018 (onset of the US–China trade war), and 2022 (Russia's invasion of Ukraine). *Source:* Authors' compilation based on Caldara and Iacoviello (2022), publicly available at https://www.matteoiacoviello.com/gpr.htm

3.2 Multinational Firms Data

Our primary data source is the *Basic Survey on Overseas Business Activities* (BSOBA), conducted annually by Japan's Ministry of Economy, Trade and Industry (METI). This mandatory survey is based on self-reported forms submitted by Japanese parent firms and their foreign affiliates at the end of each fiscal year. Separate questionnaires are used for parent firms and their affiliates. The parent-firm survey collects information on domestic operations, including sales, employment, and industry classification. In contrast, the affiliate survey captures rich details on overseas affiliates, including their sales, purchases, employment, capital investment, geographic location, and industry affiliation. The survey covers both manufacturing and non-manufacturing affiliates. As

of the end of fiscal year 2022, the total number of overseas affiliates reported in the BSOBA was 24,415, comprising 10,433 in the manufacturing sector and 13,982 in non-manufacturing. Manufacturing affiliates represented 42.7% of the total.

The survey provides detailed information on the founding year and operational status of each foreign affiliate, enabling us to precisely define affiliate entry and exit (divestment) events. Exit events are categorized into three types: (1) dissolution, which refers to the complete termination of operations whereby the Japanese firm's equity share falls to 0% due to liquidation, bankruptcy, or similar events; (2) withdrawal, which includes business sales, absorption or mergers, consolidations, or relocation to another country or region; and (3) decline in control share, defined as a reduction in the Japanese parent's equity stake to between 0% and 10%, indicating a loss of effective control. These classifications allow for a granular analysis of exit behavior across different geopolitical contexts. Moreover, the survey collects disaggregated data on each affiliate's total sales and sourcing by major region. Specifically, affiliates report sales by destination—local market, Japan, and third countries—and sourcing by origin—local purchases, imports from Japan, and imports from other countries. This rich, affiliate-level panel dataset enables us to track patterns of entry, exit, and potential relocation of Japanese foreign affiliates across China, ASEAN, and other regions, before and after episodes of heightened geopolitical risk.

To obtain detailed information on the importing behavior and domestic activities of Japanese parent firms, we utilize the *Basic Survey of Japanese Business Structure and Activities* (BSJBSA), an annual firm-level survey also conducted by the METI. This mandatory survey targets large firms across a wide range of industries—defined as those employing more than 50 workers and possessing total assets exceeding 30 million Japanese yen—and collects extensive data on both domestic and international business operations.

A notable feature of the BSJBSA is its disaggregation of trade data. Firms report their import and export values by major region—including China, non-China Asia, North America, Europe, the Middle East, Africa, and the rest of the world—as well as by transaction type, distinguishing between intra-firm and arm's-length trade. This enables us to construct firm-specific measures of geopolitical risk exposure by identifying firms that rely heavily on imported inputs from China and/or generate significant overseas sales through affiliates in China. Crucially, the BSJBSA also provides rich information on domestic business activities, such as capital investment, the number of domestic and foreign manufacturing affiliates. These variables are used to measure firms' reshoring behavior, which we define in detail below.

To conduct our empirical analysis, we construct an original panel dataset on multinational firms by merging the parent firm data from BSJBSA with the overseas affiliate data from the BSOBA. They are linked using a unique firm identifier, enabling consistent firm-level tracking over time. The resulting panel dataset covers Japanese multinational firms over fiscal years 2009 to 2022, comprising approximately 6,500 firm-level observations per year. Among these, roughly 2,500 firms maintain at least one manufacturing affiliate located in China. This rich dataset allows us to analyze firm dynamics—such as foreign affiliate activity, capital investment, and supply chain decisions—in response to changes in geopolitical risk.

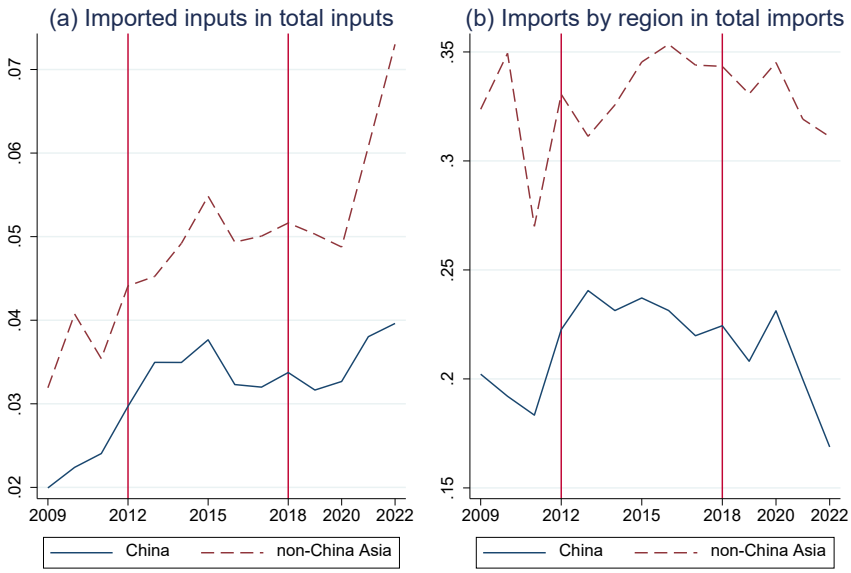
3.3 Descriptive Evidence

This subsection presents the descriptive results on the trade and FDI of Japanese multinational firms, with a focus on China and ASEAN region.

Figure 3 illustrates the evolution of import patterns by Japanese multinational firms from China and non-China Asia over the period 2009–2022. Panel (a) plots the share of imported inputs in total inputs, while Panel (b) presents the regional composition of total imports. A notable divergence in sourcing trends emerges following the 2012 Senkaku/Diaoyu Islands dispute between Japan and China, marked by the first vertical line in the figure. Specifically, while imports from China as a share of total inputs increased moderately from approximately 2% in 2009 to 4% in 2022, this growth plateaued between 2014 and 2019, suggesting a period of relative stagnation in Chinese input sourcing. In contrast, Japanese multinational firms increased their reliance on non-China Asia steadily throughout the sample period. By 2022, imports from non-China Asia accounted for over 7% of total inputs, indicating an ongoing shift toward regional diversification.

Panel (b) further confirms this trend: China's share of total imports fell from roughly 20% in 2009 to under 15% in 2022, while non-China Asia consistently maintained a higher share, fluctuating between 30% and 35%. Notably, the gap between China and non-China Asia widened further after the 2018 US–China trade war, marked by the second vertical line. This suggests that geopolitical tensions beyond the Japan–China context — particularly US policy actions — may have prompted Japanese multinational firms to further diversify their supply chains away from China. The persistent and growing divergence after both the 2012 and 2018 events indicates a gradual but significant realignment of sourcing strategies toward other Asian economies, potentially as a risk mitigation response to escalating geopolitical uncertainty.

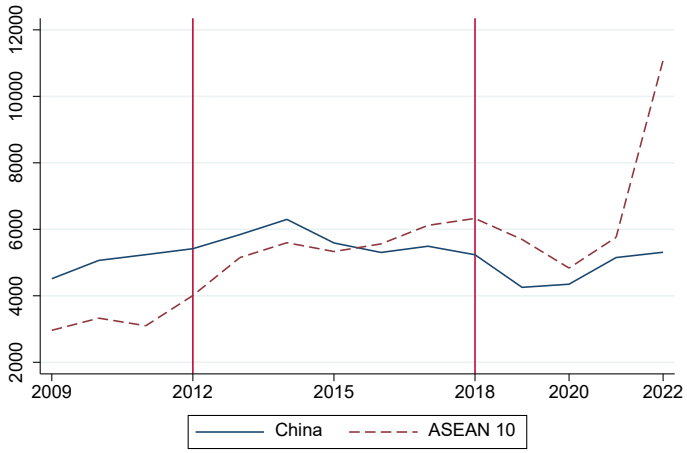
Figure 3. Imports from China and the rest of Asia



Note: Panel (a) shows the regional composition of imported inputs as a share of total inputs while panel (b) illustrates the regional breakdown of imports as a share of total imports among Japanese multinational firms. The first vertical red line marks the 2012 China–Japan Senkaku/Diaoyu Islands dispute, and the second vertical red line marks the onset of the US–China trade war in 2018. *Source:* Authors' compilation based on the BSJBSA, METI, Japan.

Figure 4 plots the export values of Japanese foreign affiliates in China and ASEAN-10 countries to Japan between 2009 and 2022. During the early period (2009–2015), exports from China steadily increased, surpassing those from ASEAN. However, this trend reverses after 2016. In the aftermath of the 2012 Senkaku/Diaoyu Islands dispute, the gap in export values between China and ASEAN narrows considerably. By 2018—coinciding with the escalation of the US–China trade war—exports from ASEAN countries surpass those from China, marking a significant turning point in the geographic composition of Japan-bound exports from Japanese foreign affiliates. This divergence becomes especially pronounced after 2020, suggesting a structural shift in Japanese firms' overseas production strategies.

Figure 4. Foreign affiliates' exports to Japan: China vs ASEAN



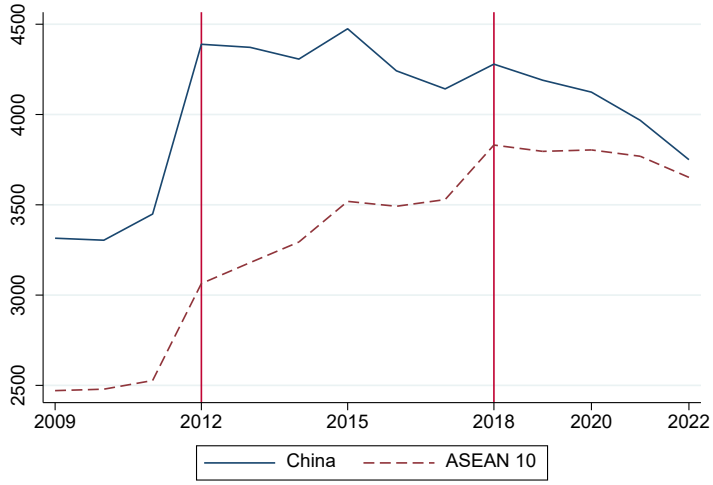
Note: The figure displays the export values from Japanese foreign affiliates located in China and the ASEAN-10 countries to Japan. Export values are in million Japanese yen. The first vertical red line marks the 2012 China–Japan Senkaku/Diaoyu Islands dispute, and the second vertical red line marks the onset of the US–China trade war in 2018. *Source:* Authors' compilation based on the BSOBA, METI, Japan.

Figure 5 displays the evolution of the number of Japanese foreign manufacturing affiliates in China and ASEAN from 2009 to 2022. Prior to the 2012 Senkaku/Diaoyu Islands dispute, both regions exhibited a broadly parallel upward trend, reflecting the continued international expansion of Japanese multinationals across Asia. However, a distinct divergence begins to emerge after 2012, coinciding with heightened geopolitical tensions between Japan and China. In China, the number of manufacturing affiliates peaked around 2014–2015, followed by a gradual but sustained decline, falling to 3,750 affiliates by 2022.[14] In contrast, ASEAN countries experienced a steady and uninterrupted increase in affiliate numbers after 2012, narrowing the gap with China and reaching 3,652 affiliates by 2022. This near-convergence of affiliate counts across the two regions underscores a strategic rebalancing of production networks by Japanese multinationals. This shift is consistent with the so-called "China Plus One" strategy, wherein firms diversify production bases beyond China—often into Southeast Asia—to mitigate geopolitical and operational risks. The divergence in affiliate trends also suggests that Japanese firms increasingly perceive ASEAN as a more stable and politically neutral alternative in response to rising tensions

[14] Chen, Senga, Sun, and Zhang (2022) show that after the escalation of the Senkaku/Diaoyu Islands dispute between China and Japan in 2012, Japanese foreign affiliates in China experienced a protracted decline in sales and investment. As a result, Japanese firms pursued the so-called "China Plus One" business strategy to avoid investing only in China and diversify business into other countries.

not only between Japan and China but also between the US and China. As a result, regional diversification appears to be an active and growing dimension of risk management among Japanese multinationals.

Figure 5. Number of foreign manufacturing affiliates: China vs ASEAN



Note: The figure displays the number of Japanese foreign manufacturing affiliates located in China and the ASEAN-10 countries. The first vertical red line marks the 2012 China–Japan Senkaku/Diaoyu Islands dispute, and the second vertical red line marks the onset of the US–China trade war in 2018. *Source:* Authors' compilation based on the BSOBA, METI, Japan.

In contrast to Figure 5, which presents broader trends, Appendix Figure A1 illustrates the number of Japanese foreign manufacturing affiliates located in the ASEAN-10 countries, conditional on parent firms maintaining at least one manufacturing affiliate in China. The figure reveals a more gradual yet persistent increase in the number of affiliates in ASEAN-10 countries, particularly after the 2012 Senkaku/Diaoyu Islands dispute. This suggests that while China continued to serve as a core manufacturing hub for Japanese multinationals, geopolitical tensions likely incentivized firms to adopt a diversification strategy. Rather than fully relocating operations, firms appeared to expand incrementally into ASEAN markets, thereby reducing over-reliance on China while maintaining their existing production bases.

Figure 6 illustrates the evolution of Japanese manufacturing affiliates' exit and entry patterns in China and ASEAN from 2009 to 2022, shedding light on how geopolitical tensions and trade shocks have influenced firms' overseas investment decisions. In Panel (a), we observe a notable divergence in exit rates following the 2012 Senkaku/Diaoyu Islands dispute. Prior to this event,

exit rates in China and ASEAN were relatively comparable. However, from 2013 onward, the exit rate in China consistently hovered around 5%–6%, indicating persistent pressures to divest or scale down operations. [15] In contrast, ASEAN countries exhibited a more stable and lower exit rate, generally around 3%, suggesting a more favorable or less risky environment for continued operations. Panel (b) focuses on entry dynamics, showing each region's share of new affiliate establishments as a percentage of total new entries by Japanese multinationals. In the early part of the sample, China was the dominant destination for new investments. However, its entry share gradually declined after 2012, with a notable acceleration of this trend after the 2018 US–China trade war. In particular, ASEAN's entry share surged past 40% in 2019, temporarily overtaking China. This dramatic reallocation of new investments underscores a strategic pivot toward ASEAN in response to rising trade frictions and geopolitical risk in China.

Figure 6. Entry and exit of foreign affiliates: China vs ASEAN

Note: Panel (a) shows the exit rates of Japanese foreign manufacturing affiliates in China and the ASEAN-10 countries, while panel (b) displays the regional distribution of new entries (entry share). The first vertical red line marks the 2012 China–Japan Senkaku/Diaoyu Islands dispute, and the second vertical red line marks the onset of the US–China trade war in 2018. *Source:* Authors' compilation based on the BSOBA, METI, Japan.

[15] Previous study (e.g., Luo, Si, and Zhang, 2022) supports this pattern, finding that geopolitical tensions and rising labor costs, such as minimum wage hikes, significantly increased the likelihood of Japanese firms withdrawing from China—especially those that were smaller, less productive, or less profitable.

4. Specification and Variables

4.1 Specification

In this section, we the empirical specification and defines the variables used in the analysis. To examine how multinational firms respond to geopolitical risks, we run the following regression:

$$y_{ft} = \alpha_0 + \alpha_1 GPR\_Exposure_{ft}^{China} + FE_f + FE_{it} + FE_{pt} + \varepsilon_{ft} \quad (1)$$

where y_{ft} denotes the outcome variable for multinational parent firm f in fiscal year t. Our outcome variables include: (i) supply chain diversification, (ii) exit from China and entry into ASEAN, (iii) relocation from China to ASEAN, and (iv) reshoring from China to Japan. The main explanatory variable of interest is firm-specific exposure to geopolitical risk in China, which captures the extent to which each firm's operations are vulnerable to geopolitical tensions involving China. Each variable is defined in detail in the subsequent subsection. Note that in our empirical analysis, we aggregate affiliate-level exit and entry to the parent-firm level as entry and exit decisions are made by the parent firm.

The coefficient of interest is α_1 and we expect that it will be positive. Our hypothesis is that relative to firms with less or no reliance on China, firms that rely on imported inputs from foreign affiliates in China or overseas production in China tend to respond to geopolitical shocks by diversifying or relocating their supply chains and production. FE_f , FE_{it}, FE_{pt} are parent-firm fixed effects, industry-year fixed effects, and prefecture-year fixed effects, respectively, to control for unobserved firm heterogeneity (size, management, etc.) and macroeconomic shocks across sectors and regions. The standard errors are clustered at the parent firm level. Our sample period spans fiscal years 2009 to 2022, allowing us to capture both pre- and post-shock dynamics in multinational firms' supply chain strategies in response to rising geopolitical tensions in East and Southeast Asia, especially China.

4.2 Variables

Diversification: We define supply chain diversification along two dimensions: import diversification and production diversification. *Import diversification*: For each parent firm f in year t, we define the binary variable, DIV_imp_{ft}, as equal to 1 if the firm imports inputs from China in year t, did not import from non-China Asia in year $t-1$, but begins importing from non-China Asia in year t, and 0 otherwise. This measure captures the firm's decision to add non-China Asia as an alternative import source alongside continued sourcing from China. *Production diversification:* Similarly, we define a binary variable, DIV_pro_{ft}, which equals 1 if the parent firm operates at least one manufacturing affiliate operating in China in year t, had no

manufacturing affiliate in ASEAN in year $t-1$, but establishes a new manufacturing affiliate in ASEAN in year t; it equals 0 otherwise. This indicator captures diversification of overseas production across multiple host countries.

Entry and exit: We use the binary indicators $Exit\_CHN_{ft}$ and $Entry\_ASEAN_{ft}$ to capture the exit (divestment) from China and new entry into ASEAN by firm f in year t, respectively. *Exit:* We define $Exit\_CHN_{ft}$ as occurring when the foreign affiliate in China reports one of the following operational status: (i) dissolution including liquidation or bankruptcy, (ii) withdrawal due to business sale, merger, or relocation, or (iii) a decline in control share where the total equity share held by Japanese firms falls below 10%. In such cases, the parent firm is considered to have withdrawn its capital investment in that year. We use the information on an affiliate's founding year and month to define entry. *Entry:* $Entry\_ASEAN_{ft}$ is defined using the reported founding year and month of each affiliate. A new affiliate is considered established in year t if it reports a founding date within that year and is located in one of the ASEAN countries. This allows us to identify new production expansion in the region.

Relocation: To capture the possible relocation of supply chains from China to ASEAN, we construct two firm-year-level indicators: one for affiliate-level exit and entry, and one for investment reallocation within firm. *Production relocation from China to ASEAN:* We define the binary variable REL_pro_{ft} as equal to 1 if multinational firm f exits (divests from) China in year t, and establishes a new manufacturing affiliate in an ASEAN country within a three-year window (i.e., in year t, $t-1$, or $t-2$). This window accounts for the time required for relocation, including new investments in physical capital, human resources, regulatory adjustments, and market development. This measure captures production relocation at the extensive margin — the opening and closing of overseas manufacturing bases. *Investment reallocation from Chia to ASEAN:* To account for the possibility that Japanese multinational firms may adjust the scale of existing operations rather than completely divest, we construct a second binary variable, REL_inv_{ft}. This variable equals 1 if the capital investment growth rate of Japanese affiliates in China is negative in both year $t-1$ and year t, and simultaneously, the investment growth rate of affiliates in ASEAN is positive in both year $t-1$ and year t. We interpret this pattern as investment adjustment, indicative of a shift in operational intensity from China to ASEAN. This measure provides suggestive evidence that Japanese multinationals are reallocating resources across regions in response to geopolitical risk.

Reshoring: To capture the reshoring behavior of multinational firms—i.e., the movement of production and investment activities from China back to Japan—we construct two variables to

measure reshoring. *Production reshoring:* We define a binary variable, RES_pro_{ft}, which takes the value of 1 if firm f closes a manufacturing affiliate in China in year t and establishes a new manufacturing affiliate in Japan within a three-year window (i.e., in year t, $t-1$, *or* $t-2$), and 0 otherwise. This variable captures reshoring where firms physically shift their production bases from China back to Japan. *Investment reallocation from China to Japan:* We define RES_inv_{ft} as a dummy variable that takes the value of 1 if the capital investment growth rate of the firm's affiliates in China is negative in both year $t-1$ and year t, while the investment growth rate of the parent firm in Japan is positive over the same period. This measure reflects reshoring where firms downscale their operations in China and simultaneously increase domestic investment.

Firm-specific exposure to geopolitical risk in China: The key explanatory variable is, $GPR\_Exposure_{ft}^{China}$, firm-level exposure to China's geopolitical risk through international trade and FDI. It is constructed as $GPR\_Exposure_{ft}^{China} = \Delta GPR_t^{China} \times Exposure_{ft-1}^{China}$. GPR_t^{China} is the GPR Index for China developed by Caldara and Iacoviello (2022). We compute the annual average of the original monthly GPR Index for each fiscal year. $\Delta GPR_t^{China} = GPR_t^{China} - GPR_{t-1}^{China}$. $Exposure_{ft-1}^{China}$ is the firm's reliance on imported inputs from or production in China, measured in year $t-1$ to mitigate endogeneity concerns. Specifically, we construct four exposure measures as follows:

(i) $Exposure\_imp_{ft-1}^{China} = \frac{\text{Imported inputs from Japanese affiliate(s) in China}_{ft-1}}{\text{Total inputs of parent firm}_{ft-1}}$,

(ii) $Exposure\_imp2_{ft-1}^{China} = \frac{\text{Imported inputs from Japanese affiliate(s) in China}_{ft-1}}{\text{Total imports of parent firm}_{ft-1}}$,

(iii) $Exposure\_sales_{ft-1}^{China} =$

$$\frac{\text{Sales of Japanese affiliate(s) in China}_{ft-1}}{(\text{Total sales of foreign affiliates + parent firm's domestic sales in Japan} - \text{intra-firm trade})_{ft-1}}$$

,[16] and

(iv) $Exposure\_sales2_{ft-1}^{China} = \frac{\text{Sales of Japanese affiliate(s) in China}_{ft-1}}{\text{Total sales of foreign affiliates}_{ft-1}}$.

Table 1 reports the summary statistics for the key outcome and explanatory variables used in the empirical analysis. The outcome variables reflect various dimensions of multinational firms' supply chain adjustments, including diversification, entry, exit, relocation, and reshoring. On average, the incidence of such activities remains relatively low. The mean values for import

[16] We exclude intra-firm exports to avoid double counting. An affiliate in China can sell its output to the Japanese parent firm, which will be an input for the parent firm's domestic output. However, our results without excluding intra-firm trade remain quantitively similar.

diversification and production diversification are 2.6 percent and 1.1 percent, respectively. The average probabilities of exit from China and entry into ASEAN are 1.8 percent and 0.6 percent. The share of firms engaging in production relocation from China to ASEAN is notably small at 0.1 percent, whereas investment-based relocation occurs more frequently, with a mean of 1.2 percent. Reshoring activity from China back to Japan is also limited, with the mean of the reshoring dummy at 0.3 percent and the investment-based reshoring measure at 12.7 percent.

The main explanatory variable is the firm-level exposure to geopolitical risk in China. The annual change in China's geopolitical risk index averages 0.053 with a standard deviation of 0.137. The average shares of imported inputs from affiliates in China in total inputs and in total imports are 6.7 percent and 25.1 percent, respectively. Similarly, the average shares of sales from affiliates in China in global and foreign sales are 8.9 percent and 40.2 percent. These firm-specific exposure measures are used to construct the GPR exposure terms, which exhibit moderate variation, with mean values ranging from 0.042 to 0.056. Collectively, the statistics point to substantial heterogeneity across firms in both their degree of exposure to geopolitical risk and the frequency of supply chain adjustment responses.

Table 1. Summary statistics

Variable	Defination	Mean	Std. dev.
div_imp	Import diversification	0.026	0.159
div_pro	Production diversification	0.011	0.103
exit_china	Exit from China	0.018	0.132
entry_asean	Entry into ASEAN	0.006	0.078
rel_pro	Relocaiton from China to ASEAN	0.001	0.035
rel_inv	Investment adjustment from China to ASEAN	0.012	0.111
res_pro	Reshoring from China to Japan	0.003	0.056
res_inv	Investment adjustment from China to Japan	0.127	0.333
gpr	The change of GPR China	0.053	0.137
importshare	Imported inputs from affiliates in China in total inputs	0.067	0.156
importshare2	Imported inputs from affiliates in China in total imports	0.251	0.364
salesshare	Sales of affiliates in China in global sales	0.089	0.143
salesshare2	Sales of affiliates in China in foreign sales	0.402	0.432
gpr_exp_imp	GPR exposure in terms of imported inputs from affiliates in China in total inputs	0.047	0.128
gpr_exp_imp2	GPR exposure in terms of imported inputs from affiliates in China in total imports	0.052	0.133
gpr_exp_sales	GPR exposure in terms of sales of affiliates in China in global sales	0.049	0.129
gpr_exp_sales2	GPR exposure in terms of sales of affiliates in China in foreign sales	0.056	0.138

Note: The number of observations is 32,652. *Source:* Authors' compilation based on the BSOBA and BSJBSA, METI, Japan.

5. Empirical Results

In this section, we present the main estimation results based on regression equation (1). Note that all coefficients on the GPR exposure variables are normalized to represent the effect of a one-standard-deviation increase in the respective GPR exposure measures on the probability (in percentage) of a multinational firm undertaking a particular supply chain adjustment. This normalization facilitates meaningful comparison of effect sizes across different exposure channels (i.e., global sourcing and overseas production) and across different outcome variables, such as diversification, relocation, and reshoring.

5.1 Geopolitical Risk and Diversification

Table 2 reports the estimation results examining the effect of firm-level exposure to geopolitical risk in China on supply chain diversification by Japanese multinational firms. Columns (1) and (2) show the results for import diversification, while columns (3) and (4) examine production diversification. All specifications include parent-firm fixed effects, industry-year fixed effects, and prefecture-year fixed effects to control for unobserved heterogeneity across firms and macroeconomic shocks across sectors and regions.

The coefficients on GPR exposure variables, i.e., the interaction terms between the changes in China's GPR Index (ΔGPR) and lagged exposure variables, are all positive and statistically significant at the 1% level. In column (1), a one-standard-deviation increase in ΔGPR × lagged import share from affiliates in China in total inputs is associated with a 0.961 percent increase in the probability of import diversification. The magnitude increases to 1.389 percent in column (2) when exposure is measured as import share of affiliates in China in total imports.

Turning to production diversification, column (3) shows that a one-standard-deviation increase in ΔGPR × lagged sales share of affiliates in China (in global sales) leads to a 1.552 percent increase in the probability of establishing new production in ASEAN. The effect is even stronger in column (4), where the exposure variable is based on China's share in foreign sales. Overall, these results indicate that firms more exposed to geopolitical risks through trade and production linkages with China are significantly more likely to diversify their supply chains, either by adjusting their import sources or by establishing new production bases in ASEAN. These findings provide empirical support for the view that rising geopolitical tensions drive supply chain realignment strategies among Japanese multinational firms.

Table 2. Geopolitical risk and diversification

	(1)	(2)	(3)	(4)
Dep. var.	Import diversification		Production diversification	
ΔGPR × (lagged imports from China/total inputs)	0.961***			
	(0.205)			
ΔGPR × (lagged imports from China/total imports)		1.389***		
		(0.246)		
ΔGPR × (lagged sales in China/global sales)			1.552***	
			(0.214)	
ΔGPR × (lagged sales in China/foreign sales)				2.263***
				(0.236)
Parent-firm FE	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes
Prefecture-year FE	Yes	Yes	Yes	Yes
N	32391	32391	32391	32391
adj. R-sq	0.018	0.018	0.028	0.028

Note: The table reports the effects of geopolitical risk (GPR) on the probability of firm-level supply chain diversification. All GPR exposure variables are standardized. The sample period spans fiscal years 2009 to 2022. A full set of parent-firm, industry-year, and prefecture-year fixed effects are included in all estimations. Standard errors are clustered at the parent firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

5.2 Geopolitical Risk and Entry/Exit/Relocation

The estimation results presented in Table 3 examine how exposure to China-related geopolitical risk affects the probability of Japanese multinational firms either exiting from China or entering ASEAN markets. The results in Panel A indicate that increased exposure to China-related geopolitical risk does not significantly predict a firm's probability of divesting from China, with most coefficients being statistically insignificant. An exception is found in column (3), where exposure measured via the share of affiliate sales in China relative to global sales shows a statistically significant and negative effect. This result suggests that firms with higher exposure to China through sales are less likely to exit in response to heightened geopolitical tensions. One possible interpretation is that firms with deep market penetration in China may face higher sunk costs or perceive continued commercial opportunity, making them more resilient or slower to disengage despite geopolitical headwinds. In contrast, the results in Panel B provide more consistent evidence that GPR exposure to China increases the probability of Japanese multinationals expanding into ASEAN. Specifically, column (1) shows that a one-standard-deviation increase in GPR exposure through imported inputs from China (as a share of total inputs) raises the probability of entering ASEAN by 0.178 percent. Column (4) finds a statistically

significant and stronger effect when exposure is measured via the share of sales in China relative to foreign sales: a one-standard-deviation increase in this measure raises the ASEAN entry probability by 0.466 percent.

These findings indicate that exposure to geopolitical tensions with China leads Japanese multinationals to adopt a "China Plus One" strategy, whereby firms respond not by exiting China outright, but by diversifying their operations through new investments in ASEAN countries. This response may reflect a more flexible and less disruptive adjustment mechanism in the face of rising policy and geopolitical uncertainty.

Table 3. Geopolitical risk and entry/exit

Panel A: Exit from China	(1)	(2)	(3)	(4)
ΔGPR × (lagged imports from China/total inputs)	-0.358			
	(0.222)			
ΔGPR × (lagged imports from China/total imports)		-0.213		
		(0.295)		
ΔGPR × (lagged sales in China/global sales)			-0.569**	
			(0.226)	
ΔGPR × (lagged sales in China/foreign sales)				-0.407
				(0.402)
N	32391	32391	32391	32391
adj. R-sq	0.320	0.320	0.320	0.320

Panel B: Entry into ASEAN	(1)	(2)	(3)	(4)
ΔGPR × (lagged imports from China/total inputs)	0.178*			
	(0.0969)			
ΔGPR × (lagged imports from China/total imports)		0.205		
		(0.149)		
ΔGPR × (lagged sales in China/global sales)			0.110	
			(0.0936)	
ΔGPR × (lagged sales in China/foreign sales)				0.466**
				(0.197)
N	32391	32391	32391	32391
adj. R-sq	0.204	0.204	0.204	0.204

Note: The table presents the effects of geopolitical risk (GPR) on multinational firms' entry and exit decisions. All GPR exposure variables are standardized. The sample period spans fiscal years 2009 to 2022. A full set of parent-firm, industry-year, and prefecture-year fixed effects are included in all estimations. Standard errors are clustered at the parent firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table 4 reports the results on how geopolitical risk affects the relocation behavior of Japanese multinational firms, focusing on two dimensions: production relocation (Panel A) and investment reallocation (Panel B). Across all specifications (columns 1–4) in Panel A, the estimated coefficients of changes in GPR and prior exposure to China—measured in terms of imports or sales—are small and statistically insignificant. This suggests that increases in geopolitical risks do not systematically lead to immediate or direct production relocation from China to other countries within the same firms. Similarly, the estimates for investment adjustments in response to geopolitical shocks are also insignificant across all four specifications. These results imply that Japanese firms do not significantly reallocate investment away from China, even when geopolitical tensions rise, at least during the sample period.

Table 4. Geopolitical risk and relocation

Panel A: Production relocation	(1)	(2)	(3)	(4)
ΔGPR × (lagged imports from China/total inputs)	-0.0801			
	(0.0616)			
ΔGPR × (lagged imports from China/total imports)		-0.0929		
		(0.102)		
ΔGPR × (lagged sales in China/global sales)			0.00313	
			(0.0467)	
ΔGPR × (lagged sales in China/foreign sales)				0.110
				(0.124)
N	32391	32391	32391	32391
adj. R-sq	0.182	0.182	0.182	0.182

Panel B: Investment reallocation	(1)	(2)	(3)	(4)
ΔGPR × (lagged imports from China/total inputs)	-0.199			
	(0.126)			
ΔGPR × (lagged imports from China/total imports)		-0.304		
		(0.195)		
ΔGPR × (lagged sales in China/global sales)			-0.210	
			(0.130)	
ΔGPR × (lagged sales in China/foreign sales)				-0.447
				(0.298)
N	32391	32391	32391	32391
adj. R-sq	0.186	0.186	0.186	0.186

Note: The table presents the effects of geopolitical risk (GPR) on supply chain relocation from China to ASEAN countries. All GPR exposure variables are standardized. The sample period spans fiscal years 2009 to 2022. A full set of parent-firm, industry-year, and prefecture-year fixed effects are included in all estimations. Standard errors are clustered at the parent firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Taken together, Tables 3 and 4 provide no robust evidence that geopolitical risk exposure triggers large-scale production relocation or capital investment reallocation by Japanese multinational firms. Instead, it suggests that firms may rely more on diversification strategies (as shown in Table 2)—such as import or production diversification—rather than fully relocating their operations in response to rising geopolitical uncertainty. This supports the view that adjustments are more incremental and risk-hedging rather than drastic or binary.

5.3 Geopolitical Risk and Reshoring

The estimation results in Table 5 examine how geopolitical risk affects Japanese multinationals' reshoring activities—specifically, the return of production and investment from China to Japan. In Panel A, the four columns evaluate whether geopolitical shocks, interacted with prior China dependence in imports and sales, are associated with a higher probability of production reshoring. None of the estimated coefficients across the four measures of China GPR exposure are statistically significant. This implies that geopolitical tensions involving China, as measured by GPR Index, do not systematically drive decisions by Japanese firms to shift production capacity back to Japan.

Panel B explores whether GPR exposure is associated with Japanese firms adjusting their investment activities from China to Japan. In contrast to production reshoring, the investment response is significant and positive when China exposure is measured by sales. In column (3), the coefficient is 1.165 and statistically significant at the 5% level, while in column (4), the interaction with sales in China/foreign sales yields an even larger coefficient of 1.056, also significant at the 5% level. These results suggest that firms with greater reliance on the Chinese market for sales are more likely to adjust investment back to Japan in response to rising geopolitical risk.

Table 5. Geopolitical risk and reshoring

Panel A: Production reshoring	(1)	(2)	(3)	(4)
ΔGPR × (lagged imports from China/total inputs)	-0.0435			
	(0.105)			
ΔGPR × (lagged imports from China/total imports)		0.0473		
		(0.128)		
ΔGPR × (lagged sales in China/global sales)			-0.0262	
			(0.0989)	
ΔGPR × (lagged sales in China/foreign sales)				0.0773
				(0.188)
N	32391	32391	32391	32391
adj. R-sq	0.246	0.246	0.246	0.246

Panel B: Investment reallocation	(1)	(2)	(3)	(4)
ΔGPR × (lagged imports from China/total inputs)	0.530			
	(0.373)			
ΔGPR × (lagged imports from China/total imports)		-0.179		
		(0.498)		
ΔGPR × (lagged sales in China/global sales)			1.165***	
			(0.417)	
ΔGPR × (lagged sales in China/foreign sales)				1.056*
				(0.551)
N	32391	32391	32391	32391
adj. R-sq	0.189	0.189	0.189	0.189

Note: The table presents the effects of geopolitical risk (GPR) on supply chain reshoring from China to Japan. All GPR exposure variables are standardized. The sample period spans fiscal years 2009 to 2022. A full set of parent-firm, industry-year, and prefecture-year fixed effects are included in all estimations. Standard errors are clustered at the parent firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

6. Robustness Checks and Discussion

Our main results in Section 5 suggest that multinational firms favor a strategy of supply chain diversification—rather than relocation ("friend-shoring") and reshoring or abrupt decoupling—as a means of mitigating geopolitical risk. In this section, we conduct a battery of robustness checks and provide further discussion on geopolitical risk and diversification.

6.1 Alternative Measure of Diversification: Herfindahl Index

In our baseline regressions, the outcome variables—import diversification and production diversification—are defined as binary indicators. Table 6 presents robustness checks using an alternative measure of supply chain diversification based on the Herfindahl-Hirschman Index

(HHI) at the firm level. Specifically, we compute the import HHI based on the regional composition of imported inputs—namely, China, non-China Asia, North America, Europe, the Middle East, Africa, and the rest of the world. Similarly, we calculate the production HHI using the number of overseas manufacturing affiliates by region, including China, non-China Asia, North America, Europe, and the rest of the world. A lower HHI indicates greater diversification, while a higher HHI implies geographical concentration.

Table 6. Import and production Concentration

	(1)	(2)	(3)	(4)
Dep. var.	Import HHI		Production HHI	
ΔGPR×(lagged imports from China/total inputs)	-0.520**			
	(0.248)			
ΔGPR×(lagged imports from China/total imports)		0.318		
		(0.293)		
ΔGPR×(lagged sales in China/global sales)			-0.575**	
			(0.252)	
ΔGPR×(lagged sales in China/foreign sales)				-1.418***
				(0.258)
Parent-firm FE	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes
Prefecture-year FE	Yes	Yes	Yes	Yes
N	32391	32391	32391	32391
adj. R-sq	0.658	0.658	0.683	0.683

Note: The table reports the effects of geopolitical risk (GPR) on the firm-level supply chain concentration, as measured by the Herfindahl-Hirschman Index (HHI). A higher HHI indicates greater concentration (i.e., less diversification) across source countries or production locations. All GPR exposure variables are standardized. The sample period spans fiscal years 2009 to 2022. A full set of parent-firm, industry-year, and prefecture-year fixed effects are included in all estimations. Standard errors are clustered at the parent firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Column (1) shows that a one-standard-deviation increase in exposure to geopolitical risk, through reliance on imports from China (relative to total inputs), is associated with a significant decrease in import HHI by 0.520. This suggests that multinational firms facing higher geopolitical risk tend to diversify their sourcing away from China, thereby reducing import concentration. However, column (2) indicates that when GPR exposure is measured as a share of China in total imports (rather than in total inputs), the effect is positive but not statistically significant. Regarding production HHI, column (3) reveals that GPR exposure via sales in China (as a share of global

sales) is significantly negatively associated with the production HHI. This means firms with greater exposure to the Chinese market tend to geographically diversify their production more under rising geopolitical risk. Column (4) presents an even stronger effect when using the exposure defined as sales in China relative to foreign sales, indicating substantial production diversification in response to geopolitical risks.

These results reinforce our baseline findings by showing that geopolitical risk prompts Japanese multinational firms to diversify both their sourcing and production networks, as evidenced by declining HHIs. The diversification effect is particularly strong on the production side, likely due to the sunk costs involved in FDI. Moreover, the use of HHI as an alternative to binary diversification measures confirms that the effect is not limited to the extensive margin (entry/exit), but also applies to the distributional intensity of global sourcing and production.

6.2 Alternative GPR Index: *People's Daily* GPR (PDGPR) Index

While much of the existing studies relies on the GPR Index based on English-language media (e.g., Caldara and Iacoviello, 2022), growing evidence suggests that GPR indices constructed from local sources can yield distinct and contextually richer insights (e.g., Bondarenko, Lewis, Rottner, and Schüler, 2024; Ito, Lim, and Zhang, 2025).

As a robustness check, we employ an alternative measure of geopolitical risk: the People's Daily GPR (PDGPR) Index, which is constructed based on the frequency of geopolitical terms appearing in the Chinese state-run newspaper *People's Daily* (Ito, Lim, and Zhang, 2025).[17] Appendix Figure A2 presents a comparison between the annual average values of the standard GPR Index and the PDGPR Index for China from 2012 to 2022. While both indices generally follow similar directional trends, the GPR Index (based on global news sources) shows a more pronounced and sustained rise following 2017, peaking around 2021–2022. In contrast, the PDGPR Index (based on Chinese state media) exhibits more volatility and a less pronounced upward trend. The vertical red line marking the start of the US–China trade war in 2018 coincides with a sharp increase in the GPR Index, whereas the PDGPR Index remains relatively subdued during this period. This suggests that global media perceived greater geopolitical tension than was reflected in official Chinese media narratives.

To construct firm-level exposure to geopolitical risk based on China's state media, we construct an alternative variable, $PDGPR\_Exposure_{ft}^{China}$, following the same methodology as the baseline

[17] The dataset from the *People's Daily* consists of more than 0.3 million articles published from 2013 to 2022.

exposure measure. This variable captures the interaction between the year-on-year change in the PDGPR Index and the firm's lagged trade or sales exposure to China. Formally, it is defined as: $PDGPR\_Exposure_{ft}^{China} = \Delta PDGPR_t^{China} \times Exposure_{ft-1}^{China}$, where $\Delta PDGPR_t^{China} = PDGPR_t^{China} - PDGPR_{t-1}^{China}$ is the annual change in the PDGPR Index, and $Exposure_{ft-1}^{China}$ represents the firm's lagged dependence on China via imports or affiliate sales. As with the baseline specification, all coefficients are normalized to reflect the impact of a one-standard-deviation increase in firm-level PDGPR exposure on the probability (in percentage) of a firm undertaking supply chain diversification.

In Table 7, we assess the robustness of our baseline findings by employing the PDGPR index as an alternative measure of geopolitical risk. Columns (1) and (2) examine the effect of PDGPR exposure on the probability of import diversification, while columns (3) and (4) assess its effect on production diversification. Across all specifications, the coefficients on import diversification are statistically insignificant and negative, suggesting no robust evidence that geopolitical risk, as captured by PDGPR, leads to diversification of input sourcing. In contrast, the results in columns (3) and (4) show statistically significant and economically meaningful effects: a one-standard-deviation increase in PDGPR exposure—measured via sales share of affiliates in China—raises the probability of production diversification by approximately 0.49 percent. This finding is consistent across both global and foreign sales exposure measures and mirrors the baseline results using the Caldara and Iacoviello (2022) GPR Index.

Overall, the results lend support to the robustness of the main findings: geopolitical tensions perceived or reported within China itself—captured by state-run media—may prompt Japanese multinationals to diversify their production bases, particularly through expanding into ASEAN countries. However, the weak and statistically insignificant effects on import diversification suggest that sourcing decisions may be less sensitive to media-based risk perceptions in China, potentially due to longer-term intra-firm trade in input procurement.

Table 7. *People's Daily* GPR (PDGPR) Index

	(1)	(2)	(3)	(4)
Dep. var.	Import diversification		Production diversification	
ΔPDGPR × (lagged imports from China/total inputs)	-0.274			
	(0.216)			
ΔPDGPR × (lagged imports from China/total import		-0.116		
		(0.179)		
ΔPDGPR × (lagged sales in China/global sales)			0.490**	
			(0.229)	
ΔPDGPR × (lagged sales in China/foreign sales)				0.490**
				(0.229)
Parent-firm FE	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes
Prefecture-year FE	Yes	Yes	Yes	Yes
N	24844	24844	24844	24844
adj. R-sq	0.017	0.017	0.022	0.022

Note: The table reports the effects of geopolitical risk (GPR) on the probability of firm-level supply chain diversification, using an alternative measure of geopolitical risk—the *People's Daily* GPR (PDGPR) index. All PDGPR exposure variables are standardized. The sample period spans fiscal years 2012 to 2022. A full set of parent-firm, industry-year, and prefecture-year fixed effects are included in all estimations. Standard errors are clustered at the parent firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Furthermore, Table 8 presents a robustness check that jointly estimates the effects of two different geopolitical risk indices: the baseline GPR Index and the alternative PDGPR Index. In columns (1) and (2), the dependent variable is import diversification. The coefficients on the baseline GPR exposure (ΔGPR × lagged imports from China) are positive and statistically significant at the 1% level. In contrast, the alternative PDGPR exposure are statistically insignificant, with small and negative coefficients. This suggests that rising geopolitical tensions, as measured by GPR, are associated with an increase in Japanese firms' import diversification away from China, but similar effects are not detected when risk is measured using Chinese domestic media sources. In columns (3) and (4), the dependent variable is production diversification. Again, the coefficients on GPR exposure are large and statistically significant at the 1% level. The corresponding PDGPR exposure coefficients are positive and statistically significant at the 1% level, though their magnitudes are smaller than those of the baseline GPR exposure. These findings indicate that geopolitical risks drive Japanese firms to diversify their overseas production from China to other locations.

Table 8. GPR vs PDGPR

	(1)	(2)	(3)	(4)
Dep. var.	Import diversification		Production diversification	
ΔGPR×(lagged imports from China/total inputs)	0.931***			
	(0.210)			
ΔPDGPR×(lagged imports from China/total inputs)	-0.162			
	(0.218)			
ΔGPR×(lagged imports from China/total imports)		1.365***		
		(0.250)		
ΔPDGPR×(lagged imports from China/total imports		-0.0635		
		(0.179)		
ΔGPR×(lagged sales in China/global sales)			1.659***	
			(0.221)	
ΔPDGPR×(lagged sales in China/global sales)			0.680***	
			(0.230)	
ΔGPR×(lagged sales in China/foreign sales)				2.226***
				(0.245)
ΔPDGPR×(lagged sales in China/foreign sales)				0.594***
				(0.229)
Parent-firm FE	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes
Prefecture-year FE	Yes	Yes	Yes	Yes
N	24844	24844	24844	24844
adj. R-sq	0.018	0.018	0.025	0.025

Note: The table reports the effects of geopolitical risk (GPR) on the probability of firm-level supply chain diversification, using two alternative measures of geopolitical risk— the standard GPR Index developed by Caldara and Iacoviello (2022) and the *People's Daily* GPR (PDGPR) Index constructed from Chinese state media sources. All GPR and PDGPR exposure variables are standardized. The sample period spans fiscal years 2012 to 2022. A full set of parent-firm, industry-year, and prefecture-year fixed effects are included in all estimations. Standard errors are clustered at the parent firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Taken together, Tables 7 and 8 confirm that the main results are robust to the use of an alternative China-based GPR Index. However, the stronger effects observed under the baseline GPR exposure suggest that international geopolitical sentiment—as captured by global media—may exert a more salient influence on Japanese firms' supply chain decisions than Chinese domestic narratives.

6.3 Economic Policy Uncertainty (EPU)

Recently, there have been significant concerns about policy uncertainty in China and the rest of the world. Empirical studies have examined the impact of economic policy uncertainty (EPU) on both macroeconomic outcomes and firm-level behavior, generally finding that higher levels of EPU negatively affect key economic variables such as capital investment and employment (Baker, Bloom, and Davis, 2016; Huang and Luk, 2020; Ito, Lim, and Zhang, 2023).

A potential concern with our baseline results on supply chain diversification is that they may reflect rising economic policy uncertainty in China, rather than heightened geopolitical risk per se. Since both geopolitical tensions and domestic policy instability may influence firms' international strategies, disentangling their effects is essential. Appendix Figure A3 illustrates the annual average values of China's GPR Index and EPU Index developed by Baker, Bloom, and Davis (2016) from 2009 to 2022. Both indices remain relatively stable and low during the early 2010s, but begin to rise significantly after 2016, peaking around 2018–2020. Notably, both GPR and EPU indices sharply increase in 2018, coinciding with the start of the US–China trade war, suggesting heightened geopolitical tensions and policy uncertainty during this period. While the GPR and EPU indices generally move in tandem, EPU Index exhibits a steeper rise post-2018, particularly around 2020, reflecting heightened uncertainty likely linked to both geopolitical and domestic policy developments.

To address this issue, we explicitly compare the dynamics of the GPR and EPU indices for China and incorporate the EPU index as an alternative explanatory variable in robustness tests. This approach allows us to assess whether our results are robust to the inclusion of economic uncertainty and to isolate the specific role of geopolitical risk in shaping firms' supply chain adjustments. Similarly to the construction of $GPR\_Exposure_{ft}^{China}$, we define firm-level exposure to China's economic policy uncertainty based on the EPU Index developed by Baker, Bloom, and Davis (2016), denoted as $EPU\_Exposure_{ft}^{China}$. This variable captures the interaction between the year-on-year change in the EPU Index and the firm's lagged trade or sales exposure to China.

The results in Table 9 show that the coefficients on the interaction terms between changes in GPR Index and firms' exposure to China remain positive and statistically significant across all specifications, indicating that the diversification effect of geopolitical risk is robust even when accounting for domestic economic policy uncertainty in China. The coefficients on the EPU exposure terms are also positive and significant in some cases—particularly in columns (3) and (4)—indicating that higher policy uncertainty within China independently promotes diversification. This result suggests that multinational firms not only react to international

geopolitical tensions but also to domestic policy unpredictability in host countries. However, the effect of geopolitical risk remains stronger and more consistent than that of economic policy uncertainty, implying that geopolitical considerations exert a more powerful and systematic influence on firms' strategic decisions than domestic policy uncertainty alone. Overall, these findings highlight that Japanese firms' supply chain diversification reflects a dual response to both global and domestic sources of risk and uncertainty, underscoring the multifaceted nature of risk management in global production networks.

Table 9. Economic policy uncertainty

	(1)	(2)	(3)	(4)
Dep. var.	Import diversification		Production diversification	
ΔGPR×(lagged imports from China/total inputs)	0.945***			
	(0.207)			
ΔEPU×(lagged imports from China/total inputs)	-0.116			
	(0.205)			
ΔGPR×(lagged imports from China/total imports)		1.430***		
		(0.255)		
ΔEPU×(lagged imports from China/total imports)		0.261		
		(0.275)		
ΔGPR×(lagged sales in China/global sales)			1.798***	
			(0.221)	
ΔEPU×(lagged sales in China/global sales)			1.593***	
			(0.205)	
ΔGPR×(lagged sales in China/foreign sales)				2.462***
				(0.240)
ΔEPU×(lagged sales in China/foreign sales)				1.467***
				(0.201)
Parent-firm FE	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes
Prefecture-year FE	Yes	Yes	Yes	Yes
N	32391	32391	32391	32391
adj. R-sq	0.018	0.018	0.031	0.030

Note: The table reports the effects of geopolitical risk (GPR) on the probability of firm-level supply chain diversification, controlling for the Economic Policy Uncertainty (EPU) Index developed by Baker, Bloom, and Davis (2016). All GPR and EPU exposure variables are standardized. The sample period spans fiscal years 2009 to 2022. A full set of parent-firm, industry-year, and prefecture-year fixed effects are included in all estimations. Standard errors are clustered at the parent firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

6.4 Sino-Japanese Political Relations

Another potential concern with our main results on supply chain diversification is that they may be driven not by broader geopolitical tensions per se, but rather by the deterioration of bilateral political relations between Japan and China—such as the 2012 Senkaku/Diaoyu Islands dispute—during the sample period. In particular, the deterioration of the Sino-Japanese political relations could independently influence Japanese multinational firms' behavior, prompting shifts in investment, sourcing, or location strategies regardless of geopolitical developments. Previous studies (e.g., Che, Du, Lu, and Tao, 2015; Du, Ju, Ramirez, and Yao, 2017) show that the shocks in political relations may have short-run and long-run impacts on trade and FDI. [18]

Appendix Figure A4 reveals contrasting trends between China's GPR Index and the Sino-Japanese Political Relations (PR) Index over the period from 2009 to 2022. The PR Index developed by Yan and Qi (2009) and Yan (2010) offers a systematic and continuous measure of bilateral political relations between China and key foreign countries such as Japan and the United States. The index is constructed based on monthly reports of bilateral political events drawn from *People's Daily* and the Ministry of Foreign Affairs of the People's Republic of China.[19]

The PR Index exhibits a sharp decline following the 2012 Senkaku/Diaoyu Islands dispute, indicating a significant deterioration in bilateral relations between China and Japan. While the PR Index remains negative for much of the subsequent period, a partial recovery is visible around 2018 before declining again toward 2022. In contrast, the GPR Index rises steadily after 2016 and spikes notably around the onset of the US–China trade war in 2018, highlighting broader geopolitical tensions beyond just the China–Japan relationship. The divergence in the two indices after 2012 suggests that while political relations with Japan remained strained, China's exposure to geopolitical risks became increasingly salient—underscoring the importance of distinguishing

[18] Che, Du, Lu, and Tao (2015) find that Japanese multinationals are less likely to invest in Chinese regions that suffered greater civilian casualties during the Japanese invasion of China form 1937 to 1945, and these regions also trade less with Japan. Using monthly data from 1990 through 2013 for China and some of its major trading partners including Japan, Du, Ju, Ramirez, and Yao (2017) estimate a model of political relations and conclude that the effects of political shocks on trade are short-lived. Although political shocks influence exports to China, the effects largely vanish within two months.

[19] These political events include a broad range of interactions—such as military conflicts, anti-foreign protests, and diplomatic exchanges—which are coded and weighted by severity, similar in spirit to the Goldstein scale widely used in political science. Each event is assigned a score on a standardized scale ranging from −9 (severe confrontation) to +9 (highest degree of friendship). The aggregated monthly scores result in a continuous measure that captures not only the presence of political tension but also its intensity and direction.

between political tensions and geopolitical risks.

To address this concern, Table 10 evaluates whether the observed effects of GPR exposure on supply chain diversification hold when controlling for firm-level exposure to Sino-Japanese political relations. We define a firm-level measure of exposure to the Sino-Japanese political relations, denoted as $PR\_Exposure_{ft}^{China}$. Specifically, we construct this variable as the product of the year-on-year change in the PR Index, $\Delta PR_t^{China\text{-}Japan}$, and firm-level exposure to China in the previous year, $Exposure_{ft-1}^{China}$. As such, $PR\_Exposure_{ft}^{China}$ captures firm-level sensitivity to political shocks, allowing us to estimate how deteriorating (or improving) political relations influence firms' supply chain strategies.

The results in Table 10 show that geopolitical risk continues to have a statistically significant and positive impact on both import diversification and production diversification by Japanese multinational firms. However, the inclusion of an interaction term between a measure of Sino-Japanese political relations and supply chain exposures reveals a mitigating effect. These coefficients are negative and statistically significant across all columns, suggesting that improved bilateral political relations reduce the firms' incentives to diversify. In other words, as the Sino-Japanese political ties improve, the perceived need to diversify supply sources away from China declines. These findings underscore that while geopolitical risk prompts diversification, the broader political context between home and host countries—particularly bilateral relations—can offset or reinforce these responses. This highlights the importance of distinguishing between general geopolitical tensions and specific bilateral political dynamics when evaluating firms' supply chain strategies.

Table 10. Sino-Japanese political relations

	(1)	(2)	(3)	(4)
Dep. var.	Import diversification		Production diversification	
ΔGPR×(lagged imports from China/total inputs)	0.861***			
	(0.206)			
ΔSino-Japanese political relations×(lagged imports from China/total inputs)	-0.578***			
	(0.218)			
ΔGPR×(lagged imports from China/total imports)		1.225***		
		(0.247)		
ΔSino-Japanese political relations×(lagged imports from China/total imports)		-0.873***		
		(0.278)		
ΔGPR×(lagged sales in China/global sales)			1.342***	
			(0.217)	
ΔSino-Japanese political relations×(lagged sales in China/global sales)			-1.078***	
			(0.204)	
ΔGPR×(lagged sales in China/foreign sales)				2.074***
				(0.233)
ΔSino-Japanese political relations×(lagged sales in China/foreign sales)				-1.187***
				(0.200)
Parent-firm FE	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes
Prefecture-year FE	Yes	Yes	Yes	Yes
N	32391	32391	32391	32391
adj. R-sq	0.018	0.018	0.029	0.030

Note: The table reports the effects of geopolitical risk (GPR) on the probability of firm-level supply chain diversification, controlling for the Sino-Japanese political relations (PR) Index developed by Yan and Qi (2009) and Yan (2010). All GPR and PR exposure variables are standardized. The sample period spans fiscal years 2009 to 2022. A full set of parent-firm, industry-year, and prefecture-year fixed effects are included in all estimations. Standard errors are clustered at the parent firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

6.5 Industry Heterogeneity

To explore the possible industry heterogeneity in supply chain responses to geopolitical risks, we stratify the sample by parent firm type—manufacturing versus non-manufacturing firms. Panel A of the Table 11 reveals that Japanese multinational firms in the manufacturing sector respond more strongly to increases in geopolitical risk with greater supply chain diversification. Specifically, for manufacturing parents, the interaction terms between changes in geopolitical risk (ΔGPR) and lagged dependence on China (both import and sales shares) are all positive and statistically significant at the 1% level. This indicates that heightened geopolitical tensions prompt manufacturing firms to diversify both their sourcing and production locations away from China.

By contrast, the coefficients for non-manufacturing parents (Panel B) are generally smaller in magnitude and less significant. Although global and foreign sales exposure still show positive and significant coefficients, import-related exposures yield insignificant results. This divergence suggests that while both manufacturing and non-manufacturing firms are concerned about geopolitical risks, manufacturing firms—likely due to their heavier reliance on physical supply chains—are more proactive in restructuring their China-related operations in response to rising geopolitical uncertainty.

Table 11. Industry heterogeneity

	(1)	(2)	(3)	(4)
Dep. var.	Import diversification		Production diversification	
Panel A: Parenf firms are manufacturing				
ΔGPR × (lagged imports from China/total inputs)	1.102***			
	(0.232)			
ΔGPR × (lagged imports from China/total imports)		1.657***		
		(0.277)		
ΔGPR × (lagged sales in China/global sales)			1.748***	
			(0.256)	
ΔGPR × (lagged sales in China/foreign sales)				2.266***
				(0.266)
N	25823	25823	25823	25823
adj. R-sq	0.022	0.023	0.028	0.027
Panel B: Parenf firms are non-manufacturing	(1)	(2)	(3)	(4)
ΔGPR × (lagged imports from China/total inputs)	0.686			
	(0.502)			
ΔGPR × (lagged imports from China/total imports)		0.771		
		(0.578)		
ΔGPR × (lagged sales in China/global sales)			0.959**	
			(0.388)	
ΔGPR × (lagged sales in China/foreign sales)				2.189***
				(0.551)
N	6303	6303	6303	6303
adj. R-sq	0.009	0.008	0.034	0.035

Note: The table reports the effects of geopolitical risk (GPR) on the probability of firm-level supply chain diversification, separating the sample into manufacturing and non-manufacturing parent firms. All GPR exposure variables are standardized. The sample period spans fiscal years 2009 to 2022. A full set of parent-firm, industry-year, and prefecture-year fixed effects are included in all estimations. Standard errors are clustered at the parent firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

7. Concluding Remarks

This study investigates how geopolitical risk, particularly risks associated with China, influences the behavior of Japanese multinational firms in East and Southeast Asia. By combining firm-level trade and FDI data with geopolitical risk index, we document that Japanese multinational firms respond to heightened geopolitical tensions through selective diversification rather than wholesale relocation ("friend-shoring") and reshoring. Specifically, firms facing higher China-related geopolitical risk tend to reduce their reliance on Chinese inputs and affiliates by expanding production and procurement networks to ASEAN countries, a strategy often referred to as "China Plus One." At the same time, we find little evidence of full-scale divestment from China, indicating that diversification is used as a risk mitigation strategy rather than as a signal of decoupling. These empirical patterns suggest that geopolitical risk can reshape global production networks through firm-level strategic adjustments, without necessarily triggering abrupt shifts in the geography of supply chains.

Given the increasing salience of geopolitical tensions in shaping international production and trade patterns, governments should consider designing industrial and trade policies that support firms' diversification efforts. This includes expanding economic partnerships, improving infrastructure connectivity, and reducing transaction costs for regional production reallocation. Policies that facilitate trade facilitation and regional supply chain resilience—such as regional FTAs and investment agreements—can mitigate the adverse effects of geopolitical risk on firms' global operations. Moreover, the observed trend toward partial reshoring suggests that domestic industrial policies should also support capacity enhancement at home. Policymakers may consider targeted subsidies, workforce training programs, and incentives for capital investment to ensure that reshoring leads to productivity gains rather than inefficiencies. Finally, to better prepare for future shocks, governments should invest in data collection and early warning systems that help firms assess and adapt to geopolitical risk in a timely and strategic manner.

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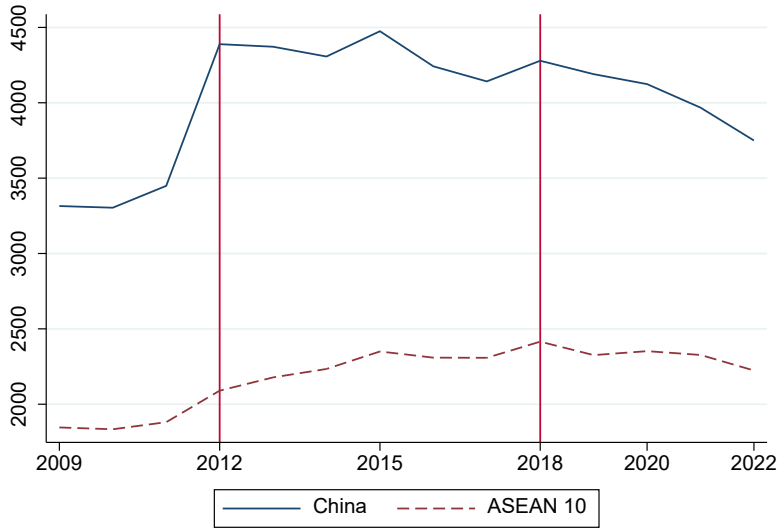
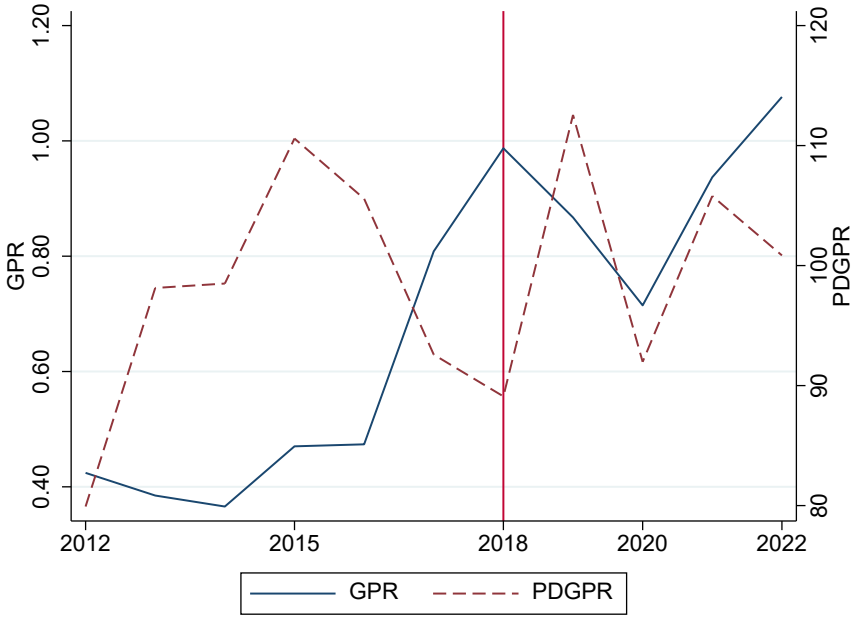
Appendix: Additional Figures and Tables

Figure A1. Number of foreign manufacturing affiliates in ASEAN: Conditional on China presence



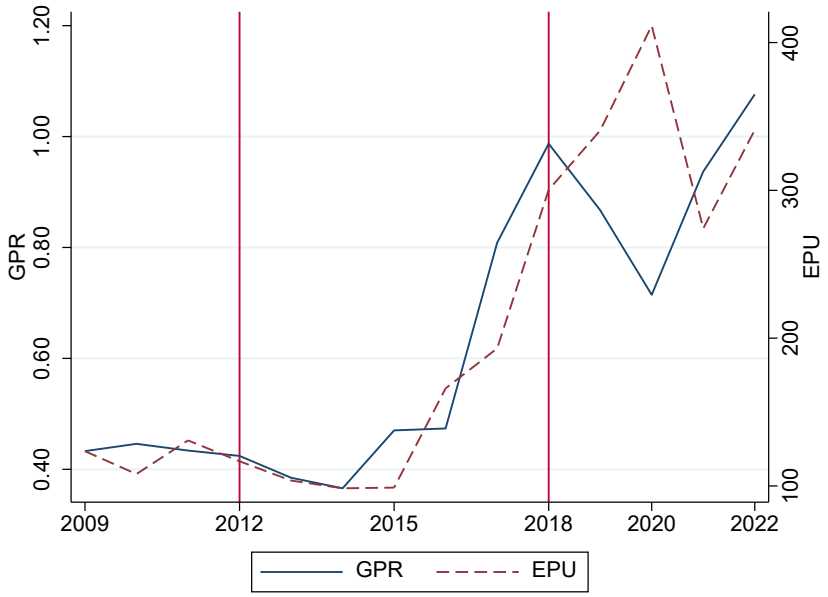
Note: The figure displays the number of Japanese foreign manufacturing affiliates located in ASEAN countries, conditional on parent firms having at least one manufacturing affiliate in China during fiscal years 2009 to 2022. The first vertical red line marks the 2012 China–Japan Senkaku/Diaoyu Islands dispute, and the second vertical red line marks the onset of the US–China trade war in 2018. *Source:* Authors' compilation based on the BSOBA, METI, Japan.

Figure A2. China's GPR and PDGPR indices: 2012-2022



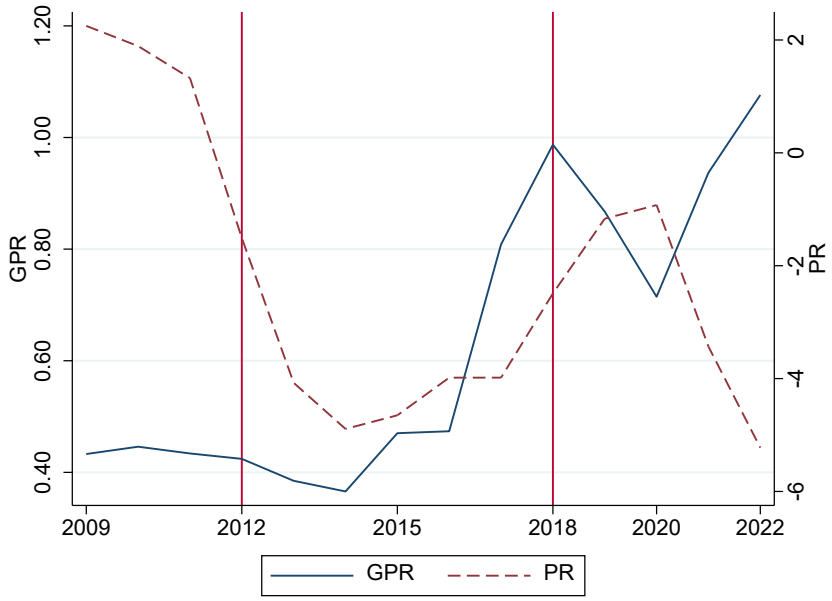
Note: The figure displays the annual average values of the GPR Index and the *People's Daily* GPR (PDGPR) Index for China from 2012 to 2022. Both indices are constructed from monthly data and averaged over each fiscal year. Higher values indicate greater levels of geopolitical risk. The vertical red line marks the onset of the US–China trade war in 2018. *Source:* Authors' compilation based on the GPR Index developed by Caldara and Iacoviello (2022), publicly available at https://www.matteoiacoviello.com/gpr.htm, and the PDGDP Index developed by Ito, Lim, and Zhang (2025).

Figure A3. China's GPR and EPU indices: 2009-2022



Note: The figure displays the annual average values of the GPR Index and the Economic Policy Uncertainty (EPU) Index for China from 2009 to 2022. Both indices are constructed from monthly data and averaged over each fiscal year. Higher values indicate greater levels of geopolitical risk and economic policy uncertainty. Vertical red lines mark two major geopolitical events: the 2012 Senkaku/Diaoyu Islands dispute between China and Japan, and the onset of the US–China trade war in 2018. *Source:* Authors' compilation based on the GPR Index developed by Caldara and Iacoviello (2022), publicly available at https://www.matteoiacoviello.com/gpr.htm, and the EPU Index developed by Baker, Bloom, and Davis (2016), publicly available at https://www.policyuncertainty.com/.

Figure A4. China's GPR and Sino-Japanese PR indices: 2009-2022



Note: The figure displays the annual average values of the GPR Index for China and the Sino-Japanese Political Relations (PR) Index from 2009 to 2022. Both indices are constructed from monthly data and averaged over each fiscal year. Higher values indicate greater levels of geopolitical risk and better political relations. Vertical red lines mark two major geopolitical events: the 2012 Senkaku/Diaoyu Islands dispute between China and Japan, and the onset of the US–China trade war in 2018. *Source:* Authors' compilation based on the GPR Index developed by Caldara and Iacoviello (2022), publicly available at https://www.matteoiacoviello.com/gpr.htm, and the Political Relations Index developed by Yan and Qi (2009) and Yan (2010), publicly available at http://www.tuiir.tsinghua.edu.cn/kycg/zwgxsj.htm.