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The dual effects of geopolitical risk on MNCs' first-tier supply base: a political economy perspective

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Abstract

While prior research has emphasized the economic threats posed by political risk, it is unclear how geopolitical risk (GPR), a supranational-level risk, affects global supply chain decisions. Drawing on the political economy perspective, we posit that GPR presents both opportunities and threats for multinational corporations (MNCs), depending on the political affinity between MNCs' home and host countries. We also identify the risk-mitigation roles of MNCs' political lobbying and market diversification. Using panel data from publicly listed MNCs in the US, we find that host-country GPR increases MNCs' first-tier supply base when home–host country political affinity is high, but decreases when political affinity is low. Moreover, the positive effect of high-affinity host-country GPR on MNCs' supply base is stronger, and the negative effect of low-affinity host-country GPR is weaker for MNCs with high levels of political lobbying or market diversification. These findings enrich the international business research and political economy perspective by elucidating both the opportunities and threats of GPR, and highlight the importance of risk-coping capabilities in managing GPR. These findings also provide insights for MNCs to adapt their strategies amid GPR by leveraging home–host political affinity, engaging in political lobbying, and pursuing market diversification to mitigate geopolitical challenges.

Keywords Geopolitical risk · First-tier supply base · Political economy perspective · Political affinity · Political lobbying · Market diversification

Introduction

Geopolitical risk (GPR) refers to the possibility, occurrence, and intensification of unfavorable incidents related to terrorism, wars, trade disputes, techno-nationalism, and any conflicts among nations and political entities (Caldara & Iacoviello, 2022). As GPR often involves two or more countries, it significantly impacts investment and operational decisions of multinational corporations (MNCs) (Luo & Van Assche, 2023). In particular, GPR leads to serious supply chain disruptions in international business (IB), such as delays in transportation, customs clearance, or facility shutdowns, and thus carries a pivotal influence on MNCs' operations management (Luo & Van Assche, 2023). For example, the Russia–Ukraine conflict has halted oil and gas supplies, limited access to grain, fertilizers, and neon gas, and created challenges for MNCs' global supply chain management.

Extant IB literature suggests that MNCs should reduce involvement in host countries with high GPR in order to decrease operational uncertainty and prevent potential supply chain disruptions (Charpin et al., 2021; Giambona et al.,

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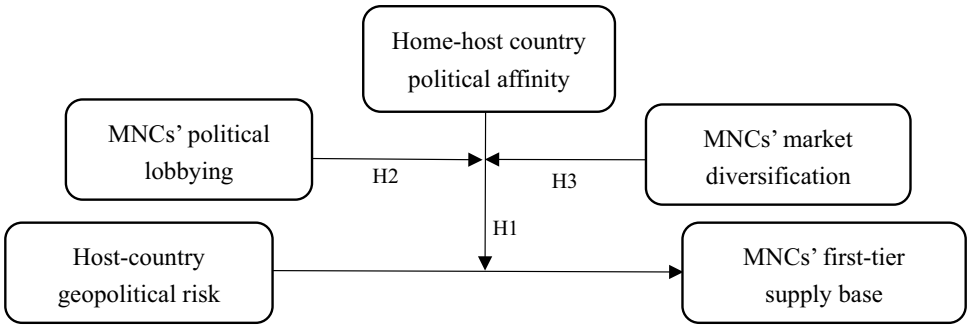
Fig. 1 Conceptual model



2017). However, the prediction contrasts with the reality that MNCs may maintain or even increase their involvement in countries with high GPR. For example, during the recent Israel–Palestine conflict, US MNCs imported $22,232 million worth of goods from Israel in 2024, compared to $20,897 million in 2023[1]. Amidst the Russia–Ukraine conflict, Chinese MNCs increased their investment in Russia by 26.3% in 2023[2]. The discrepancy between theoretical prediction and reality leads to an intriguing question: how does the GPR of a host country affect MNCs' supply chain decisions in that country?

To address this research question, we build upon the political economy perspective (PEP) (Achrol et al., 1983; Li et al., 2022) to examine how host-country GPR influences MNCs' supplier governance in that country. *Host-country GPR* refers to the aggregate level of geopolitical risk faced by a specific country, stemming from geopolitical events that are directly or indirectly linked to that country (Caldara & Iacoviello, 2022). Whereas previous studies highlight the economic threats posed by political risk, we argue that the supranational nature of GPR presents both opportunities and threats for MNCs. We propose that *political affinity*, defined as the alignment of national interests in global affairs between MNCs' home and host countries (Fieberg et al., 2021), is pivotal to assessing the impact of GPR. While host-country GPR introduces uncertainties, political affinity may provide resources for MNCs to seize opportunities out of the uncertainties. In particular, we predict that when political affinity is high, GPR reflects opportunities and thereby increases MNCs' first-tier supply base in the host country, whereas GPR represents threats and thus decreases MNCs' first-tier supply base when political affinity is low. We focus on MNCs' *first-tier supply base*, defined as the extent to which an MNC's first-tier suppliers are located in the host country relative to its global first-tier supplier presence (Dong et al., 2022), because political risk is critical in influencing MNCs' selection and governance of foreign suppliers (Dong et al., 2022).

Moreover, the PEP suggests that the political system is not exogenous to the economy, as business and economic activities can reshape and affect the impact of political forces (Li et al., 2022; Luo et al., 2010). In particular, because political economy systems provide resources and opportunities for MNCs, their impacts are contingent on MNCs' political capability to influence the systems and market capability to capitalize on the opportunities from the systems (Li et al., 2022; Luo & Van Assche, 2023). In terms of political capability, *political lobbying*, defined as the active efforts of an organization to influence government decisions and policies (Choi et al., 2015; Ridge et al., 2017), is a critical ability that enables MNCs to affect home-country policies and secure home government support. Regarding market capability, *market diversification*, defined as the ability to distribute sales across diverse geographic markets, offers cross-market experience and knowledge that are crucial for MNCs to seize opportunities in risky environments (Fang et al., 2007; Hitt et al., 1997). Therefore, we consider political lobbying and market diversification as two critical moderators in our conceptual model, as depicted in Fig. 1.

We test our model using a dataset of 4553 US publicly listed firms with suppliers from 43 countries. With strong empirical support, our study makes three major contributions. First, our study contributes to the PEP and IB research by investigating the impact of supranational GPR, responding to the calls for extending the analysis of political risk to the multilateral level (Li et al., 2022; Luo & Van Assche, 2023). Second, although the PEP indicates both the opportunities and constraints existing in the political economy system, prior IB literature primarily focuses on the threats posed by political risk. This study identifies the role of political affinity in determining the dual effects of GPR on MNCs' first-tier supply base, enriching the PEP by demonstrating both the opportunities and threats stemming from GPR (Lubinski & Wadhwani, 2020). Third, this study contributes to the PEP by uncovering political lobbying and market diversification as mitigating capabilities for GPR, extending prior literature that primarily conceptualizes

[1] US Bureau of Economic Analysis: https://www.bea.gov/data/intl-trade-investment/international-trade-goods-and-services.

[2] Voice of America: https://www.voanews.com/a/china-russia-trade-soared-in-2023-as-commerce-with-us-sank-/7437001.html.

potential strategies for GPR hedging (Luo & Van Assche, 2023) and responding to the call for identifying solutions for MNCs to navigate geopolitical forces (Li et al., 2022; Sun et al., 2021).

Conceptual development

Political risk: a political economy perspective

The PEP emphasizes the interplay between political and economic systems in influencing firm behaviors and performance (Arndt, 1983; Stern & Reve, 1980). The political system consists of different agents that can use their power to alter the goals and legitimacy of the focal entity (Dwyer & Oh, 1987), and the economic system deals with the distribution of resources among various actors (Oatley, 2022; Stern & Reve, 1980). PEP scholars propose that the external political economy system serves as a source of uncertainty and a repository of resources, presenting both constraints and opportunities to the focal entity (Dwyer & Welsh, 1985). These threats and opportunities jointly shape the focal entity's response towards political forces (Luo & Van Assche, 2023).

The importance of political forces becomes pronounced amid the ongoing paradigm shift from economic liberalism—which advocates for free markets and cooperation—to realism, which prioritizes national interests and security in policymaking (Luo & Van Assche, 2023; Witt, 2019). The paradigm shift to realism leads to a global political environment characterized by geopolitical conflicts, making political forces increasingly influential in the global economic system and business decisions. Therefore, IB scholars have highlighted political risk as a pivotal force in influencing MNCs' cross-border decisions at both the state and interstate levels (Oatley, 2022).

State-level political risk refers to uncertainty arising from the focal government's interference, changes in governmental regulations, and shifts in policies that can impact business operations (Bekaert et al., 2014; Wang et al., 2016). Prior studies show that host-country political risk (e.g., corruption and political turnover) can lead to increased foreign subsidiary exit (Sartor & Beamish, 2020), decreased MNCs' supply chain involvement (Dong et al., 2022), and poor performance of foreign subsidiaries in the host country (Zhong et al., 2019). *Interstate-level political risk* refers to uncertainty stemming from tensions between MNCs' home and host countries (Witte et al., 2020; Zhou et al., 2024). Extant research, primarily taking a bilateral approach, emphasizes the relative power and competition between two states and focuses on the negative effects of interstate-level political risk (Oatley, 2022). For example, political conflict between MNCs' home and host countries hinders sovereign wealth funds' acquisition in the host country (Wang et al., 2021) and increases initial acquisition premiums for cross-border acquisitions (Bertrand et al., 2016). Taken together, this line of research focuses mostly on the economic threats caused by political risk, overlooking the potential opportunities arising from the risk. However, in reality, MNCs often respond to political risk differently, and sometimes they may increase their involvement in risky host countries to explore potential opportunities. Indeed, recent IB studies call for research on how MNCs could capitalize on *opportunities* while concurrently reducing *threats* from risk (Lubinski & Wadhwani, 2020).

As a multilateral political risk, GPR stems from competition and disputes between two or more countries; it can arise from violent acts, such as military conflicts or wars, as well as non-violent acts, such as trade wars between China and the US (Caldara & Iacoviello, 2022). With a multilateral nature, GPR has global and far-reaching effects (Li et al., 2022; Luo & Van Assche, 2023). For example, the Russia–Ukraine conflict not only affects the operations of Russian and Ukrainian MNCs but also has a widespread impact on MNCs from third-party countries, including China, the US, and other nations. Recent studies have begun to explore the *negative* impacts of a focal country's GPR on its international trade (Kim & Jin, 2023), FDI (Bussy & Zheng, 2023), divestment rates (Evenett & Pisani, 2023), travel/leisure stock returns (Demiralay & Kilincarslan, 2019), and MNCs' supply chain decisions in response to GPR (Roscoe et al., 2022). However, they overlook the multilateral nature of GPR, which motivates us to investigate its impact through a multilateral analysis.

GPR: a multilateral analysis

Unlike traditional political risk, which is unilateral or bilateral in nature, GPR is a supranational risk that often affects multiple nations beyond the conflicting countries, including the home-country government of third-party MNCs. Accordingly, the influence of host-country GPR on MNCs' decisions is further shaped by the relationship between MNCs' home and host countries (Li et al., 2018; Wang et al., 2021). Therefore, it is critical to examine the confluence of host-country GPR and the home–host country relationship, as indicated by political affinity.

Extant research tends to view host-country GPR as a source of threats for MNCs because it increases transaction risks for MNCs seeking to collaborate with host-country supply chain partners (Meyer et al., 2023). Host-country GPR introduces various obstacles that can impede the flow of information and goods, resulting in increased costs and supply chain disruptions due to tariffs or non-tariff barriers (Roscoe et al., 2020). High-GPR countries are susceptible to elevated tariffs from geopolitically opposing nations, which

increases the costs of importing and exporting products. Also, GPR is associated with non-tariff barriers, such as heightened regulatory scrutiny, customs delays, and government intervention, which hinder the flow of supplied goods and cause supply chain disruptions within the affected country (Meyer et al., 2023). Accordingly, this research stream suggests that MNCs should reduce their involvement in host countries with high GPR.

Taking a multilateral analysis, we argue that whether GPR represents threats or opportunities depends critically on political affinity, a structural condition that serves as a repository of resources for MNCs to manage uncertainty arising from host-country GPR. A politically aligned relationship enhances MNCs' access to crucial market information, enabling them to identify business opportunities in the host market (Li et al., 2018). Also, political affinity boosts the legitimacy of MNCs, fosters goodwill among customers, and encourages partnership from local firms in the host market (Fieberg et al., 2021; Hasija et al., 2020). Accordingly, we suggest that high political affinity signifies aligned interests between the MNCs' home and host countries, allowing MNCs to access resources from both countries and potentially turn GPR into opportunities. In contrast, low political affinity may result in resource losses, increase economic inefficiencies for MNCs in the host country, and turn GPR into threats. Therefore, we suggest that the main effect of GPR on MNCs' first-tier supply base in a host country is vague, making it critical to examine its interplay with political affinity.

Interactive effect of GPR and political affinity

We posit that GPR increases MNCs' first-tier supply base in the host country when political affinity is high. First, strong political affinity creates a condition that allows MNCs to access resources from the host-country government, thereby reducing transaction risk and increasing transaction opportunities induced by host-country GPR. When political affinity is high, MNCs can benefit from favorable host-country policies and support, which helps them bypass potential hazards associated with GPR (Li et al., 2018; Witte et al., 2020). Moreover, as many firms leave the host country with high GPR, MNCs from countries with high political affinity have access to more transaction opportunities. They are likely to obtain preferential treatment from the local government (Li et al., 2018), which encourages them to increase their supply base in the host country with GPR.

Second, when political affinity is high, MNCs can obtain relational resources from local partners, which presents potential relational opportunities for MNCs with local partners in the context of GPR. When the host country encounters geopolitical tensions with another country, MNCs from countries that share a political affinity are perceived as strategically reliable and trustworthy (Fieberg et al., 2021; Hasija et al., 2020). Accordingly, local partners prefer to collaborate with MNCs from countries with high political affinity over others. With the trust from local partners, MNCs can develop joint plans to cope with GPR and facilitate transactions in the host country, leading to a higher supply base in host countries with GPR.

Third, MNCs operating in host countries with high political affinity are more likely to gain legitimacy and support from their home country. High political affinity not only reflects shared geopolitical and economic interests but also fosters cooperation between states, leading to mutual gains in stability and growth (Bertrand et al., 2016; Hasija et al., 2020). As a result, MNCs can receive legitimacy and support from their home country government and organizations, including privileged access to financial capital, political risk insurance, and trade credit insurance to cope with host-country GPR (Wang et al., 2021). For example, political risk insurance serves as a protective shield against potential losses stemming from supply chain disruptions in high-GPR host countries (Adarkwah & Benito, 2023). As a result, the legitimacy and support from the home country enhance MNCs' first-tier supply base in the host country with GPR.

In contrast, when political affinity is low, GPR decreases MNCs' first-tier supply base in the host country. First, low political affinity creates a condition where MNCs may lose critical resources from the host government, escalating the transaction risk associated with GPR. MNCs from low political-affinity countries are more likely to encounter government intervention, trade barriers, and embargoes imposed by the host country government (Fieberg et al., 2021; Zhou et al., 2024), leading to a heightened level of uncertainty and threats induced by GPR. For example, during the Russia–Ukraine conflict, US MNCs faced heightened operational threats in Russia, as the Russian government likely imposed sanctions or expropriation on them, making them reduce their first-tier supply base in Russia.

Second, low political affinity can result in the loss of relational resources for MNCs in the host country, heightening the relational risk arising from GPR. An adversarial country relationship can lead local partners to question the intentions, reliability, and long-term commitment of MNCs, amplifying distrust among local partners towards MNCs from low political affinity nations (Gao et al., 2018). Consequently, local partners may behave opportunistically when facing increased transaction costs or disruptions from GPR. To circumvent the relational risk posed by GPR, MNCs may opt to decrease their supply base in the host country.

Third, MNCs operating in high GPR host countries with low political affinity may lose legitimacy in their home country. Operating in such countries signals MNCs' stance on geopolitical events that are potentially in conflict with the interests of their home country, leading to a loss of

legitimacy and even punishment in their home country. To avoid losing home country legitimacy, MNCs are likely to reduce their supply base in the host country with GPR. For example, in light of the Russia–Ukraine conflict, over two-thirds of US MNCs have reduced their operations in Russia due to pressures from the US government and domestic stakeholders (Balyuk & Fedyk, 2023). Taken together, we predict that

Hypothesis 1: GPR and political affinity have a joint positive impact on MNCs' first-tier supply base in a host country, such that GPR is (a) positively related to MNCs' first-tier supply base when political affinity is high, but (b) negatively related to MNCs' first-tier supply base when political affinity is low.

Contingent roles of political lobbying and market diversification

According to the PEP, the external political economy system presents both uncertainties and resources for MNCs (Dwyer & Welsh, 1985; Stern & Reve, 1980). Also, MNCs are not merely passive recipients of political influences. Instead, they can leverage their capabilities to manage uncertainties and utilize the resources embedded in the political economy system (Li et al., 2022; Stern & Reve, 1980). Accordingly, while political affinity determines whether GPR presents opportunities or threats for MNCs, their joint impact hinges on MNCs' capabilities to deploy and leverage resources.

We focus on both political and market capabilities that enable MNCs to influence political systems and seize opportunities. As a crucial political capability, *political lobbying* allows MNCs to influence home-country government decisions in ways that either benefit their operations or mitigate adverse effects (Abdurakhmonov et al., 2022; Cao et al., 2018). By engaging in political lobbying, MNCs can secure favorable domestic policies, subsidies, or regulatory adjustments that facilitate their international operations (Ridge et al., 2017). As a pivotal market capability in IB, *market diversification* enables MNCs to accumulate knowledge and experience from engaging in sales across overseas markets, which is crucial for identifying and capturing opportunities in diverse markets (Fang et al., 2007; Lu et al., 2014). Leveraging this market experience, MNCs can recognize emerging trends and understand the dynamic political landscape, increasing their chances of capturing opportunities in host countries. Accordingly, we examine the contingent roles of political lobbying and market diversification.

Political lobbying

Governments possess institutional resources and power to make policies that significantly impact a firm's survival and development (Sheng et al., 2011). As a result, firms often engage in lobbying activities to persuade home-country governments to adopt or reject specific policy positions (Abdurakhmonov et al., 2022; Jia, 2018).

We suggest that political lobbying amplifies the positive impact of high-affinity host-country GPR. First, while high-affinity host-country GPR provides MNCs with transaction opportunities, home-country political lobbying further enables MNCs to convert these opportunities into firm-specific privileges. Specifically, MNCs can lobby their home governments to enact favorable policies that benefit them (Ridge et al., 2017), such as negotiating side agreements to secure exclusive quotas beyond standard allocations or establishing fast-track customs procedures through intergovernmental arrangements. These special arrangements help MNCs leverage transaction opportunities, further increasing their supply base in the host country.

Second, political lobbying enables MNCs to capitalize on relational opportunities arising from high-affinity host-country GPR. MNCs from high-affinity countries can gain local partners' general trust (Hasija et al., 2020), and lobbying enables them to secure firm- or industry-specific privileges that provide a competitive advantage and strengthen partner trust. For example, by lobbying their home country government to sign bilateral agreements, MNCs can obtain exclusive benefits (e.g., tax incentives), which serve as visible signals of institutional endorsement and further reinforce local partners' trust. Consequently, local firms are more willing to deepen collaboration and supply products to MNCs with such advantages, enabling MNCs to further increase their supply base in response to GPR in a politically aligned host country.

Third, political lobbying enables MNCs to leverage the general legitimacy derived from operating in host countries with GPR and high political affinity. By influencing policy decisions that favor their particular business interests (Abdurakhmonov et al., 2022; Ridge et al., 2017), MNCs effectively convert the baseline legitimacy into concrete home-government support, such as targeted import financing schemes or exclusive import licenses designed for specific firms or industries. These preferential treatments provide MNCs with distinct advantages in navigating GPR, which in turn, further increase their supply base in the host country.

Meanwhile, political lobbying may weaken the negative impact of low-affinity host-country GPR. First, although low-affinity host-country GPR exposes MNCs to transaction threats, such as trade barriers and embargoes, lobbying the home-country government may secure political interventions to prevent or delay these threats (e.g., exemptions from sudden import bans, temporary tariff waivers). Second, political lobbying helps MNCs obtain home-government resources, such as customized political risk insurance provided by the US government through the Development Finance

Corporation for partner contract breaches due to political interference or violence. These resources enable MNCs to mitigate relational risks caused by low-affinity host-country GPR. Third, with lobbying, MNCs can legitimize their operations in low-affinity host countries by obtaining special treatments or exemptions from their home government, enabling them to maintain operations in low politically aligned host countries with GPR. Taken together, when MNCs' political lobbying is high, they can better handle transaction, relational and legitimacy risks arising from GPR in low-affinity host countries.

Hypothesis 2a: When MNCs have higher political lobbying, the positive effect of GPR on MNCs' first-tier supply base in high-affinity host countries is stronger.

Hypothesis 2b: When MNCs have higher political lobbying, the negative effect of GPR on MNCs' first-tier supply base in low-affinity host countries is weaker.

Market diversification

MNCs with high market diversification accumulate rich experience and knowledge from various markets and develop a bundle of international resources and capabilities (Patel et al., 2018). These capabilities allow MNCs to utilize their core competencies to catch potential opportunities in global markets (Tihanyi et al., 2005).

We predict that market diversification strengthens the joint impact of host-country GPR and political affinity on MNCs' first-tier supply base. Specifically, market diversification amplifies the positive impact of high-affinity host-country GPR. First, market diversification enhances MNCs' ability to exploit transaction opportunities arising from GPR in high-affinity host countries. Operating in diverse markets enables MNCs to gain valuable experience and knowledge in understanding the institutional environment (Barkema & Bell, 1996; Fang et al., 2007). MNCs develop a deep understanding of government policies and regulatory frameworks and gain rich experience in negotiating with policymakers (García-Canal & Guillén, 2008; Jiménez et al., 2018). Such expertise allows them to engage effectively with politically aligned host-country governments and leverage favorable policies, which in turn, further enhance the transaction opportunities from high-affinity host-country GPR.

Second, market diversification enables MNCs to capitalize on relational opportunities from high-affinity host-country GPR. As diversified MNCs possess extensive international experience and stronger bargaining power (Hitt et al., 1997), they can leverage their cross-market experience to forge deeper collaborations with local partners and co-develop risk-mitigation strategies, leading to greater potential for relational opportunities.

Third, market diversification helps MNCs leverage their home-country legitimacy more effectively to manage GPR in high political affinity countries. It provides experiential learning for MNCs (Casillas & Moreno-Menéndez, 2014; Patel et al., 2018), allowing them to develop a deeper understanding of their home country's international policies. As a result, MNCs with high market diversification are better positioned to negotiate favorable political risk insurance terms or leverage government-backed support from their home country to manage high-affinity host-country GPR, which further increases their supply base in the host country.

Meanwhile, market diversification may mitigate the negative impact of low-affinity host-country GPR on MNCs' first-tier supply base. First, the experience gained in different political contexts enables MNCs to develop strategies, such as negotiating favorable terms in procurement contracts, to manage supply chain disruptions and other transaction risk induced by low-affinity host-country GPR. Second, by operating in diverse markets, MNCs strengthen their relationship management capabilities, such as the ability to assess suppliers and develop robust contracts to safeguard against partner opportunistic behavior, thereby alleviating the relational risk stemming from low-affinity host-country GPR. Third, MNCs with a broad geographic footprint can strategically leverage their operations in high-affinity countries to offset potential legitimacy loss arising from operating in low-affinity host countries with GPR. As a result, MNCs face less pressure to reduce their first-tier supply base in the host country. Overall, we predict that

Hypothesis 3a: When MNCs have higher market diversification, the positive effect of GPR on MNCs' first-tier supply base in high-affinity host countries is stronger.

Hypothesis 3b: When MNCs have higher market diversification, the negative effect of GPR on MNCs' first-tier supply base in low-affinity host countries is weaker.

Method

Data sources and sample

To test our hypotheses, we focused on US-incorporated MNCs that have at least one foreign supplier relationship between 2003 and 2022. We collected data from multiple sources. First, we collected firm-level supply chain information from the FactSet Revere database, which offers extensive information on MNCs' global first-tier supplier relationships (Dong et al., 2022). Second, we obtained country-level GPR data from the work of Caldara and Iacoviello

(2022). Third, we obtained political affinity data from United Nations (UN) General Assembly voting records, which demonstrate a country's public stance on a large number of issues, including military, security, social, political, and economic concerns (Bertrand et al., 2016; Li et al., 2018). Fourth, we collected firm-level political lobbying information from the LobbyView database, which contains about 1.3 million lobbying disclosure reports (Kim, 2019). Fifth, we collected firm-level foreign sales information from the Compustat Business Segment, financial information from the Compustat Fundamental Segment, and subsidiary information from the Wharton Research Data Services (WRDS) subsidiary dataset. Sixth, we obtained country-level political stability information from the Worldwide Governance Indicators. Seventh, we obtained country-level cultural distance data from the Hofstede website. Eighth, we collected country-level geographic distance information from the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) Distances database (https://www.cepii.fr/). Ninth, we obtained country GDP information from the World Bank.

The FactSet Revere dataset compiles supply chain data from various public sources, such as firms' annual reports, investor presentations, firm websites, press releases, and media coverage. It provides detailed information for each supply chain relationship, including the names of suppliers, their respective countries, security identifiers, and the start and termination dates of these relationships. Based on the original FactSet Revere dataset, we excluded non-US firms and removed observations with missing security identifiers and respective countries, leading to an initial sample of publicly listed US firms with 376,521 firm-supplier-year observations. Next, we excluded firms without any foreign suppliers in the focal year, leading to 338,668 observations. Subsequently, we excluded US supplier cases, resulting in 143,101 firm-supplier-year observations.

As we measured an MNC's first-tier supply base in a host country as the proportion of its first-tier supplier number in that country out of the total number of suppliers (see below), we transferred the dataset into a firm-country-year panel. Utilizing the Committee on Uniform Securities Identification Procedures (CUSIP) number of each firm, we merged the FactSet Revere dataset with Compustat, yielding a sample of 98,715 firm-country-year observations. Then, we dropped observations with missing information, resulting in a final sample of 91,637 firm-country-year observations, representing 4553 US publicly listed firms with suppliers from 43 countries. Within this sample, 13,128 (14.33%) observations have one foreign supplier, 9653 (10.53%) have two, 7264 (7.93%) have three, and 37,001 (40.27%) have more than 10 foreign suppliers. We started our sample period in 2003 because FactSet Revere's coverage commences in that year. We lagged all explanatory variables by 1 year to reduce potential reverse causality. Consequently, the data on our independent, moderating, and control variables cover the period from 2003 to 2021, and data on the dependent variable span from 2004 to 2022. We winsorized all continuous variables at the 1st and 99th percentiles.

Measures

Dependent variable

MNCs' first-tier supply base Following prior research (Dong et al., 2022), we calculated *first-tier supply base* (%) in a host country as the number of first-tier suppliers in that country divided by the MNC's total number of suppliers (including both domestic and foreign) in a given year. This measure is consistent with prior operationalizations of foreign country involvement (e.g., Fernández & Nieto, 2006; Laursen et al., 2012).

Independent variable

Host-country GPR Prior GPR research has predominantly relied on specific adverse events, such as 9/11, the Russian invasion of Ukraine, or US–China trade war, to explore their impact on economic outcomes (e.g., Fan et al., 2024; Nguyen et al., 2023). However, this approach overlooks the evolving nature of geopolitical threats and prevents comparisons across different studies (Caldara & Iacoviello, 2022). Given the complexity and significant regional variations in GPR, prior literature lacks a robust country-level indicator capturing real-time geopolitical tensions, which hinders the empirical analysis of GPR's impact (Caldara & Iacoviello, 2022). For this reason, Caldara and Iacoviello (2022) developed a newspaper-based monthly country-level GPR index, using an algorithm that calculates the proportion of articles covering geopolitical events and threats. These articles are sourced from prominent newspapers in the US, the United Kingdom, and Canada, including the *Chicago Tribune*, the *Daily Telegraph*, the *Financial Times*, the *Globe and Mail*, the *Guardian*, the *Los Angeles Times*, the *New York Times*, *USA Today*, the *Wall Street Journal*, and the *Washington Post*. These newspapers cover geopolitical events of global interest.

The GPR index is based on 25 million news articles (about 30,000 per month) published in these newspapers. It uses a dictionary-based method to calculate the ratio of articles discussing rising GPR to total articles published each month. This index captures both historical geopolitical conflicts and potential geopolitical threats that may evolve into

significant actions in the future, consisting of two subcomponents: geopolitical acts and geopolitical threats.[3]

For each country, Caldara and Iacoviello (2022) construct a country-specific measure of GPR based on the percentage of news articles published each month that contain both GPR-related terms (e.g., "war," "sanction") and references to the host country or its major metropolitan areas, divided by the total number of news articles published in that month. As such, a country's GPR index captures not only its direct geopolitical conflicts with other nations but also the indirect effects of conflicts among other nations, aligning well with the supranational nature of GPR.[4] Accordingly, we calculated the annual mean value of the monthly country GPR index to measure yearly host-country GPR and presented the GPR index for 12 major countries from 2003 to 2021 in Appendix Fig. 3.

Moderators

Political affinity Following prior research (Bertrand et al., 2016; Li et al., 2018), we measured political affinity between the US and host countries using UN voting records in a focal year. Countries that closely align their voting patterns with the US in the UN General Assembly are likely to have lower levels of political tension with the US, whereas countries whose voting patterns diverge from the US may experience higher levels of political tension with the US (Gartzke, 1998). We quantified the degree of political affinity between a focal host country and the US using Eq. (1):

$$\text{Political affinity}_t = 1 - [2 \times d_t / \text{dmax}_t] \quad (1)$$

where d denotes the sum of vote distances for the host country-US pair in the focal year, and *dmax* represents the maximum possible vote distance for the host country-US pair in that year. We calculated vote distance with the following process: (1) We assigned a value of one to "Yes" votes, zero to "No" votes, and 0.5 to abstentions, with absences regarded as missing values. (2) For a given issue, if a focal host country and the US voted in the same way, the distance for that vote was recorded as zero. If they voted in opposite ways, the distance was recorded as one. (3) This distance measure was then accumulated for the host country-US pair in the focal year. The resulting value of Political affinity$_t$ ranges from − 1 (indicating all votes are different) to + 1 (indicating all votes are the same), reflecting strong and weak political tensions, respectively (Gartzke, 1998).

UN voting records cover a wide range of issues, including military, security, economic, social, and political concerns. As such, they provide a comprehensive measure of the similarity in national interests in global affairs. Voting at the General Assembly is non-binding, allowing countries greater freedom to express their genuine views (Gartzke, 1998). Countries that vote similarly tend to share common perspectives and hold cooperative relationships, while countries that vote differently likely experience political tensions or conflict. Consequently, prior business studies have widely used UN voting similarity as a proxy for interstate political affinity (Adarkwah et al., 2024; Fieberg et al., 2021; Li et al., 2018).

Political lobbying We focused on a firm's lobbying activities related to GPR and supply chains by examining the "general issue area code" in lobbying reports (Kim, 2019). A lobbying issue is GPR-related or supply chain-related if its corresponding code is "HOM" (Homeland Security), "FOR" (Foreign Relations), or "TRD" (Trade: domestic & foreign). After identifying related lobbying issues, we calculated political lobbying as the logarithm of one plus the total lobbying expenditures on GPR/supply chain-related issues in the focal year (Kim, 2019).

Market diversification We measured an MNC's market diversification using the Compustat Business Segment dataset, which provides market segment information for US publicly listed firms. Using sales data from different market segments (i.e., foreign countries or regions), we calculated the Market Herfindahl Index (M_{Hrf}) by summing the squares of each segment's annual sales ratio to the firm's total sales (Hendricks et al., 2009; Johnson et al., 2023).

[3] Caldara and Iacoviello (2022) only provide monthly *worldwide* geopolitical acts and geopolitical threats data, but such sub-indexes for each country are not available. For details of the search query, please refer to Caldara and Iacoviello (2022).

[4] Using the UK's GPR as an example. First, GPR arises from geopolitical events directly linked to the UK. For example, a news article titled "Britain and E.U. Reach Landmark Deal on Brexit" (2020) describes progress and challenges in Brexit negotiations, demonstrating direct GPR for the UK (accessed via *The New York Times*. https://www.nytimes.com/2020/12/24/world/europe/brexit-trade-deal-uk-eu.html).

Second, GPR can stem from events indirectly linked to the UK. For example, during the US–China trade war (2018–2020), the US pressured the EU to "take sides", aiming to restrict high-tech exports to and imports from China. A related news article titled "Europe divided on Huawei as US pressure to drop company grows" (2020), reports that Robert O'Brien, the US National Security Adviser, met with counterparts from the UK, France, Germany, and Italy to urge European nations to exclude Huawei from Europe's 5G networks (accessed via *The Guardian*. https://www.theguardian.com/technology/2020/jul/13/europe-divided-on-huawei-as-us-pressure-to-drop-company-grows).

Both articles are used to measure UK's GPR in 2020, as they mention (a) GPR-related terms (e.g., "threat," "risk") and (b) references to the UK. As such, the GPR measure for the UK in 2020 is influenced by both the Brexit and the US–China trade war events.

$$M_{\text{Hrf}} = \sum_{i=1}^{N} \left(\frac{S_i}{S} \right)^2 \quad (2)$$

where S_i denotes an MNC's annual sales in the ith country or region, S represents the total annual sales, and N is the total number of countries or regions reported in Compustat. We used $1 - M_{\text{Hrf}}$ as the measure for market diversification. When an MNC operates in only one country or region, its market diversification is 0. The diversification value increases as the MNC expands to more countries or regions.

Control variables

We controlled for a set of firm- and country-level variables that may impact an MNC's first-tier supply base in the host country. At the firm level, we controlled for *firm size* (natural logarithm of the total number of employees) and *return on assets* (ROA) (Dong et al., 2022). Given that a firm's financial well-being plays a pivotal role in its capacity to engage with foreign suppliers, we included *financial leverage*, measured by total liabilities to total assets. We also included the *market-to-book ratio*, measured by the ratio of market value to book value of total assets. To account for the impact of growth opportunities on international decision-making, we controlled for *sales growth*, which is measured by the growth rate of sales in the focal year (Dong et al., 2022).

We further controlled for *operational flexibility,* as it enables firms to respond swiftly to unforeseen disruptions (Gu et al., 2018). We used the measure developed by Gu et al. (2018), calculated as the historical range (maximum minus minimum) of a firm's operating costs-to-sales ratio, scaled by the volatility of its sales growth, and then reverse-coded it. MNCs' international experience and the degree of supply chain internationalization are expected to influence their capability to manage GPR and supply base across different countries. As such, we controlled for MNCs' *host-country experience*, measured by the number of subsidiaries in a particular host country in a focal year (Gao & Pan, 2010; Lu et al., 2014). We also controlled for *supplier internationalization*, measured by the percentage of foreign suppliers to total suppliers (Lu et al., 2014).

At the country level, state-level risks such as policy uncertainty may affect MNCs' supplier decisions in that country (Huang et al., 2015). Therefore, we controlled for the host country's *political stability* using the Worldwide Governance Indicators based on survey responses from over 20 think tanks, international organizations, nongovernmental organizations, and private firms (Kaufmann et al., 2010). We also included the host country's *economic policy uncertainty* index developed by Baker et al. (2016), as it likely influences MNCs' international operations (Dong et al., 2022). It comprises four weighted uncertainty components: news-based policy uncertainty, CPI forecast interquartile range, tax legislation expiration, and federal expenditure dispersion[5]. We divided the index by 100 to enhance the readability of its coefficient in regression analysis.

We controlled for *cultural distance* between the US and the host country using the corrected standardized Euclidean distance formula, as it creates communication and negotiation challenges between MNCs and local suppliers (Griffith et al., 2021). We also controlled for *geographic distance* between the US and host country, measured by population-weighted distance based on city-level data to account for population distribution in each country (Mayer & Zignago, 2011). Since MNCs often consider the host country's economic conditions when making supply chain decisions, we included *host-country GDP*, measured by the logarithm of gross domestic product (Hahn & Bunyaratavej, 2010). To account for the differences across industries, time, and countries, we controlled for industry, year, and host-country fixed effects.

Estimation approach

Endogenous factors, such as the unobservable time-varying attributes of the host country, may potentially drive both GPR and the first-tier supply base. Furthermore, historical supply chain decisions may have a significant impact on the current global supply chain configuration. However, including the lagged dependent variable directly in the regression model can result in correlations with fixed effects in the error term, introducing dynamic panel bias with biased coefficient estimates (Arellano & Bover, 1995).

In response to these concerns, we conducted a system generalized method of moments (GMM) dynamic panel method, which creates internal instruments using lagged endogenous regressors and hence accounts for the potential correlation between the endogenous variable and the error term (Arellano & Bover, 1995; Dong et al., 2022).

We utilized the 1-year lagged value of MNCs' first-tier supply base in the host country as an instrumental variable. To assess the validity of our GMM approach and the effectiveness of this instrumental variable, we conducted two tests. First, we performed the Arellano-Bond test, revealing that the first-order autocorrelation of the model is statistically significant ($p < 0.01$), while the second-order autocorrelation is not statistically significant ($p > 0.10$). These results suggest that the enduring influence of previous supply chain decisions follows a first-order autoregressive process. Second, we conducted a difference-in-Hansen's J test. The outcome is statistically insignificant, suggesting that the 1-year lagged dependent variable used as an

[5] Economic Policy Uncertainty: https://www.policyuncertainty.com/about.html.

instrumental variable is uncorrelated with the error terms. These results indicate that the system GMM approach effectively addresses the previously mentioned endogeneity concern (Arellano & Bover, 1995).

We used the following formula to estimate the influence of host-country GPR on an MNC's first-tier supply base in the host country.

$$\text{First - tier supply base}_{i,c,t+1} = \alpha_j + \delta_t + \vartheta_c + \beta \text{GPR}_{c,t} + \theta \text{ first - tier supply base}_{i,c,t} + \gamma X_{i,c,t} + \varepsilon_{i,c,t} \quad (3)$$

Where i indicates firm, c indicates host county, t indicates year, j indicates industry. $\text{First - tier supplier base}_{i,c,t+1}$ is the ratio of the supplier distributing in the focal host country. α_j, δ_t, and ϑ_c are industry-fixed, year-fixed, and country-fixed effects, respectively. $\text{GPR}_{c,t}$ is Caldara and Iacoviello (2022)'s GPR index in the focal host country, $X_{i,c,t}$ represents the control variables, and $\varepsilon_{i,c,t}$ represents the residual term. Since categorizing host countries by high or low political affinity to the US would reduce data richness and introduce issues like arbitrary splits in political affinity scores, we use political affinity as a moderator interacting with the GPR to test our hypothesis.

Results

Descriptive statistics

Table 1 presents the descriptive statistics and correlation table. We checked Variance Inflation Factors (VIFs) for all regression models, which range from 1.02 to 2.08, well below the commonly accepted threshold of 10. Thus, multicollinearity is not a major concern.

Hypothesis testing

Table 2 presents the results of the system GMM estimation. In Model 1, we examined the main impact of GPR on MNCs' first-tier supply base. As Model 1 shows, the impact is negative but non-significant ($b = -0.306$, $p = 0.338$). In Model 2, the coefficient of the interaction term (i.e., GPR × political affinity) is positive and significant ($b = 1.655$, $p = 0.001$). Because system GMM estimation in Stata (*xtdpdsys*) cannot estimate the marginal effect of the interaction term, we cannot calculate the effect size of GPR when the moderator is high or low. Alternatively, we used subsample analysis to calculate and plot the effect of GPR in two groups: high political affinity (above median) and low political affinity (below median) samples. As shown in Panel A, Fig. 2, the impact of GPR on MNCs' first-tier supply base is positive and significant in the sample with high political affinity ($b = 0.841$, $p = 0.042$), in support of H1a. The effect size shows that a one standard deviation (SD) increase in GPR from the mean level in a country with high political affinity results in a 1.73% increase in MNCs' first-tier supply base in that country. In the low political affinity sample, the impact of GPR is negative and significant ($b = -2.723$, $p = 0.000$), supporting H1b. Regarding the effect size, a one SD increase in GPR from the mean level in a country with low political affinity results in a 5.59% decrease in MNCs' first-tier supply base in that country. These results support H1a and H1b.

In Model 3, the coefficient of the three-way interaction term (i.e., GPR × political affinity × political lobbying) is positive and significant ($b = 0.238$, $p = 0.001$). Panels B and C of Fig. 2 show that in the sample of high political affinity, the positive impact of GPR on MNCs' first-tier supply base is stronger for MNCs with high political lobbying (above median) ($b = 0.943$, $p = 0.002$) than for those with low political lobbying (below median) ($b = 0.131$, $p = 0.785$), supporting H2a. Regarding the effect size, a one SD increase in GPR in a high-affinity host country leads to a 1.94% increase in the first-tier supply base for MNCs with high political lobbying. Conversely, in the low political affinity sample, the negative impact of GPR is weaker for MNCs with high political lobbying ($b = -0.780$, $p = 0.023$) than for those with low political lobbying ($b = -3.401$, $p = 0.000$), in support of H2b. For the effect size, a one SD increase in GPR in a low-affinity country results in a 1.60% decrease in the first-tier supply base for MNCs with high political lobbying, and a 6.98% decrease for those with low political lobbying.

In Model 4, the coefficient of the three-way interaction term (i.e., GPR × political affinity × market diversification) is positive and significant ($b = 5.132$, $p = 0.001$). Panels D and E of Fig. 2 show that, in the sample of high political affinity, the positive impact of GPR on MNCs' first-tier supply base is stronger for MNCs with high market diversification (above median) ($b = 1.099$, $p = 0.022$) than for those with low market diversification (below median) ($b = 0.379$, $p = 0.547$), in support of H3a. Regarding the effect size, a one SD increase in GPR in a country with high political affinity leads to a 2.26% increase in the first-tier supply base for MNCs with high market diversification. However, in the sample of low political affinity, the negative impact of GPR on MNCs' first-tier supply base is weaker for MNCs with high market diversification ($b = -0.956$, $p = 0.015$) than for those with low market diversification ($b = -2.939$, $p = 0.000$), supporting H3b. For the effect size, a one SD increase in GPR in a country with low political affinity results in a 1.97% decrease in the first-tier supply base for MNCs with high market diversification, and a 6.03% decrease for those with low market diversification.

Table 1 Descriptive statistics and correlations

	Mean	Std	1	2	3	4	5	6	7	8
1 Tier-1 supply base (%)	14.13	21.16	1							
2 GPR	0.30	0.29	0.06	1						
3 Political affinity	0.08	0.37	0.03	0.23	1					
4 Political lobbying	3.04	5.86	− 0.23	− 0.06	− 0.04	1				
5 Market diversification	0.31	0.29	− 0.20	− 0.05	− 0.07	0.25	1			
6 Firm size (log)	2.54	1.58	− 0.39	− 0.08	− 0.05	0.44	0.32	1		
7 ROA	0.03	0.07	− 0.11	− 0.00	− 0.00	0.10	0.09	0.23	1	
8 Financial leverage	0.68	0.26	0.01	0.00	0.00	0.02	− 0.21	0.13	− 0.03	1
9 Market-to-book ratio	3.73	8.63	− 0.01	0.00	− 0.01	0.02	0.03	0.03	0.04	− 0.04
10 Sales growth	0.16	0.31	0.20	0.03	0.01	− 0.18	− 0.29	− 0.22	0.00	0.19
11 Operational flexibility	− 2.11	4.00	− 0.18	− 0.02	− 0.01	0.14	0.28	0.28	0.19	− 0.09
12 Host-country experience	1.41	3.80	− 0.08	0.14	0.03	0.12	0.28	0.22	0.05	− 0.03
13 Supplier internationalization	0.44	0.24	0.54	− 0.04	− 0.07	0.00	0.13	− 0.05	− 0.02	0.07
14 Political stability	0.41	0.72	0.03	− 0.18	0.22	− 0.07	− 0.07	− 0.13	− 0.03	− 0.05
15 Economic policy uncertainty	1.80	0.98	0.01	0.43	0.18	− 0.01	− 0.04	− 0.01	− 0.02	0.07
16 Cultural distance	15.86	7.59	− 0.02	− 0.20	− 0.53	0.02	0.08	0.04	− 0.00	− 0.01
17 Geographic distance	8209	3760	− 0.00	− 0.17	− 0.44	0.01	0.07	0.04	0.00	− 0.01
18 Host-country GDP	28.02	1.01	0.08	0.52	− 0.02	− 0.08	− 0.06	− 0.12	− 0.02	− 0.01

	Mean	Std	9	10	11	12	13	14	15	16	17
1 Tier-1 supply base (%)	14.13	21.16									
2 GPR	0.30	0.29									
3 Political affinity	0.08	0.37									
4 Political lobbying	3.04	5.86									
5 Market diversification	0.31	0.29									
6 Firm size (log)	2.54	1.58									
7 ROA	0.03	0.07									
8 Financial leverage	0.68	0.26									
9 Market-to-book ratio	3.73	8.63	1								
10 Sales growth	0.16	0.31	0.08	1							
11 Operational flexibility	− 2.11	4.00	− 0.01	− 0.27	1						
12 Host-country experience	1.41	3.80	0.00	− 0.13	0.11	1					
13 Supplier internationalization	0.44	0.24	− 0.01	0.08	− 0.04	0.01	1				
14 Political stability	0.41	0.72	− 0.00	0.02	− 0.04	− 0.00	− 0.05	1			
15 Economic policy uncertainty	1.80	0.98	0.02	− 0.00	− 0.00	0.08	0.08	0.01	1		
16 Cultural distance	15.86	7.59	− 0.00	− 0.01	0.01	− 0.12	0.08	− 0.36	− 0.25	1	
17 Geographic distance	8209	3760	0.01	− 0.01	0.01	− 0.08	0.09	− 0.26	− 0.26	0.51	1
18 Host-country GDP	28.02	1.01	0.00	0.04	− 0.04	0.09	0.00	0.03	0.18	− 0.01	− 0.04

$N = 91{,}637$. $p < 0.05$ for correlations (absolute value) greater than 0.011

Testing the effect of top-damaging geopolitical shocks

Certain omitted variables, such as the unobservable time-varying attributes of the host country (e.g., foreign policy), may drive both GPR and MNCs' supplier decisions, potentially confounding our results. To mitigate this concern, we adopted a GMM model to test the impact of *geopolitical shocks*, defined as disruptive events often arising from violent acts that have substantial and far-reaching effects on the political or economic landscape. Caldara and Iacoviello (2022) identify the 16 most significant geopolitical events between 2003 and 2020 based on the GPR index.[6]

[6] 2014/03 Russia invades Crimea and 2014/09 escalation of the Ukraine/Russia conflict are considered as one geopolitical event.

Table 2 Effects of GPR on tier-1 supply base$_{(t+1)}$

DV.	Tier-1 Supply base$_{(t+1)}$									
Model #	(1)		(2)		(3)		(4)		(5)	
GPR	− 0.306		− 0.485		− 0.491		− 0.425		− 0.443	
	(0.319)	[0.338]	(0.319)	[0.129]	(0.320)	[0.125]	(0.319)	[0.183]	(0.320)	[0.167]
GPR × Political affinity **(H1)**			1.655		1.641		1.560		1.562	
			(0.514)	[0.001]	(0.514)	[0.001]	(0.515)	[0.002]	(0.516)	[0.002]
GPR × Political affinity × Political lobbying **(H2)**					0.238				0.200	
					(0.069)	[0.001]			(0.071)	[0.005]
GPR × Political lobbying					− 0.039				− 0.023	
					(0.031)	[0.213]			(0.032)	[0.468]
Political affinity × Political lobbying					0.054				0.049	
					(0.022)	[0.014]			(0.022)	[0.029]
GPR × Political affinity × Market diversification **(H3)**							5.132		4.189	
							(1.539)	[0.001]	(1.575)	[0.008]
GPR × Market diversification							− 2.281		− 2.140	
							(0.753)	[0.002]	(0.765)	[0.005]
Political affinity × Market diversification							0.652		0.431	
							(0.506)	[0.198]	(0.516)	[0.403]
Political affinity	− 0.291		− 0.390		− 0.377		− 0.350		− 0.345	
	(0.377)	[0.440]	(0.378)	[0.302]	(0.378)	[0.319]	(0.379)	[0.355]	(0.379)	[0.363]
Political lobbying	− 0.002		− 0.002		− 0.008		− 0.001		− 0.006	
	(0.012)	[0.872]	(0.012)	[0.880]	(0.012)	[0.518]	(0.012)	[0.919]	(0.012)	[0.608]
Market diversification	− 0.261		− 0.257		− 0.251		− 0.424		− 0.393	
	(0.383)	[0.496]	(0.383)	[0.502]	(0.383)	[0.512]	(0.387)	[0.273]	(0.387)	[0.310]
Firm size	0.131		0.128		0.129		0.130		0.132	
	(0.126)	[0.299]	(0.126)	[0.310]	(0.126)	[0.306]	(0.126)	[0.300]	(0.126)	[0.296]
ROA	− 1.274		− 1.270		− 1.274		− 1.266		− 1.268	
	(0.550)	[0.021]	(0.550)	[0.021]	(0.550)	[0.021]	(0.550)	[0.021]	(0.550)	[0.021]
Financial leverage	0.604		0.607		0.612		0.619		0.620	
	(0.272)	[0.026]	(0.271)	[0.025]	(0.272)	[0.024]	(0.271)	[0.023]	(0.272)	[0.022]
Market-to-book ratio	− 0.003		− 0.003		− 0.003		− 0.003		− 0.003	
	(0.003)	[0.286]	(0.003)	[0.287]	(0.003)	[0.300]	(0.003)	[0.297]	(0.003)	[0.307]
Sales growth	− 0.170		− 0.172		− 0.170		− 0.166		− 0.165	
	(0.116)	[0.144]	(0.116)	[0.140]	(0.116)	[0.145]	(0.116)	[0.154]	(0.116)	[0.157]
Operational flexibility	0.012		0.012		0.012		0.012		0.012	
	(0.017)	[0.502]	(0.017)	[0.501]	(0.017)	[0.492]	(0.017)	[0.503]	(0.017)	[0.495]

Table 2 (continued)

DV.	Tier-1 Supply base$_{(t+1)}$									
Model #	(1)		(2)		(3)		(4)		(5)	
Host-country experience	0.007		0.009		0.010		0.012		0.012	
	(0.014)	[0.586]	(0.014)	[0.499]	(0.014)	[0.468]	(0.014)	[0.400]	(0.014)	[0.396]
Supplier internationalization	44.944		44.953		44.968		44.951		44.963	
	(0.319)	[0.000]	(0.319)	[0.000]	(0.319)	[0.000]	(0.319)	[0.000]	(0.319)	[0.000]
Political stability	0.451		0.539		0.553		0.552		0.562	
	(0.210)	[0.032]	(0.212)	[0.011]	(0.212)	[0.009]	(0.212)	[0.009]	(0.212)	[0.008]
Economic policy uncertainty	− 0.095		− 0.124		− 0.120		− 0.119		− 0.116	
	(0.059)	[0.110]	(0.059)	[0.035]	(0.059)	[0.042]	(0.059)	[0.044]	(0.059)	[0.050]
Cultural distance	0.182		0.170		0.190		0.186		0.200	
	(0.402)	[0.651]	(0.402)	[0.673]	(0.402)	[0.636]	(0.402)	[0.644]	(0.402)	[0.618]
Geographic distance	− 0.024		− 0.024		− 0.024		− 0.024		− 0.024	
	(0.002)	[0.000]	(0.002)	[0.000]	(0.002)	[0.000]	(0.002)	[0.000]	(0.002)	[0.000]
Host-country GDP	1.107		1.188		1.218		1.217		1.239	
	(0.451)	[0.014]	(0.452)	[0.009]	(0.452)	[0.007]	(0.452)	[0.007]	(0.452)	[0.006]
Lagged tier-1 supply base	0.320		0.319		0.320		0.320		0.320	
	(0.009)	[0.000]	(0.009)	[0.000]	(0.009)	[0.000]	(0.009)	[0.000]	(0.009)	[0.000]
Constant	138.762		137.007		135.183		135.803		134.395	
	(22.302)	[0.000]	(22.311)	[0.000]	(22.325)	[0.000]	(22.314)	[0.000]	(22.327)	[0.000]
Year, industry, country FE	Yes		Yes		Yes		Yes		Yes	
Observations	69221		69221		69221		69221		69221	
Wald chi-square	4.5e+04		4.5e+04		4.5e+04		4.5e+04		4.5e+04	
AR(1) *p* value	< 0.01		< 0.01		< 0.01		< 0.01		< 0.01	
AR(2) *p* value	0.159		0.156		0.155		0.156		0.157	
Hansen test *p* value	0.650		0.652		0.655		0.653		0.653	

Standard errors are reported in parentheses; *p* values are reported in square brackets (two-tailed). The original sample size is 91,637, but dynamic panel regression reduces the number of observations by including lagged dependent variable

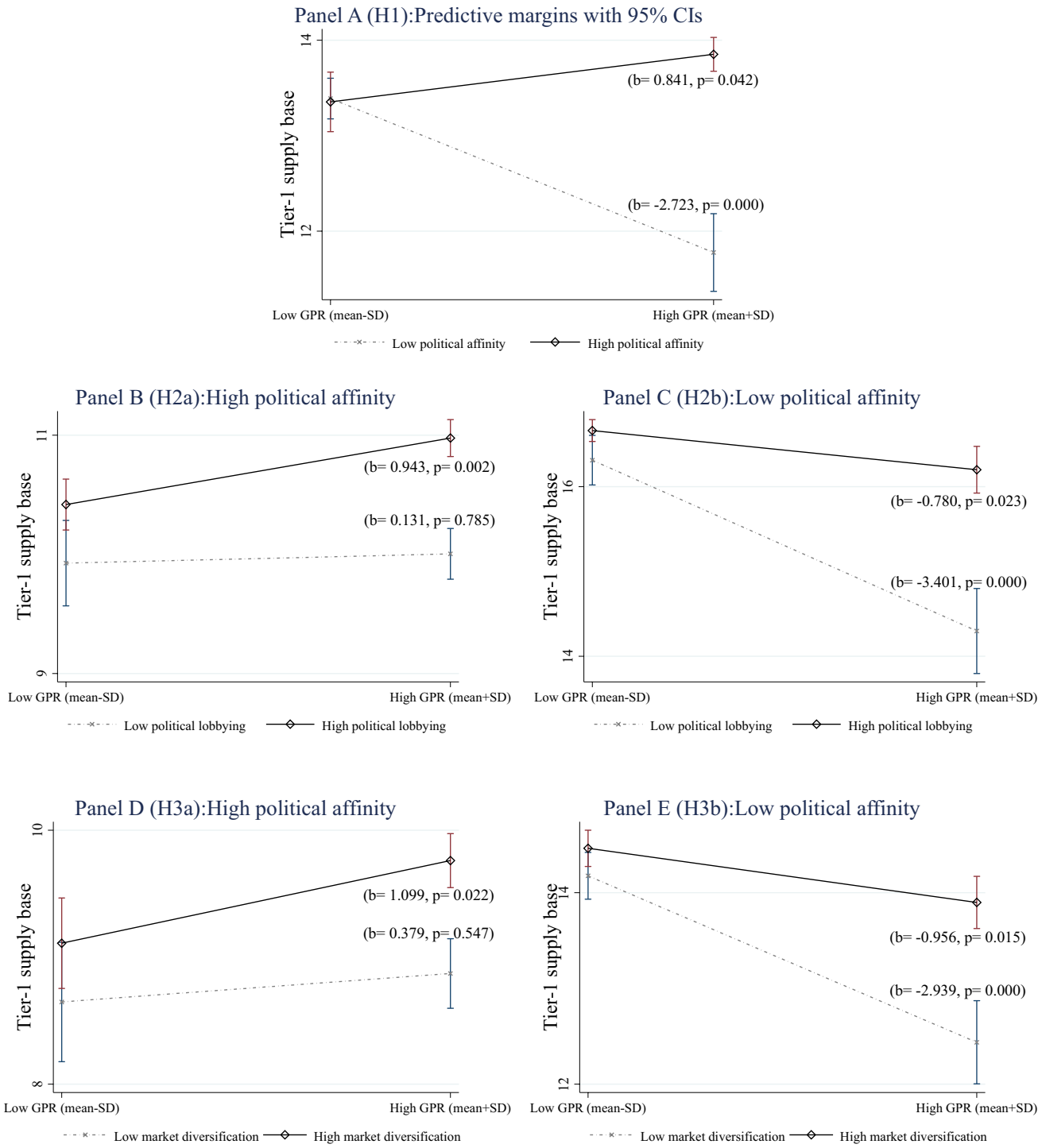


Fig. 2 Decomposing the interaction effects

From these events, we selected shocks in which at least one involved country was included in our sample of 43 host countries, resulting in 11 damaging geopolitical shocks (see Table 3).[7]

[7] Five geopolitical shocks are excluded: 2003/03, the beginning of the Iraq War; 2004/08, terrorist threats in New York and Washington; 2011/05, the US announces the death of Osama Bin Laden; 2013/08,

Table 3 Top damaging geopolitical shocks

No.	Date	Name	Country
1	2004/03	Assassination of Sheik Yassin, Middle East tensions	Israel versus Palestine
2	2005/07	London bombings 7/7	United Kingdom versus Iraq/Afghanistan
3	2006/08	Transatlantic aircraft plot	US/UK/Canada versus Islamist terrorists
4	2007/05	War and terrorism concerns, protests in Turkey	Turkey versus Terrorist Organization
5	2008/08	South Ossetian War escalation	Russia versus Georgia
6	2009/12	Flight 253 failed bombing attempt	Netherlands/US versus Terrorist Organization
7	2014/03-09	Russia invades Crimea, Escalation Ukraine/Russia	Ukraine versus Russia
8	2015/11	Paris terrorist attacks	France versus Syria
9	2016/07	Turkish coup attempt	Turkey versus Gülenist Terrorist Organization
10	2017/08	North Korea tensions	US/South Korea/Japan versus North Korea
11	2018/04	Syria missile strikes	US/France/UK versus Syria

We used the occurrence of the 11 damaging geopolitical shocks as the identification strategy for several reasons. First, these shocks occur independently of the actions of US MNCs, making them highly exogenous to US MNCs. Second, given their significant impacts, these events stand out as noteworthy occurrences that capture MNC managers' attention to GPR in the host country. Third, many of these shocks involve one country with a high political affinity to the US and the other with a low political affinity. As such, the 11 damaging geopolitical shocks provide an ideal natural experiment to examine how US MNCs adjust their supply base differently in response to GPR in countries with varying levels of political affinity to the US.

We examined how MNCs adjust their supply base in countries affected by shocks compared to those unaffected. Because MNCs coordinate supplier actions globally, a reduction in one country can lead to an increase in the other country, creating potential simultaneous causality, which violates the assumption of independence between the explanatory variable (geopolitical shocks) and the error term in regression analysis. To address this simultaneity bias, we employed a GMM model, which uses instruments (e.g., lagged supply base) that are uncorrelated with the error term but strongly linked to current supply base decisions. We measured geopolitical shock using a 2-year window (equal to 1 if the focal country experiences one of the 11 damaging geopolitical shocks in the past 2 years and 0 otherwise), because the effects of most damaging geopolitical shocks typically last for 1 or 2 years (Caldara & Iacoviello, 2022).

Table 4 presents the GMM results. As shown in Model 1, geopolitical shocks in a host country have a negative and significant impact on MNCs' first-tier supply base in that country ($b = -0.208$, $p = 0.040$), suggesting that when facing the most damaging geopolitical shocks, MNCs reduce their supply base in that country. As shown in Model 2, the two-way interaction term (i.e., geopolitical shock × political affinity) is positive and significant ($b = 2.379$, $p = 0.000$), supporting H1. In Model 3, the three-way interaction term (i.e., geopolitical shock × political affinity × political lobbying) is positive and significant ($b = 0.168$, $p = 0.010$), supporting H2. In Model 4, the three-way interaction term (i.e., geopolitical shock × political affinity × market diversification) is positive and significant ($b = 4.604$, $p = 0.001$), supporting H3.

Additional analysis

We further examined whether supply chain flexibility helps MNCs manage GPR. We used supplier switching rates, calculated by dividing the number of suppliers replaced in a given year by a firm's total number of suppliers, as an indicator of supply chain flexibility. Supplier switching rates reflect a firm's ability to change suppliers and reconfigure supplier networks (Wagner & Friedl, 2007). We examined the moderating effect of supply chain flexibility and found that the coefficient of the three-way interaction term (i.e., GPR × political affinity × supply chain flexibility) is positive and significant ($b = 0.042$, $p = 0.002$). This finding suggests that higher supply chain flexibility enhances the positive impact of GPR on MNCs' first-tier supply base in high-affinity host countries and mitigates the negative impact on the first-tier supply base in low-affinity host countries, making it a supply chain-specific capability in managing GPR.

Robustness tests

We conducted a series of robustness tests. First, recognizing the significant impact of COVID-19 on MNCs' global supplier decisions (Niu et al., 2025), we excluded the COVID-19 years (2020~2022 for the dependent variable) from our

Footnote 7 (continued)

the escalation of the Syrian Crisis; and 2020/01, the escalation of US/Iran tensions.

Table 4 The impact of top-damaging geopolitical shocks

DV.	Tier-1 Supply base$_{(t+1)}$									
Model #	(1)		(2)		(3)		(4)		(5)	
Geopolitical shock	− 0.208		− 0.494		− 0.480		− 0.443		− 0.442	
	(0.101)	[0.040]	(0.114)	[0.000]	(0.114)	[0.000]	(0.115)	[0.000]	(0.115)	[0.000]
Geopolitical shock × Political affinity **(H1)**			2.379		2.206		2.063		1.985	
			(0.446)	[0.000]	(0.450)	[0.000]	(0.452)	[0.000]	(0.454)	[0.000]
Geopolitical shock × Political affinity × Political lobbying **(H2)**					0.168				0.119	
					(0.065)	[0.010]			(0.068)	[0.081]
Geopolitical shock × Political lobbying					− 0.025				− 0.010	
					(0.017)	[0.157]			(0.018)	[0.572]
Political affinity × Political lobbying					0.048				0.044	
					(0.022)	[0.030]			(0.022)	[0.048]
Geopolitical shock × Political affinity × Market diversification **(H3)**							4.604		3.895	
							(1.414)	[0.001]	(1.470)	[0.008]
Geopolitical shock × Market diversification							− 1.152		− 1.091	
							(0.357)	[0.001]	(0.371)	[0.003]
Political affinity × Market diversification							0.434		0.229	
							(0.506)	[0.391]	(0.515)	[0.656]
Control variables	Yes		Yes		Yes		Yes		Yes	Yes
Year, industry, country FE	Yes		Yes		Yes		Yes		Yes	
Observations	69221		69221		69221		69221		69221	
Wald chi-square	4.4e+04		4.5e+04		4.5e+04		4.5e+04		4.5e+04	

Standard errors are reported in parentheses; *p* values are reported in square brackets (two-tailed)

sample to avoid potential contamination from the global pandemic (Model 1 in Table 5). Second, following prior literature that typically log-transforms indices for regression analyses (e.g., Baker et al., 2016), we used the log-transformed version of GPR index as an alternative measure for host-country GPR (Model 2 in Table 5). Third, we used an alternative measure of political affinity with media-based data on interstate conflict and cooperation from the Global Database on Event, Location, and Tone (GDELT, see https://www.gdeltproject.org) (Kim et al., 2025; Wang et al., 2021). Each event is assigned a score based on Goldstein's (1992) conflict-cooperation scale, which ranges from − 10 (most conflictual) to + 10 (most cooperative). Using these scores, we calculated the sum of Goldstein score for each US–host country pair in a year to capture political affinity (Model 3 in Table 5). Fourth, as economic policy uncertainty may relate to GPR, we excluded it from the analysis (Model 4 in Table 5). All the tests generated highly consistent results.

Discussion

Theoretical implications

Our research offers three major contributions. First, our research contributes to the PEP and IB literature by examining the influence of political risk on IB operations beyond the unilateral/bilateral level to the multilateral level (Li, et al., 2022; Luo & Van Assche, 2023). Unlike state-level political risk, which emanates from a specific state, and interstate-level political risk, which arises from tensions between home and host countries, GPR, being supranational in nature, wields influence at the multilateral and even global levels (Luo & Van Assche, 2023). However, despite the wide recognition of GPR's supranational nature, its influence on MNC operations has not been well understood or quantified by previous IB studies (Caldara & Iacoviello, 2022). Our research highlights the supranational characteristic of GPR and examines its impact on MNCs' operations, including those of third-party-country MNCs, by revealing the differential roles of GPR in host countries with high versus low political affinity. Consequently, we delve into a multilateral issue encompassing the focal host country in relation to its geopolitically conflicting countries, as well as the relationship between third-party MNCs' home and host countries. Furthermore, this study advances the PEP by examining how the interplay between two political systems—host-country GPR and home–host political affinity—jointly shapes MNCs' supply base decisions. In doing so, we extend the PEP beyond its traditional single-country focus to a supranational level of analysis, revealing how cross-border political dynamics influence MNCs' strategic choices.

Second, this study enriches the PEP by showing both the opportunities and threats of GPR. Previous studies have primarily viewed political risk as a threat, focusing on its negative effects on MNCs' cross-border operations (Dong et al., 2022; Fieberg et al., 2021). However, recent research has discussed the potential opportunities of political risk conceptually and called for identifying its opportunities and threats for MNCs (Lubinski & Wadhwani, 2020; Luo & Van Assche, 2023). In response, our study highlights the opportunities brought by GPR by proposing the critical role of political relationships between MNCs' home and host countries. We suggest that GPR presents transactional, relational, and legitimacy opportunities for MNCs in host countries with high political affinity, but poses transactional, relational, and legitimacy threats in host countries with low affinity. As a result, MNCs increase their supply base to capture the opportunities in the former condition, but decrease their supply base to avoid potential threats in the latter case. As such, our study represents an initial trial to incorporate home–host country political affinity in examining the impact of host-country GPR, and shows the differential roles of GPR in generating opportunities or threats for MNCs in countries with different levels of political affinity.

Third, this research advances the PEP by identifying firm-level capabilities that enable MNCs to leverage resources and seize opportunities arising from GPR, echoing Sun et al.'s (2021) call for IB research to uncover GPR-mitigating capabilities and enriching PEP's understanding of how firms actively navigate the political economy system. Recent studies have conceptually discussed potential strategies or capabilities for MNCs to hedge against GPR, such as employing geo-strategies to quantify and monitor their impact, engaging in corporate diplomatic activities to influence government policies, and maintaining flexibility (Luo & Van Assche, 2023). Extending this line of research, our study incorporates managerial levers specific to the interaction with the political economy by examining how political lobbying and market diversification help MNCs manage the impact of GPR on their supply base. Prior studies have shown that lobbying enables firms to hedge against state-level political risk and capitalize on political opportunities (Abdurakhmonov et al., 2022; Ridge et al., 2017). Extending this line of inquiry, our study suggests that lobbying the home-country government can help MNCs secure exemptions or special treatment, enabling them to manage the joint impact of host-country GPR and political affinity on their first-tier supply base. Moreover, previous literature has shown that market diversification enables MNCs to access new resources and customers across different markets (Patel et al., 2018; Tihanyi et al., 2005). Our findings further indicate that, due to its ability to capture opportunities in the host country, market diversification can strengthen the opportunity effect of high-affinity host-country GPR and

Table 5 Robustness tests

DV.	Tier-1 Supply base$_{(t+1)}$							
	Exclude COVID-19 year (2020–2022 for the dependent variable)		Take the logarithm of GPR index		GDELT event data measures political affinity		Drop economic policy uncertainty	
Model #	(1)		(2)		(3)		(4)	
GPR	− 0.329		− 0.615		− 0.528		− 0.447	
	(0.378)	[0.384]	(0.481)	[0.202]	(0.336)	[0.116]	(0.320)	[0.162]
GPR × Political affinity **(H1)**	1.777		2.239		0.062		1.400	
	(0.626)	[0.005]	(0.736)	[0.002]	(0.021)	[0.003]	(0.516)	[0.007]
GPR × Political affinity × Political lobbying **(H2)**	0.203		0.283		0.005		4.240	
	(0.089)	[0.023]	(0.100)	[0.005]	(0.003)	[0.038]	(1.575)	[0.007]
GPR × Political lobbying	− 0.014		− 0.032		− 0.024		− 2.160	
	(0.040)	[0.734]	(0.046)	[0.476]	(0.035)	[0.500]	(0.765)	[0.005]
Political affinity × Political lobbying	0.045		0.050		− 0.001		0.426	
	(0.028)	[0.105]	(0.023)	[0.028]	(0.001)	[0.468]	(0.516)	[0.409]
GPR × Political affinity × Market diversification **(H3)**	4.502		5.388		0.140		0.201	
	(1.938)	[0.020]	(2.233)	[0.016]	(0.065)	[0.032]	(0.071)	[0.004]
GPR × Market diversification	− 1.937		− 3.459		− 1.291		− 0.022	
	(0.935)	[0.038]	(1.095)	[0.002]	(0.842)	[0.125]	(0.032)	[0.485]
Political affinity × Market diversification	0.432		0.493		− 0.129		0.049	
	(0.609)	[0.478]	(0.517)	[0.340]	(0.029)	[0.000]	(0.022)	[0.028]
Political affinity	− 0.099		− 0.344		− 0.040		− 0.301	
	(0.497)	[0.842]	(0.379)	[0.364]	(0.011)	[0.000]	(0.378)	[0.425]
Political lobbying	− 0.009		− 0.006		− 0.010		− 0.006	
	(0.016)	[0.555]	(0.012)	[0.585]	(0.012)	[0.440]	(0.012)	[0.607]
Market diversification	− 0.407		− 0.391		− 0.470		− 0.393	
	(0.474)	[0.390]	(0.387)	[0.312]	(0.393)	[0.231]	(0.387)	[0.310]
Firm size	− 0.037		0.133		0.135		0.131	
	(0.171)	[0.827]	(0.126)	[0.292]	(0.126)	[0.284]	(0.126)	[0.298]
ROA	− 2.106		− 1.265		− 1.249		− 1.267	
	(0.701)	[0.003]	(0.550)	[0.021]	(0.549)	[0.023]	(0.550)	[0.021]
Financial leverage	0.388		0.621		0.597		0.620	
	(0.338)	[0.251]	(0.272)	[0.022]	(0.271)	[0.028]	(0.272)	[0.022]
Market-to-book ratio	− 0.003		− 0.003		− 0.003		− 0.003	
	(0.005)	[0.538]	(0.003)	[0.307]	(0.003)	[0.287]	(0.003)	[0.307]
Sales growth	− 0.070		− 0.165		− 0.171		− 0.164	
	(0.163)	[0.668]	(0.116)	[0.157]	(0.116)	[0.141]	(0.116)	[0.158]
Operational flexibility	0.013		0.012		0.012		0.012	
	(0.022)	[0.556]	(0.017)	[0.495]	(0.017)	[0.490]	(0.017)	[0.503]
Host-country experience	0.004		0.012		0.008		0.011	
	(0.024)	[0.856]	(0.014)	[0.393]	(0.014)	[0.555]	(0.014)	[0.419]
Supplier internationalization	46.432		44.962		45.004		44.971	
	(0.397)	[0.000]	(0.319)	[0.000]	(0.319)	[0.000]	(0.319)	[0.000]
Political stability	0.617		0.566		0.481		0.530	
	(0.294)	[0.036]	(0.212)	[0.008]	(0.211)	[0.022]	(0.212)	[0.013]
Economic policy uncertainty	− 0.204		− 0.117		− 0.085			
	(0.083)	[0.014]	(0.059)	[0.048]	(0.061)	[0.163]		
Cultural distance	1.560		0.197		0.159		0.206	
	(0.602)	[0.010]	(0.402)	[0.624]	(0.401)	[0.692]	(0.402)	[0.608]

Table 5 (continued)

DV.	Tier-1 Supply base$_{(t+1)}$							
	Exclude COVID-19 year (2020–2022 for the dependent variable)		Take the logarithm of GPR index		GDELT event data measures political affinity		Drop economic policy uncertainty	
Model #	(1)		(2)		(3)		(4)	
Geographic distance	− 0.007		− 0.024		− 0.024		− 0.024	
	(0.002)	[0.000]	(0.002)	[0.000]	(0.002)	[0.000]	(0.002)	[0.000]
Host-country GDP	0.534		1.245		1.123		1.328	
	(0.542)	[0.325]	(0.452)	[0.006]	(0.451)	[0.013]	(0.451)	[0.003]
Lagged tier-1 supply base	0.323		0.320		0.319		0.320	
	(0.011)	[0.000]	(0.009)	[0.000]	(0.009)	[0.000]	(0.009)	[0.000]
Constant	134.395		134.422		138.774		131.321	
	(22.327)	[0.000]	(22.320)	[0.000]	(22.306)	[0.000]	(22.298)	[0.000]
Year, industry, country FE	Yes		Yes		Yes		Yes	
Observations	45899		69221		69221		69221	
Wald chi-square	4.5e+05		4.5e+05		4.5e+05		4.5e+04	

Standard errors are reported in parentheses; *p* values are reported in square brackets (two-tailed)

weaken the threats posed by low-affinity host-country GPR on MNCs' first-tier supply base.

Managerial implications

While conventional wisdom suggests that MNCs should reduce their involvement in host countries with high GPR, we challenge this practice and suggest that MNCs should adopt distinct responses depending on the political affinity between their home and host countries. First, MNCs should understand that GPR may offer both opportunities and threats: When political affinity is high, MNCs should carefully evaluate the potential opportunities of GPR to adjust their supply base in the host country; Conversely, when political affinity is low, MNCs encounter substantial transactional and relational risks, along with potential illegitimacy from their home country. Accordingly, MNCs should exercise caution with their supply base in the host country and diversify their supply chains across multiple regions to mitigate the risk of supply chain disruptions.

Second, MNCs can employ lobbying to capitalize on home-country government resources and mitigate threats arising from GPR. For example, during the US–China trade war from 2018 to 2020, Apple successfully lobbied the US government to secure a tariff exemption on Mac Pro frame imports from China[8], thereby reducing the negative impact of GPR on its supply base in China. Hence, MNCs could enhance their political lobbying by broadening their lobbying breadth and diversifying lobbying tactics. For example, they can target multiple government departments and agencies that influence trade, foreign policy, and international regulations, or form industry coalitions to increase their lobbying influence.

Third, MNCs can increase their market diversification to navigate GPR. As market diversification improves MNCs' international knowledge, it plays a pivotal role in capitalizing on opportunities and protecting them from the threats posed by GPR in supply base decisions. Therefore, MNCs can increase their market diversification by strategically identifying high-potential markets for expansion and adopting multi-channel sales strategies. For example, they can leverage both e-commerce platforms and local partnerships to access a broad range of markets, thereby improving their cross-market capability to manage GPR.

Limitations and future research

This study presents several limitations that future research could address. First, our sample includes only publicly listed firms in the US, which may limit the generalizability of our findings. US firms are backed by a powerful government that wields substantial influence over the geopolitical landscape worldwide, providing them with distinctive risk mitigation strategies. However, MNCs from different countries encounter diverse geopolitical challenges and government-business dynamics, influencing their supply base decisions in response to GPR. For instance, Chinese MNCs,

[8] https://aublr.org/2019/10/apples-tariff-exemptions-and-their-effect-on-business-strategy/#_ftn13.

particularly state-owned ones, may mitigate supply chain risks by obtaining subsidies and loans, and benefiting from state-coordinated supply networks (Li, et al., 2022). These supports may amplify the opportunity effect of high-affinity host-country GPR. Given the absence of formal lobbying mechanisms in China, Chinese MNCs may instead cultivate political ties with government officials as an alternative political capability to manage GPR. European MNCs face restricted supplier selection due to stringent EU regulations, constraining their flexibility in responding to GPR. Consequently, political lobbying may be crucial for these MNCs to shape the regulatory framework and seize opportunities within the political system. Emerging market MNCs often operate with limited managerial expertise and home-country institutional resources, rendering them particularly vulnerable to supply chain risk. This vulnerability is compounded when their home governments lack geopolitical influence. Unlike MNCs from powerful states that can leverage strong intergovernmental relations to mitigate risks and capture opportunities, emerging market MNCs may find that political affinity yields limited opportunities in host countries with GPR. Thus, future studies could examine MNCs from different countries, such as China, Europe, and other emerging markets, and explore how they may manage GPR differently. Meanwhile, we focus on the impacts of two types of political factors: host-country GPR and home–host political affinity. Future research could consider additional political economy factors, such as the regulatory framework, economic policies, and government-business relations, and examine how they influence MNCs' supply base decisions.

Second, although host-country GPR reflects the aggregate level of geopolitical tensions faced by a specific country, the current measure may not fully capture its complexity, particularly its transmission across interconnected global networks. Also, the GPR index based on news coverage may not capture all nations affected by geopolitical events, leading to potential omission bias. Future research could employ alternative GPR measures (e.g., regional GPR index) and network-based analyses to capture its supranational nature. Meanwhile, while we use UN voting records to measure political affinity in the main study and adopt an alternative measure using media-based GDELT data, we acknowledge that these measures do not fully capture all facets of political affinity. Future research could integrate trade/investment data, historical geopolitical ties, and security alliances as additional measures of political affinity.

Third, we only examine political lobbying and market diversification as mitigating capabilities. Future research could explore the potential impacts of additional capabilities or strategies, such as financial slack, supply chain integration, or digital capability. For example, financial slack may grant MNCs the resources needed to explore opportunities and manage risks (Wiengarten et al., 2017). Supply chain integration may enable firms to manage unexpected disruptions and improve supply chain resilience (Jiang et al., 2024). Also, MNCs may leverage advanced digital technologies to manage value chain partners and mitigate GPR.

Fourth, we only focus on the impact of GPR on MNCs' first-tier supply base in the host country. However, MNCs' supply chain involvement extends to customer segments, transaction volume, production facilities investment, distribution networks, supply sustainability, etc. (Speier et al., 2011). Future research could explore the various aspects of supply chain involvement for a nuanced understanding of GPR's impacts on supply chain management. Meanwhile, as we only examine first-tier supply base adjustment of MNCs in response to GPR, we are uncertain about the performance outcomes of such adjustments. Future research is encouraged to further explore whether supply base adjustments can enhance MNCs' global performance. Related, due to data limitations, we are unable to assess the underlying mechanisms through which GPR affects MNCs' supply base, such as transaction opportunities/risks and relational or legitimacy factors. We encourage further research to use case studies or interviews to reveal additional insights.

Appendix

See Fig. 3.

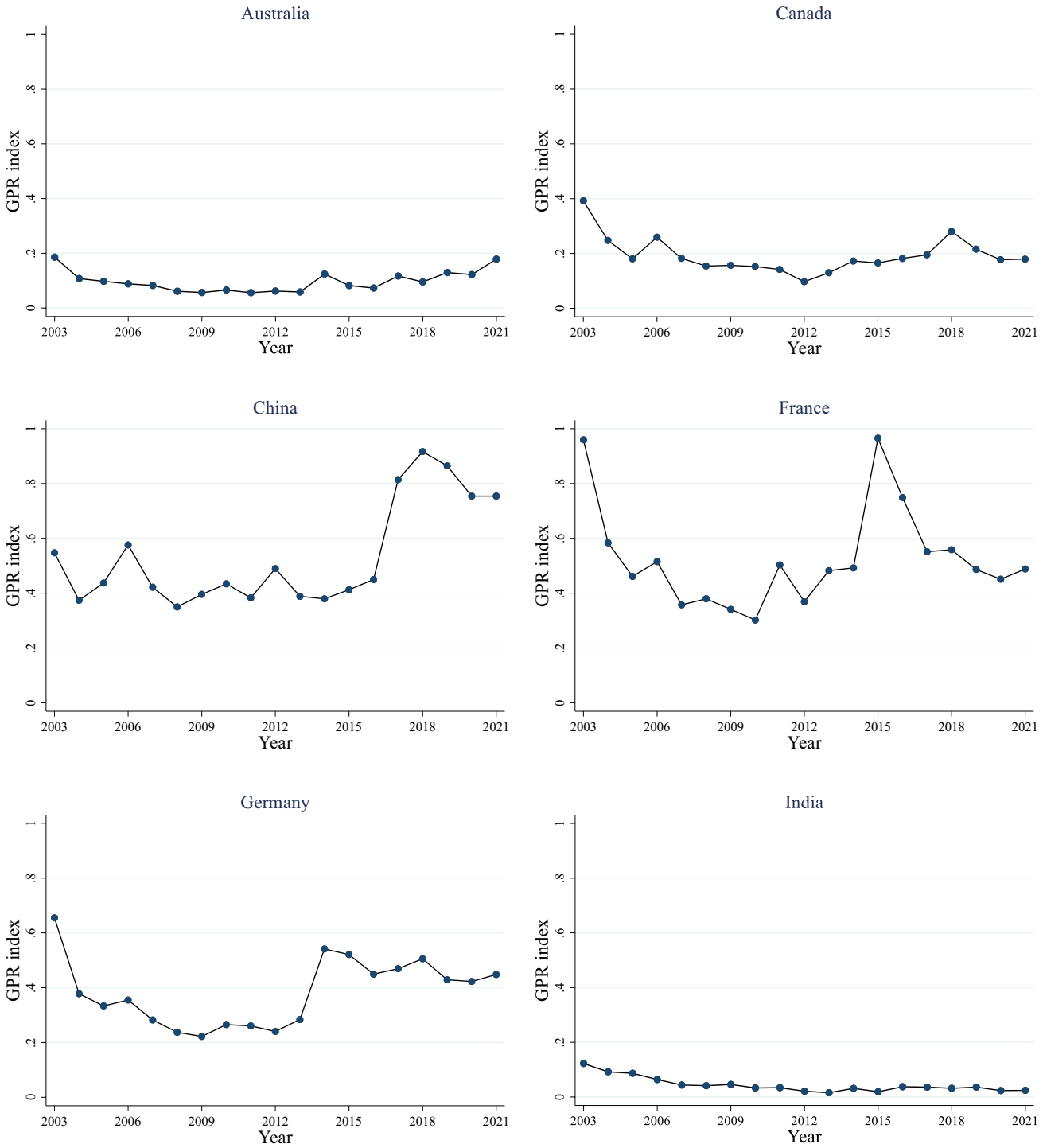


Fig.3 GPR index values for 12 major countries. Notes. The last two figures (the United Kingdom and the United States) are plotted on a (0, 5) scale, while the other figures are plotted on a (0, 1) scale.

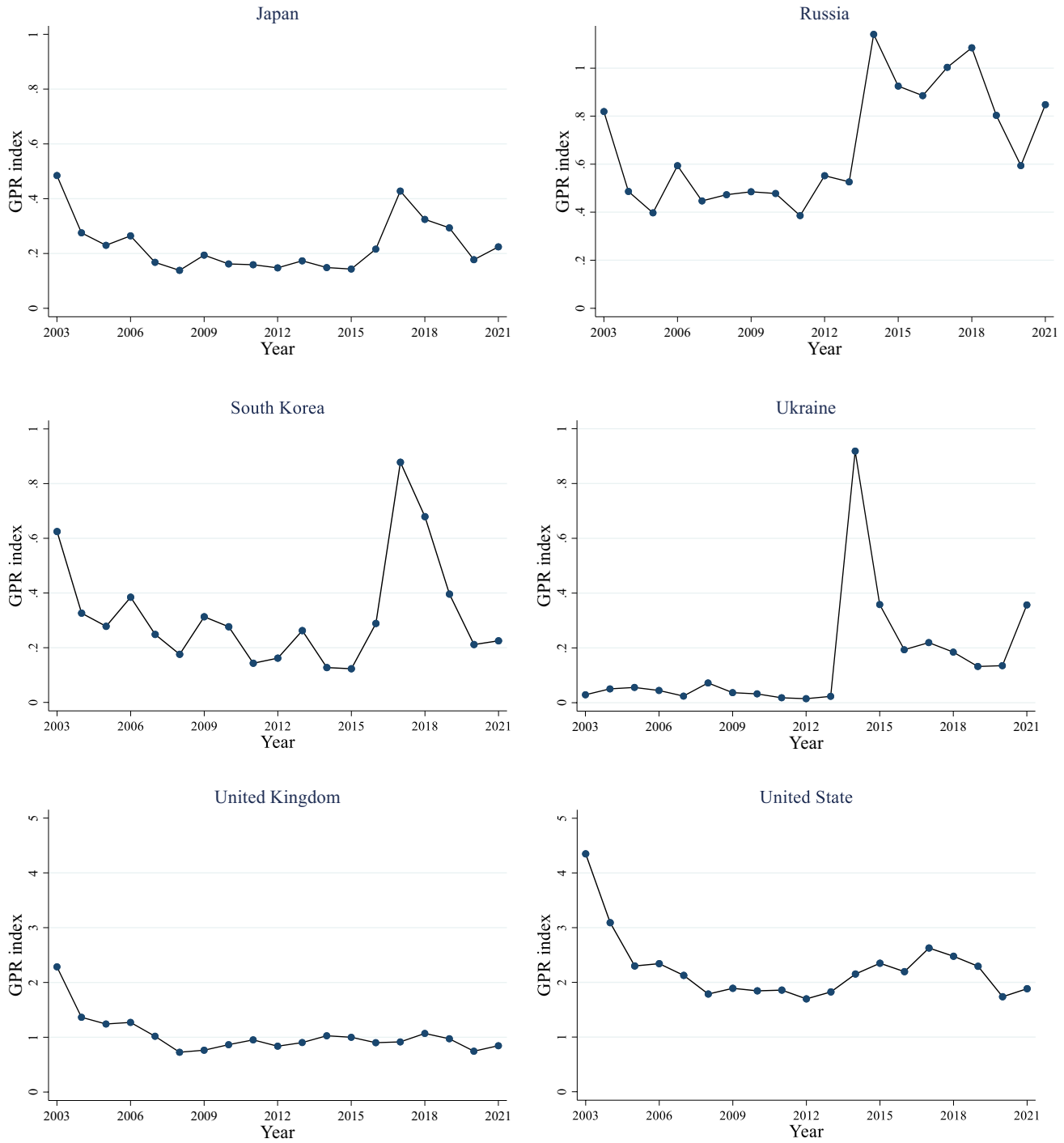


Fig.3 (continued)

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Data Availability Some datasets supporting this study's findings—including FactSet Revere and Compustat—are proprietary and were accessed via Wharton Research Data Services (WRDS) under license. Due to licensing restrictions, these data are not publicly available.

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