Geopolitical Risk and Global Banking *

Friederike Niepmann† Leslie Sheng Shen‡

March 2025

Abstract

This paper shows that geopolitical risk significantly affects the foreign operations of global banks, leading to spillover effects on domestic credit supply. Using multiple supervisory datasets and newly constructed geopolitical risk indices, we document that (i) geopolitical risk raises the credit risk of U.S. global banks; (ii) these banks continue lending through foreign branches and subsidiaries but reduce cross-border lending to high-risk countries; and (iii) this asymmetric response is unique to geopolitical risk. We explain these findings through a simple model of global banking, highlighting the interaction between banks' funding structure and expropriation risk in driving this asymmetry. Furthermore, we show this force generates significant spillover effects: global banks reduce C&I lending and tighten lending standards for domestic firms in response to rising geopolitical risk abroad, with stronger effects when their foreign affiliates are exposed.

Keywords: geopolitical risk, bank lending, credit risk, international spillovers

JEL-Codes: F34, F36, G21

*The authors thank Christian Blickle, Giovanni Dell'Ariccia, Camelia Minoiu, Andrea Presbitero, Andrei Zlate, and participants at the Federal Reserve Board internal seminar, CEPR & Kiel Institute Conference on Geoeconomics, CEPR Paris Symposium, ASSA Annual Meeting, NBER-TCER-CEPR TRIO Conference, BIS-BoE-ECB-IMF Spillover Conference, Junior Workshop in Geoeconomics, BSE Summer Forum, Stanford SITE Conference, and NFA Annual Meeting for helpful comments as well as Hannah Bensen, Isabel Culver, and Julian Perry for fantastic research assistance. The views in this paper are solely the responsibility of the authors and should not necessarily be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System, the Federal Reserve Bank of Boston, or any other person associated with the Federal Reserve System.

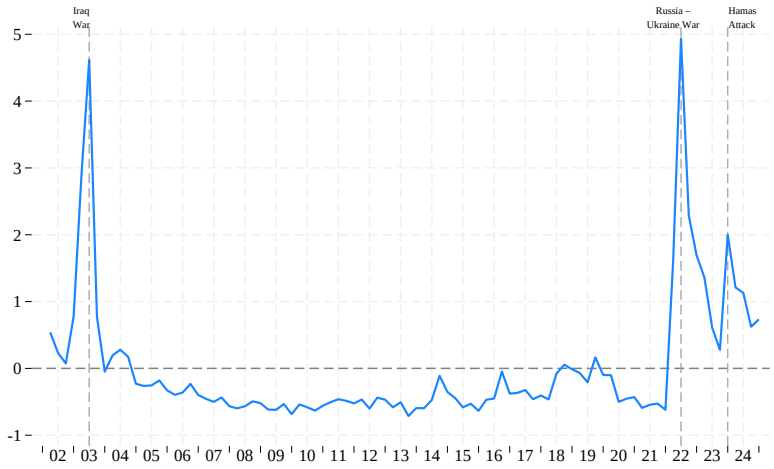
†Board of Governors of the Federal Reserve System; email: friederike.niepmann@frb.gov.

‡Federal Reserve Bank of Boston; email: lesliesheng.shen@bos.frb.org.

1 Introduction

Geopolitical risk has escalated in recent years, fueled by events such as Russia's invasion of Ukraine, heightened tensions between China and the West, and conflicts in the Middle East. Figure 1 illustrates the sharp increases in geopolitical risk using the geopolitical risk index constructed in this paper, derived from textual analyses of firms' earnings call transcripts.

Figure 1: Global Geopolitical Risk Index Based on Earnings Call Transcripts



Note: This figure presents the global geopolitical risk index, constructed using textual analysis of earnings call transcripts through the NL Analytics platform, covering the period from 2002:Q1 to 2024:Q3. The methodology for constructing the index is detailed in Section 2. The index is standardized by its standard deviation within the sample period.

The potentially adverse economic consequences of heightened geopolitical risk have become a top concern for policymakers and businesses.[1] However, the academic literature on this subject remains nascent. In particular, the financial and international mechanisms through which geopolitical risk affects economies are not well understood. This paper addresses this gap by analyzing how global banks navigate rising geopolitical risk. Operating across multiple countries, these banks are inherently exposed to geopolitical risks worldwide. At the same time, their credit supply decisions materially affect firm investment and employment (e.g., Peek and Rosengren 2000; Khwaja and Mian 2008; Schnabl 2012; Kalemli-Ozcan

[1]Geopolitical risk has frequently been raised in key central bank policy meetings and speeches since 2019. See the Federal Reserve's FOMC meeting minutes and Christine Lagarde's speech *Central Banks in a Fragmenting World* from April 17, 2023, for example. Similarly, in a speech in 2022, Jamie Dimon stated that "the most important [risk] is the geopolitics around Russia and Ukraine, America and China, relationships of the western world. That to [him] would be far more concerning than whether there is a mild or slightly severe recession."

et al. 2013; Huber 2018). Given their global reach, global banks can serve as a critical conduit for the propagation of geopolitical risk, including to countries not directly involved in international conflicts.

This paper focuses on internationally active U.S. banks to analyze how global banks are affected by and respond to geopolitical risk. Using both established and newly constructed country- and bank-level geopolitical risk indices, along with confidential supervisory data on U.S. bank lending spanning nearly four decades, we document three stylized facts about geopolitical risk and banks' foreign operations. First, rising geopolitical risk in countries where banks operate increases the credit risk of both their exposed loans and overall balance sheets. Second, despite heightened credit risk, banks continue lending through foreign branches and subsidiaries in high-risk countries while cutting cross-border lending from their headquarters. In other words, they maintain credit access through local operations but pull back direct cross-border operations.[2] Third, this asymmetric response is unique to geopolitical risk, as banks do not adjust foreign operations in the same way to other risk types.

We explain these findings through a stylized model that captures how banks' funding structures in cross-border versus local operations shape their incentives under geopolitical risk. In cross-border lending, banks raise funds domestically, while in local operations, a portion comes from foreign deposits. When geopolitical risk materializes, foreign deposits are not repaid, as seen in numerous historical cases where conflicts led to expropriation and government seizures of foreign bank assets. This creates an asymmetry in expected returns, driving banks to cut cross-border lending while maintaining local operations under geopolitical risk.

These dynamics also generate spillover effects on domestic credit supply. We find that U.S. banks reduce lending to domestic firms when geopolitical risk rises abroad, with the effect strongest when the risk originates in countries where banks operate through local affiliates. This underscores how the structure of foreign operations—local affiliates versus cross-border lending—shapes the transmission of geopolitical shocks. Our findings highlight the role of internationally active banks as key conduits of geopolitical instability.

[2]Banks can extend credit to foreign borrowers through two modes: from an office outside the borrower's country of residence (typically the bank's headquarters country), resulting in cross-border claims, or from an office located in the borrower's country, resulting in local claims.

We begin the analysis by compiling and constructing country-specific and bank-specific geopolitical risk indices (CGPR and BGPR, respectively) . For the former, we draw on the index provided by Caldara and Iacoviello (2022) for 44 countries, which is based on counting mentions of war and related terms in newspaper articles. Additionally, we construct a new CGPR index by applying textual analysis with similar terms to firms' earnings call transcripts, following the methodology outlined in Hassan et al. (2019, 2023) (as shown in Figure 1). The earnings call-based index enables us to focus on the geopolitical risks most salient to firms' perception and to distinguish between country-specific geopolitical risk arising from acts versus threats, a distinction not offered by the index from Caldara and Iacoviello (2022). Compared to other well-known measures of country risk (e.g., those in Hassan et al. 2019, 2023), we document that the geopolitical risk indices exhibit distinct patterns, capturing the realization and risk of geopolitical events.

Equipped with the CGPR indices, we construct BGPR indices that capture individual banks' exposure to CGPR through their foreign operations. Specifically, we calculate BGPR by multiplying a bank's share of assets in a given country by the CGPR index for that country and summing across all countries (excluding the United States). Data on banks' foreign exposures are derived from confidential FFIEC 009 reports submitted to the Federal Reserve. U.S. banks have substantial exposure to a wide range of countries, with significant cross-sectional and time-series variation in the magnitude of these exposures. Consequently, BGPR varies both across banks and within banks over time, providing the variation we exploit to identify the effects of geopolitical risk on banks.

Using the indices, we first examine the effects of geopolitical risk on banks' credit risk, using data from FR Y-14Q reports, which provide loan-level information on the amount and terms of commercial and industrial (C&I) lending by all banks participating in Federal Reserve stress tests. Based on regressions at the bank-country-time level, we find that the probability of default of loans to a country—as assigned by the banks—increases with rising geopolitical risk in that country. Additionally, we conduct an event study to validate this finding by examining two specific geopolitical risk shocks, the Crimea conflict in 2013:Q4 and the Russia-Ukraine war in 2022:Q1. Consistent with our prior findings, we show that, in response to the sharp rise in geopolitical risk in Russia following these events, the default

probabilities of loans to Russian borrowers increased significantly more than those of loans to borrowers from other countries. Building on these results, we further examine whether the increases in credit risk following adverse geopolitical risk shocks are substantial enough to materially affect banks' aggregate loan portfolios. Our analysis at the bank level reveals a significant increase in the aggregate probability of default for U.S. banks' loan portfolios as their exposure to foreign geopolitical risk rises. In other words, foreign geopolitical risk shocks significantly elevate the overall credit risk of U.S. banks' loan portfolios.

Next, we investigate how banks respond to the increases in credit risk using the FFIEC 009 data that contains detailed information on banks' foreign lending by country. We find that U.S. banks' responses differ by their mode of foreign operation. Using regressions at the bank-country level, we find that while banks reduce their cross-border claims to countries experiencing increasing geopolitical risk, their lending through local operations in these countries remains largely unchanged. In other words, banks' lending by foreign affiliates is highly persistent, despite the increase in credit risk. This finding is consistent with anecdotal evidence from Russia's invasion of Ukraine. More than three years after the initial invasion, Citigroup is still winding down its operations in Russia. Two large internationally active banks, Raiffeisen Bank International (RBI) and UniCredit, continue to operate in Russia to this day despite mounting political and regulatory pressure.

Banks' behavior in response to geopolitical risk appears distinct from their reactions to other risks. We examine how banks adjust their cross-border and local exposures to increases in broad country risk, using measures commonly employed in the literature, including the country risk index by Hassan et al. (2023), the World Uncertainty Index by Ahir et al. (2022), and sovereign CDS spreads. The first two measures, constructed using a methodology similar to our CGPR indices, capture broad perceptions of risk or uncertainty. Unlike geopolitical risk, which prompts banks to reduce cross-border lending while maintaining local operations, broad country and sovereign risk do not induce a similarly asymmetric adjustment, underscoring the unique nature of banks' responses to geopolitical instability.

To explain these empirical findings, we introduce a stylized model in which a bank decides how to allocate investment between domestic and foreign markets, with foreign investment taking one of two forms: cross-border or local affiliate operations. The key distinction is

that affiliates raise foreign deposits, which are not repaid if geopolitical risk materializes, as conflicts often entail expropriation in history. In such cases, the foreign government seizes the bank's local affiliate, absolving it of its obligation to repay foreign depositors. This asymmetric liability structure affects banks' incentives and shapes their responses to geopolitical risk, leading to differences in how they adjust cross-border versus affiliate-based exposures. Moreover, while geopolitical risk prompts banks to cut cross-border lending but maintain local operations, broad economic risks—despite potential losses—allow continued operations and require honoring foreign liabilities, leading to more uniform adjustments. The model also generates a new prediction: banks that rely more on foreign funding are less likely to divest from local investments in response to geopolitical risk. We confirm this empirically and further show that, unlike geopolitical risk, local funding positions do not significantly affect how banks adjust foreign exposures to other risks.

The model generates testable predictions on the spillover effects of geopolitical risk on domestic credit through global banks. Specifically, it predicts that banks facing heightened geopolitical risk abroad reduce domestic lending, with the effect strongest when the risk originates in markets where they operate through affiliates. To test these hypotheses, we first analyze the effect of geopolitical risk on banks' domestic corporate loan origination using FR Y-14 data and our BGPR indices. We conduct the analysis both at the loan level, which enables us to control for potential demand-side responses by firms using firm-time fixed effects, and at the bank level, to evaluate whether this effect is substantial enough to be observed in aggregate. Both analyses show that U.S. banks originate fewer loans to domestic firms in response to an increase in BGPR.

We further test and validate the role of banks' foreign exposure—through cross-border versus local claims—in driving these spillover effects. We decompose the BGPR indices into two components, one capturing BGPR from countries where banks operate only cross-border and another from countries where banks have local offices. Our findings indicate that the effects on loan origination are significant only for BGPR stemming from countries where banks maintain branches or subsidiaries, confirming the model prediction and aligning with the earlier finding on the persistence of local claims.

Additionally, we examine how banks' capital positions influence the spillover effects.

Consistent with the model prediction, banks with stronger capital positions reduce domestic lending less in response to rising geopolitical risk abroad. Finally, we find that the spillover effects are driven more by perceived threats than actual events, reinforcing the model framework and highlighting the role of uncertainty in transmitting geopolitical risk through banks.

Beyond loan origination, which is limited to less than 15 years of data, we assess whether the spillover effects of geopolitical risk hold over a longer time horizon using confidential bank-level responses from the Senior Loan Officer Opinion Survey (SLOOS), available since the 1980s. This survey captures banks' self-reported changes in credit standards—tightening or loosening—as well as shifts in credit demand. Our analysis shows that an increase in BGPR significantly tightens lending standards for domestic C&I loans, reinforcing the impact of foreign geopolitical risk on U.S. credit supply. Also, consistent with earlier findings, this effect is primarily driven by banks' exposure through local operations.

Our findings show that geopolitical risk abroad can have negative consequences for a country through the global operations of its domestic banks, leading to lower supply of bank credit at home. However, these findings should not be interpreted as evidence that the global nature of banks is detrimental to an economy merely because foreign shocks can be transmitted. The other side of this dynamic is that domestic shocks can be mitigated through international diversification. As such, shocks are naturally transmitted in both directions (Shen and Zhang 2024). Furthermore, the international banking literature highlights several benefits of cross-border banking. For instance, banks facilitate the efficient allocation of capital across countries (Niepmann 2015) and export advanced technologies to reduce the cost of financial services (Niepmann 2023).

Related Literature. A growing body of literature explores the economic and financial effects of geopolitical risk, following the seminal work by Caldara and Iacoviello (2022) who introduces the geopolitical risk index used in this paper. They show that heightened geopolitical risk reduces aggregate investment and employment. At the firm level, Wang et al. (2019) find that geopolitical risk lowers corporate investment. However, research on banks' responses to geopolitical risk remains limited. The most closely related study, Pham et al. (2021), finds that Ukrainian banks operating in the conflict-affected Luhansk and

Donetsk regions after 2014 reduced lending elsewhere in Ukraine. Other studies show that geopolitical risk constrains bank credit growth (Demir and Danisman 2021), weakens bank stability (Phan et al. 2022), and reduces profitability (Alsagr and Almazor 2020), primarily by curbing household lending. Related work also examines sanctions' effects on banks. Efing et al. (2023) find that German banks reduced lending to sanctioned countries from home offices but not necessarily from foreign branches. Mamonov et al. (2022) and Drott et al. (2024) study how banks adjust lending after being sanctioned.

Beyond banking, research on the economic effects of geopolitical power and risk has focused on the impact of geopolitical events—particularly the U.S.-China trade war—on global supply chains (e.g., Amiti et al., 2020, Fajgelbaum et al., 2020, Fajgelbaum et al., 2021, Alfaro and Chor, 2023). Clayton et al. (2023) develop a model explaining how geopolitical power and economic coercion shape global financial and real activity.

Beyond the literature on geopolitical risk, our paper aligns with research on the international transmission of shocks through global banks (e.g., Peek and Rosengren, 2000, Schnabl, 2012, Cetorelli and Goldberg, 2012, Ivashina et al., 2015, Hale et al., 2020, Shen and Zhang, 2024). Methodologically, we are similar to Temesvary and Wei (2024), who show that U.S. banks with greater exposure to foreign markets affected by COVID reduced domestic C&I lending more sharply. Several studies examine how international uncertainty affects bank lending. Correa et al. (2023) analyze how U.S. banks' exposure to trade uncertainty through their borrowers influences credit supply, while Federico et al. (2023) show that rising trade uncertainty leads to a broad contraction in lending, regardless of firm-specific uncertainty. Cross-border shock transmission also depends on banks' mode of foreign operations. Fillat et al. (2023) find that transmission is stronger through branches than subsidiaries due to differences in funding structures. Similarly, Dell'Ariccia and Marquez (2010) argue that the higher expropriation risk faced by subsidiaries makes this mode less attractive in politically unstable countries. Instead of focusing on the branch-subsidiary distinction, our paper highlights the broader role of cross-border versus local affiliate lending, with the latter encompassing both branches and subsidiaries, in driving spillover effects.

Our paper also contributes to the literature on risk and capital flows (e.g., Rey, 2016, Kalemli-Özcan, 2019, Jiang et al., 2020, Akinci et al., 2022). Hassan et al., 2023 construct

country risk measures from firms' earnings transcripts, showing that heightened risk reduces capital flows. We build on this approach, applying similar textual analysis to develop a new geopolitical risk measure. Several studies examine how risk affects cross-border bank lending (e.g., Correa et al., 2022, Bruno and Shin, 2015). Choi and Furceri (2019) find that rising country-level uncertainty reduces both cross-border lending and borrowing from affected countries.

2 U.S. Banks' Exposure to Geopolitical Risk

2.1 U.S. Banks' Foreign Operations

U.S. banks are exposed to geopolitical risk abroad through their foreign operations. To understand the extent of this exposure, we examine data from the FFIEC 009 report, which provides detailed information on U.S. banks' foreign assets and liabilities by country.[3] The FFIEC 009 reporters consist of U.S. banks, bank holding companies (BHCs), and intermediate holding companies (IHCs) holding $30 million or more in claims on residents of foreign countries. We focus on reporters whose ultimate parent bank is in the United States, relying on information from the National Information Center to identify each reporter's ultimate parent bank and its location. Our sample runs from 1986:Q1 to 2022:Q4 and consists of 67 banks in an average time period.

Figure 2 illustrates the size, mode, and geographical distribution of U.S. banks' foreign operations. Panel (a) of Figure 2 shows that the share of U.S. banks' foreign assets in total assets averages around 20 percent over the sample period. The larger banks tend to be the most internationally active (Buch et al., 2011, Niepmann, 2023), contributing disproportionately to this aggregate share.

Panel (b) illustrates the mode of U.S. banks' foreign operations. It displays the share of foreign exposures held in foreign offices (either branches or subsidiaries), referred to as local exposures. The remaining share, known as cross-border exposures, represents the share of foreign exposures where the U.S. parent offices directly lend to foreign residents.[4]

[3] In this paper, the terms 'foreign claims,' 'foreign exposures,' and 'foreign assets' are used interchangeably.

[4] To be more precise, cross-border exposures are claims held by offices of a bank that are outside of the

The figure shows that approximately half of U.S. banks' operations are conducted through offices abroad, while the other half comprises cross-border operations. The share of foreign operations conducted through local operations increased up to the Global Financial Crisis and declined to around 45 percent in the subsequent years.

Panels (c)–(f) of Figure 2 provide snapshots of the geographical distribution of U.S. banks' foreign operations around the world. Panels (c) and (d) display the kernel density of the share of foreign operations across four regions—Europe, Asia, Latin America, and the rest of the world—in 2010:Q4 and 2019:Q4, respectively, across U.S. banks. Across all regions, there is significant heterogeneity in the extent of exposure among banks. For example, in 2010:Q4, roughly the same number of banks had nearly zero exposure as had 60 percent of their total exposure to Europe. Moreover, this degree of heterogeneity changes over time. By 2019:Q4, fewer banks had more than 60 percent of their exposure in Europe.

Panels (e) and (f) further provide more granular snapshots of the geographical distribution of foreign claims for selected banks, displaying their top five countries of exposure in 2010:Q4 and 2019:Q4, using the public version of the FFIEC 009/009a data.[5] These snapshots reveal substantial variation across banks in both the geographical composition and the magnitude of their foreign exposure. Moreover, both the origins and magnitudes of exposure shift over time within individual banks, reflecting the fluid nature of foreign banking operations.

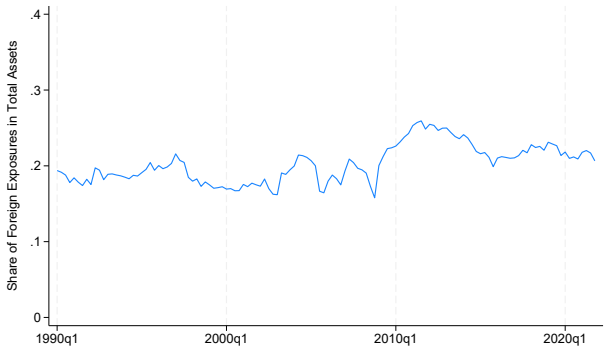
Overall, Figure 2 demonstrates that U.S. banks have substantial exposure to a diverse range of countries worldwide, with a significant portion of this exposure stemming from their operations within these countries. These foreign operations expose them to geopolitical risks globally. Moreover, since the origin and magnitude of these exposures vary markedly among banks, there is considerable variation in their exposure to geopolitical risk, and this variation

country of residence of its counterparty. For example, U.S. Bank A generates a cross-border claim on Mexico when it extends a loan from its U.S. office to a Mexican resident. Local exposures are claims extended by a bank's local offices, whether they are subsidiary or branch, in a foreign country to residents of that country. For example, Bank A generates a local claim on Russia when it lends to a Russian resident through its Russian subsidiary.

[5]The public version of the FFIEC 009/009a data provides information on material foreign country exposures, defined as exposures exceeding 1 percent of total assets or 20 percent of capital, whichever is lower, for U.S. banks filing the FFIEC 009 report. Reporting institutions must also disclose a list of countries where their lending exposures exceed 0.75 percent of total assets or 15 percent of total capital, whichever is lower.

Figure 2: U.S. Banks' Foreign Operations

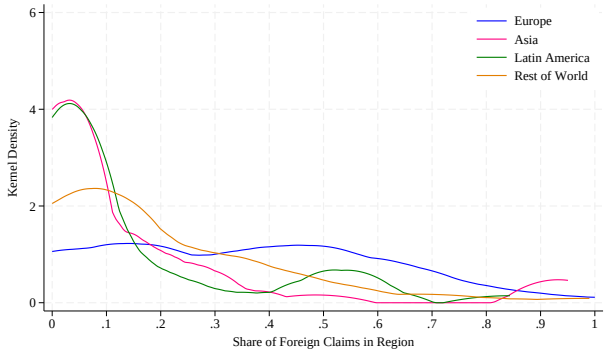
(a) Foreign Exposures as a Share of Total Assets



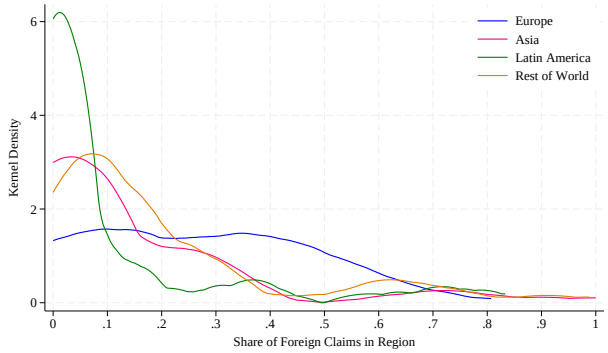
(b) Local Exposures as a Share of Foreign Exposures



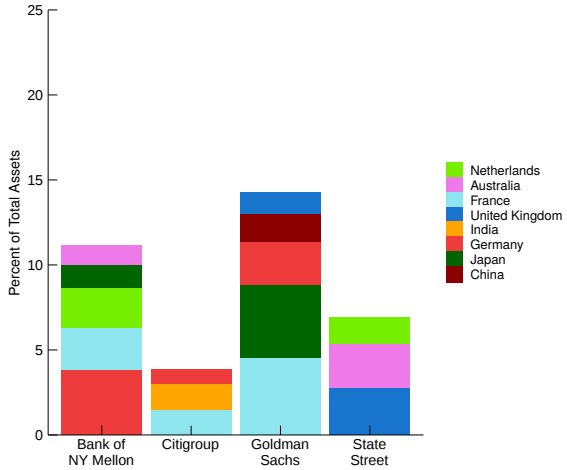
(c) Distribution of Foreign Exposure by Region, 2010:Q4



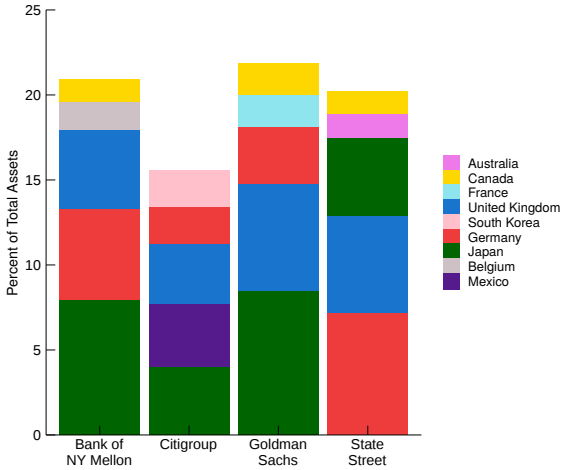
(d) Distribution of Foreign Exposure by Region, 2019:Q4



(e) Distribution of Foreign Claims by Country for Selected Banks, 2010:Q4



(f) Distribution of Foreign Claims by Country for Selected Banks, 2019:Q4



Note: Panel (a) of the figure shows U.S. banks' average foreign exposures as a share of total assets from 1990:Q1 to 2021:Q4. Panel (b) shows U.S. banks' local exposures, or exposures through foreign offices, as a share of their total foreign exposures. Panels (c) and (d) illustrate the kernel density of the share of foreign operations in four regions—Europe, Asia, Latin America, and the rest of the world—in 2010:Q4 and 2019:Q4, respectively, across U.S. banks. Panel (e) and (f) illustrate the top countries by foreign claims size (expressed as a share of total assets) in 2010:Q4 and 2019:Q4, respectively, for four selected U.S. banks. Data source(s): FFIEC 009, FR Y9-C, and Call Reports for Panels (a)–(d); public version of FFIEC 009/009a for Panels (e)–(f).

also changes over time with bank. These cross-sectional and time-series variations in foreign exposure are incorporated into the bank-specific measures of geopolitical risk we subsequently construct and play a key role in our identification strategy applied in the empirical analysis.

2.2 Constructing and Dissecting Geopolitical Risk Indices

Constructing BGPR index. To measure the extent of U.S. banks' exposure to geopolitical risk through their foreign operations, we construct a bank-specific geopolitical risk (BGPR) index. This index captures the geopolitical risk each bank faces based on the geography of its foreign lending activities. For each bank b and quarter t, we calculate the index by weighting the geopolitical risk of country c (CGPR) by the share of the bank's total assets exposed to that country. We then sum the weighted CGPR indices over all countries. Specifically, we compute:

$$BGPR_{bt} = \sum_{c} \omega_{bct-1} CGPR_{ct}, \tag{1}$$

where

$$\omega_{bct-1} = \frac{1}{4}\left(\sum_{i=1}^{4} \frac{exp_{bct-i}}{\sum_c asset_{bct-i}}\right),$$

and exp_{bc} denotes bank b's total exposure in country c, encompassing both cross-border and local claims that the bank has toward the residents of the respective country.

The BGPR index, as defined in Equation (1), is more sensitive to changes in geopolitical risk in country c when bank b has a larger operation in that country.[6]

CGPR indices. A key component of the BGPR index is CGPR, for which we use two measures. The first is the geopolitical risk indices from Caldara and Iacoviello (2022), who construct a measure of country-specific geopolitical risk for 44 countries (including the United States). We use the authors' recent CGPR indices, which are based on ten newspapers and begin in 1985, rather than the "historical" indices, which are based on three newspapers

[6]In the empirical analysis, we also use variants of this index to assess the robustness of our results. We alter the way of computing the weights (ω_{bct}) by normalizing the exposure of bank b in a country by total foreign claims (instead of total assets), and using one-quarter lagged exposure shares as weights (instead of averaging bank exposure shares over the previous four quarters). When normalizing by total foreign claims, we use exposure to all 43 foreign countries for which the CGPR index from Caldara and Iacoviello (2022) is available.

and available from 1900 onward. This set of indices capture perceptions of geopolitical risk from media coverage, reflecting how geopolitical events are reported and emphasized across different news sources over time. We denote the CGPR index from Caldara and Iacoviello (2022) as $CGPR^N$.

We construct a second measure of CGPR to capture firms' perceptions of geopolitical risk, building on the natural language processing method from Hassan et al. (2019, 2023). This approach uses the NL Analytics platform, developed by the authors' team, to apply textual analysis to nearly 400,000 earnings call transcripts from about 14,000 public companies worldwide, starting in 2002. A crucial step in constructing the CGPR indices involves identifying instances where conference call discussions specifically focus on geopolitical risk in particular countries. To do this, we compile a dictionary of words associated with geopolitical threats and actions, along with a database of terms identifying the 43 foreign countries of interest, primarily major cities. To count toward our measure of geopolitical risk for a given country, words from both sets must appear in the same sentence. The dictionary of geopolitical risk-related words is extracted from Caldara and Iacoviello (2022) to allow for a close alignment with $CGPR^N$. Appendix Table A.1 lists the search query for geopolitical risk, which are organized into eight categories. Following Caldara and Iacoviello (2022), each category includes a search query consisting of two sets of words: the first set contains topic words (e.g., "war," "military," "terrorist"), and the second set contains "threat" words for five categories and "act" words for three categories.

Specifically, we construct the CGPR index based on earnings call transcripts, denoted as $CGPR^T$, as follows:

$$CGPR^T_{ct} = \frac{1}{F_{ct}} \sum_f \frac{GPRCount_{fct}}{N_{ft}},$$

where $GPRCount_{fct}$ denotes the number of geopolitical risk-related sentences in the transcript of firm f pertaining to country c at time t, N_{ft} denotes the total number of sentences in the earnings call transcript of firm f at time t, and F_{ct} denotes the number of firms in country c at time t. The construction of the index is designed to be flexible, enabling closer examinations of various dimensions of geopolitical risk for a given country. For instance, we decompose the index into two components: geopolitical risk arising from threats

($CGPR_{ct}^{T(Threat)}$) and from acts ($CGPR_{ct}^{T(Act)}$). We also construct a sub-index specifically focused on the geopolitical risk perceived by financial firms ($CGPR_{ct}^{Tfin}$).

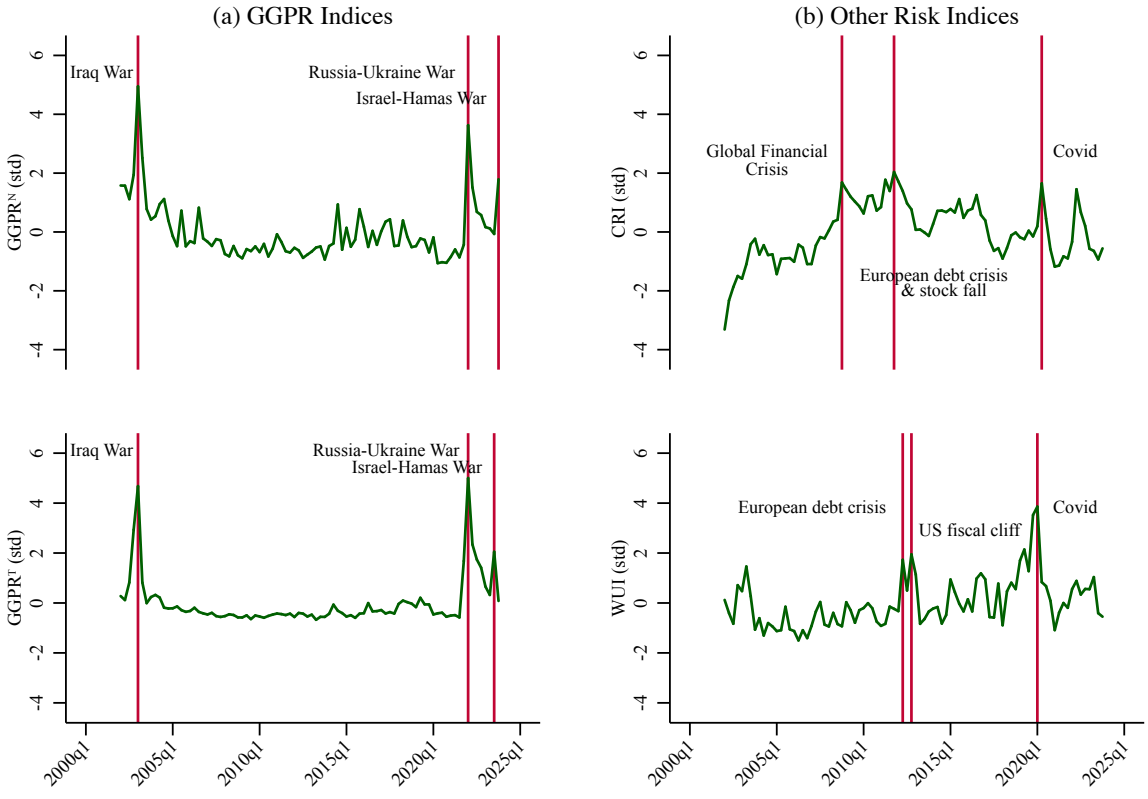
We construct BGPR indices using both $CGPR^N$ and $CGPR^T$. Indices based on $CGPR^N$ serve as our baseline measure of geopolitical risk due to their longer sample period starting in 1985. Indices based on $CGPR^T$ are used to assess the robustness of our results and to further explore how the components of geopolitical risk drive these results, utilizing the various sub-indices of $CGPR^T$ that we construct.

Panel (a) of Figure 3 shows the two CGPR indices, aggregated to the global level (GGPR) and normalized by their respective standard deviations within the sample, from 2002:Q1 to 2023:Q4. $GGPR^N$ (top) and $GGPR^T$ (bottom) both spike around the onset of three major geopolitical events: the Iraq War in 2003:Q1, the Russia-Ukraine War in 2022:Q1, and the Israel-Hamas War in 2023Q4. We compare these geopolitical risk indices to two well-known risk indices: the country risk index (CRI) by Hassan et al. (2023) and World Uncertainty Index (WUI) by Ahir et al. (2022). The former is a measure of broad risk perception constructed using the same data and methodology as our $CGPR^T$ index; the WUI is a measure of uncertainty constructed by counting the frequency of synonyms for risk or uncertainty using the country reports of the Economist Intelligence Unit. As shown in Panel (b) of Figure 3, both CRI and WUI primarily spike during periods of significant economic uncertainty, including the height of the Global Financial Crisis around 2008:Q4, the peak of the European sovereign debt crisis in 2011, and the onset of COVID-19 in 2022:Q1. The correlations between the GGPR indices and these two broad risk indices are either low or negative, suggesting that the geopolitical risk captured by $CGPR^N$ and $CGPR^T$ is a distinct form of risk.

We further examine the CGPR indices and compare them to other risk indices at the country level. Appendix Figure A.1 shows these indices for three countries: Poland (Panel (a)), the United Kingdom (Panel (b)), and South Korea (Panel (c)). Charts in the left panel illustrate $CGPR^N$ (top), $CGPR^T$ (middle), and $CGPR^{T(Fin)}$ (bottom), while the right panel displays three broad risk indices for these countries: CRI, WUI, and 5-year sovereign CDS spreads. Similar to the aggregated global indices, the CGPR indices show sharp increases around significant adverse geopolitical events, including the Russia-Ukraine

War that started in 2022 for Poland, a series of terrorist incidents in London in 2005 and 2007 for the United Kingdom, and periods of heightened geopolitical tensions in South Korea due to North Korea's withdrawal from the Nuclear Nonproliferation Treaty in 2003 and missile tests in 2017. Notably, many of these events are specific to the respective country rather than global (e.g., the CGPR indices for South Korea did not spike with the outbreak of the Russia-Ukraine War). In contrast, the broad risk indices for these countries primarily spike during major economic crises, many of which are global. These examples further highlight that our geopolitical risk indices capture a distinct form of risk.

Figure 3: Global Geopolitical Risk and Other Risk Indices



Note: Panel (a) shows two global geopolitical risk (GGPR) indices, which are aggregated from country-specific geopolitical risk (CGPR) indices, covering the period from 2002:Q1 to 2023:Q4. The top chart displays GGPR from Caldara and Iacoviello (2022) ($GGPR^N$), and the bottom chart displays GGPR constructed by applying textual analysis to earnings call transcripts using the NL Analytics platform ($GGPR^T$). Panel (b) shows the aggregated country risk index (CRI) by Hassan et al. (2023) (top), and the World Uncertainty Index (WUI) by Ahir et al. (2022) (bottom). All the indices are standardized by their respective standard deviations within the sample.

Based on Equation (1), we construct BGPR indices using $CGPR^N$ and $CGPR^T$, produc-

ing $BGPR^N$ and $BGPR^T$, respectively. Appendix Figure A.2 illustrates these two indices at the 25th, 50th, and 75th percentile over time. The differences among these percentiles reveal significant variation in the level of the index across banks, driven by the heterogeneity in the geography of U.S. banks' foreign operations. Furthermore, these cross-sectional differences evolve substantially over time across banks.

2.3 Additional Data Sources

Given that the goal of our analysis is to understand the effect of geopolitical risk on U.S. banks' foreign and domestic operations, we need to construct variables that capture the outcomes of interest. To do this, we utilize a variety of regulatory datasets collected by the Federal Reserve.

Bank foreign exposure by country. We use the FFIEC 009 data, which were also used to construct our geopolitical risk indices, to capture the margins of foreign exposure adjustment in response to geopolitical risk. These margins of adjustment include exposure through cross-border and local claims.

Loan-level data. For more granular information on U.S. banks' foreign and domestic operations, we use quarterly loan-level data from the FR Y-14 reports. These reports have been filed confidentially by all BHCs participating in official Federal Reserve bank stress tests since late 2012. The participating institutions report detailed information on individual C&I loans exceeding $1 million, including the borrower's name, country, and industry, as well as the loan amount, origination date, and the probability of default assigned by the bank.[7] The probability of default information allows us to study how geopolitical risk affects U.S. banks' assessment of credit risk for exposed loans. Additionally, the loan origination data enables us to analyze the transmission of geopolitical risk to domestic lending.

[7] Of note, this dataset includes loans extended through banks' foreign offices, including foreign subsidiaries. However, we cannot distinguish between loans held by the parent bank and those held by foreign subsidiaries. As a result, we are unable to separate loan exposures into cross-border and local exposures in this dataset.

Bank lending standards. We use data from the Federal Reserve's Senior Loan Officer Opinion Survey (SLOOS) to construct additional outcome variables related to U.S. banks' lending standards. In the quarterly survey, the Federal Reserve asks banks about changes in their lending standards and the demand for credit over the previous three months. The aggregate results are published on the Federal Reserve's website, while bank-level responses are available to researchers in the Federal Reserve System from 1990 onward. Banks' responses are recorded on a scale from one to five. Following standard practice in the literature, we transform these responses into three outcome categories: 1 = loosening, 0 = unchanged, and -1 = tightening. To map SLOOS reporters with corresponding FFIEC 009 reporters, we identify whether a SLOOS-reporting entity is a subsidiary of a BHC that reports the FFIEC 009. If so, we aggregate the responses of all loan officers within that BHC. We focus on lending standards for C&I loans to large and medium-sized enterprises, in line with the predominant loan composition in the FR Y-14 data.

Bank balance sheet information. We supplement our database with quarterly balance sheet data from FR Y-9C and Call Reports, which provide detailed information on the income statements and balance sheets of all U.S. banks. Using these data, we construct a set of bank-level control variables for our regressions, including a bank's Tier 1 capital ratio and liquid-asset ratio.[8]

Macro, financial and other data. In addition to bank-level information, we construct country-level macro and financial variables from a variety of data sources for use as control variables. This includes countries' stock price indices and exchange rates from Bloomberg, sovereign CDS spreads from IHS Markit, and sanction status from the Global Sanctions Database. A list of variables used in this paper, along with their data sources, can be found in the data appendix.

[8]The liquid asset ratio is calculated as (Cash and Balances Due from Depository Institutions + Available-for-sale Debt Securities + Held-to-maturity Securities at Amortized Cost) / Total Assets.

3 Geopolitical Risk & U.S. Banks' Foreign Operations

In this section, we examine how geopolitical risk abroad affects banks' foreign exposures and how they adjust these exposures in response. We document three new facts: (i) geopolitical risk increases the credit risk of U.S. banks with foreign operations; (ii) these banks continue to lend to countries experiencing heightened geopolitical risk, despite rising credit risk, through their branches and subsidiaries, while reducing cross-border lending to these countries; and (iii) banks do not adjust their foreign exposures in the same way in response to other types of risk.

3.1 Geopolitical Risk and Credit Risk

When geopolitical risk in a country increases, the credit risk associated with banks' claims on that country is likely to rise as well. In response, banks are expected to assign a higher probability of default to their exposures to borrowers from that country. We begin our analysis by testing this conjecture, using data from the FR Y-14 reports for the sample period 2013:Q1 to 2022:Q4.

Bank-country level evidence. We first conduct the analysis at the bank-country level. Using the quarterly FR Y-14 data, we compute the average probability of default (PD) of C&I loans to country c held by bank b at time t. The PDs are weighted by loan size, using the committed loan amounts. To isolate changes in the probability of default for existing loans—rather than shifts driven by banks originating safer loans, we exclude loans originated in quarter t.

With the weighted-average PD variable, we study the relationship between CGPR indices and credit risk at the bank-country-time level using the specification:

$$ln(PD_{bct}) = \beta CGPR_{ct} + \alpha_{bt} + \alpha_{bc} + \epsilon_{bct}, \tag{2}$$

where PD_{bct} denotes the weighted average probability of default assigned by bank b to loans to residents of country c at time t, $CGPR$ denotes $CGPR^N$ or $CGPR^T$, and α_{bt} and α_{bc} stand for bank-time and bank-country fixed effects, respectively. Standard errors are clustered at

the country-time level.

Table 1: Geopolitical Risk and Credit Risk

	Bank-country Level		Bank Level	
$ln(PD_{bct/bt})$	(1)	(2)	(3)	(4)
$CGPR^N_{ct}$	0.100**			
	(0.040)			
$CGPR^T_{ct}$		0.076**		
		(0.032)		
$BGPR^N_{bt}$			0.134***	
			(0.024)	
$BGPR^T_{bt}$				0.215***
				(0.042)
Bank-country FE	Yes	Yes	No	No
Bank-time FE	Yes	Yes	No	No
Bank FE	No	No	Yes	Yes
Time FE	No	No	Yes	Yes
Observations	9588	8890	411	411
R^2	0.680	0.679	0.871	0.871

Note: This table reports regressions with log average weighted probability of default (PD) as the dependent variable using data from FR Y-14 for the sample period 2013:Q1 to 2022:Q4. Columns (1)–(2) report results from regressions at the bank-country-time level based on Equation (2). $CGPR^N$ denotes the (recent) country-specific geopolitical risk index from Caldara and Iacoviello (2022). $CGPR^T$ denotes the country-specific geopolitical risk index constructed based on earnings call transcripts using the NL Analytics platform. Columns (3)–(4) report results from regressions at the bank-time level based on Equation (4). $BGPR^N$ and $BGPR^T$ denote the bank-specific geopolitical risk indices based on $CGPR^N$ and $CGPR^T$, respectively. All the geopolitical risk indices are standardized by their respective standard deviations within the sample. Standard errors, shown in parentheses, are clustered at the country and time level in Columns (1)–(2) and the bank and time level in Columns (3)–(4). $^*p < .1$; $^{**}p < .05$; $^{***}p < .01$.

Columns (1)–(2) of Table 1 present the results. Banks assign higher probabilities of default to existing loans made to borrowers in countries with increasing geopolitical risk, as measured by either $CGPR^N$ or $CGPR^T$. A one-standard-deviation increase in $CGPR$ raises the weighted average probabilities of default of these loans by 8 to 10 percent. These results support the conjecture that banks perceive higher credit risk in loans to borrowers from countries facing rising geopolitical risk.

Event study. To further investigate how banks adjust their assigned probabilities of default in response to increasing geopolitical risk, we conduct an event study focused on Russia's annexation of Crimea in 2013:Q4 and its invasion of Ukraine in 2022:Q1. These two major geopolitical shocks provide a natural setting to analyze how banks reassess the credit risk of

their outstanding exposures to Russia relative to other countries.

Specifically, we run the regression:

$$ln(PD_{bct}) = \sum_{k \geq -m} \delta_{0k} D_t^k + \sum_{k \geq -m} \delta_{1k} D_t^k \times R_c + \theta_{bc} + \gamma_{bt} + \epsilon_{bct}, \tag{3}$$

where PD_{bct} denotes the average probability of default of loans of bank b in country c at time t, D_t^k denotes dummy variables that take the value 1 if the geopolitical risk shock occurred k quarters following the event and 0 otherwise, R_c denotes dummy variables that take the value 1 if the borrower country is Russia and 0 otherwise, θ_{bc} denotes bank-country dummies, and γ_{bt} denotes bank-time dummies.[9] The coefficients δ_{1k} capture the differential effect of the two Russia-related geopolitical risk shocks on the average probability of default of loans to Russia compared to loans to other countries, in the k quarters following the shocks. For this analysis, we restrict the loan sample to all ongoing loans by U.S. banks that have foreign claims on Russia.

Figure 4 plots the coefficients δ_{1k} from Equation (3). It shows that the credit risk of the loans to Russian borrowers increased significantly more than that of loans to borrowers from all other countries in response to the two adverse geopolitical risk shocks. While credit risk did not significantly change across countries on average in the post-shock period, we observe a sharp increase in the average probability of default of outstanding loans to Russian borrowers in the quarter immediately following the shock, and this effect persists for several additional quarters. The magnitude of the increase three quarters after the shock is about two standard deviations of the average probability of default measure, or 20 basis points. This result further confirms that banks attribute greater credit risk to their exposures to borrowers from countries facing escalating geopolitical risk.

Aggregate bank-level evidence. Given the bank-country level and event study evidence, a key subsequent question is whether the increases in credit risk following adverse geopolitical risk shocks are substantial enough to materially affect banks' aggregate loan portfolios. To address this, we assess whether an increase in BGPR predicts a rise in the probability of

[9] We also ran the regression with R_c taking the value 1 if the borrower country is either Russia or Ukraine. The results remain largely unchanged, primarily because U.S. banks have limited exposure to Ukraine.

Figure 4: Geopolitical Risk and Credit Risk: Russia-Ukraine Conflicts



Note: The figure illustrates the effect of geopolitical risk shocks from the Crimea conflict in 2013:Q4 and the Russia-Ukraine war in 2022:Q1 on the log average probability of default of loans to Russian borrowers relative to loans to borrowers in other countries. It plots the coefficients δ_{1k} from Equation (3). Standard errors, shown in parentheses, are clustered at the country-time level. Data source(s): FR Y-14.

default of a bank's aggregate C&I loan portfolio. Specifically, we compute the weighted-average probability of default for each bank b's entire C&I loan portfolio in quarter t. We then regress the measure (in log) on the BGPR indices, controlling for bank characteristics, bank fixed effects, and time fixed effects:

$$ln(PD_{bt}) = \beta BGPR_{bt} + \gamma X_{bt} + \alpha_b + \alpha_t + \epsilon_{bt}, \tag{4}$$

where $BGPR_{bt}$ denotes $BGPR^N_{bt}$ or $BGPR^T_{bt}$, and X_{bt} denotes bank-level control variables including a bank's lagged Tier 1 capital ratio and liquid-asset ratio.

Columns (3)–(4) of Table 1 report the results. An increase in BGPR, as measured by either $BGPR^N$ or $BGPR^T$, significantly increases the aggregate probability of default of bank loans. A one-standard-deviation increase in BGPR raises the probability of default of a bank's C&I loan portfolio by 12 to 20 percent.

Taken together, the evidence at the bank-country level, from specific events, and at the bank level robustly shows that banks assign a higher probability of default to their exposures to borrowers from countries experiencing increasing geopolitical risk, and that the increase in credit risk is substantial enough to materially affect banks' aggregate loan portfolios.

3.2 Geopolitical Risk and Banks' Foreign Operations

How do banks respond to the increased riskiness of their loan portfolios as a result of rising geopolitical risk? Do they de-risk? We proceed to investigate how banks adjust their foreign exposures in response to increasing geopolitical risk in the countries where they operate, using the FFEIC 009 data for the sample period 1986:Q1 to 2022:Q4.

Specifically, we run the following regression:

$$\ln(exp_{bct}) = \beta_1 CGPR_{ct} + \beta_2 CGPR_{ct-1} + \beta_2 X_{ct} + \beta_3 X_{ct-1} + \alpha_{bt} + \alpha_{bc} + \epsilon_{bct}, \qquad (5)$$

where exp_{bct} represents a measure of bank b's exposure to country c in quarter t, and $CGPR_{ct}$ stands for $CGPR^N$ or $CGPR^T$. We include both the contemporaneous and one-quarter lagged values of $CGPR$.[10] X_{ct} captures country-level macro control variables, including the log of the exchange rate of country c's currency vis-à-vis the U.S. dollar, the log of country c's main stock price index, and an indicator variable equal to 1 if the country faces any sanctions from the United States. We also control for bank-time fixed effects (α_{bt}) to account for changes in banks' foreign exposures common to all countries, and bank-country fixed effects (α_{bc}) to account for level differences in exposures of banks across countries. Standard errors are clustered by country and time.

Table 2 reports the results with $CGPR^N$ as the main regressor. Columns (1)–(2) present results from regressions with banks' log total foreign exposures as the dependent variable. Columns (3)–(4) and (5)–(6) are based on log cross-border and local exposures as the dependent variables, respectively. As described in Section 2, banks can extend credit to foreign borrowers through two modes of operation: from an office outside the borrower's country of residence, resulting in cross-border claims, or from an office located in the borrower's country, resulting in local claims. The odd-numbered columns show the baseline results, and the even-numbered columns add country-level macro controls.

The results show that while banks reduce their total exposure to countries experiencing increasing geopolitical risk, their reallocation behavior varies significantly depending on their mode of operation in the affected country. While banks reduce cross-border exposures to

[10] Coefficients for additional lags of $CGPR$ are not statistically significant.

countries facing escalating geopolitical risk, their operations through local offices in those countries remain largely unchanged.[11] A one-standard-deviation increase in $CGPR^N$ reduces cross-border exposure by 6 percent (Column 4). In contrast, the corresponding coefficients for local claims are small and not statistically significant (Column 6).[12] The results are quantitatively and qualitatively similar with $CGPR^T$ as the main regressor, as shown in Appendix Table A.2.

Additional evidence. To further examine this lending pattern, we track the evolution of cross-border and local claims on Russia following three major geopolitical events: the conflict with Georgia in 2008:Q3, the annexation of Crimea in 2013:Q4, and the invasion of Ukraine in 2022:Q1. Panel (a) of Figure 5 presents the claims by the U.S. banking sector on Russia, and Panel (b) presents those for all BIS-reporting banking sectors. Notably, while both local and cross-border claims on Russia declined after these geopolitical shocks, local exposures fell significantly less, in percentage terms, than cross-border exposures.

This distinction between cross-border retrenchment and the persistence of local operations is further evident in banks' responses to Russia's 2022 invasion of Ukraine. At the time of the invasion in February 2022, several large global banks were running significant operations in Russia, including operations through local subsidiaries. UniCredit, Societe Generale, Citigroup, and RBI were among those with the largest exposures. Yet despite the geopolitical turmoil, most continued operating their local affiliates.[13]

[11]The effect becomes even stronger when earlier years are excluded from the sample. After 1999, the negative impact of geopolitical risk on cross-border claims is both larger in magnitude and more statistically significant, driven primarily by stronger effects on claims in emerging markets.

[12]Appendix Table A.1 further separates local claims exposures into those denominated in local currency and those in foreign currency (primarily U.S. dollars) to examine whether they respond differently to geopolitical risk. When geopolitical risk rises, the local currency typically depreciates, reducing the U.S. dollar value of local currency-denominated claims without necessarily affecting banks' local operations. The results align with this expectation: local claims in foreign currency show no significant response to geopolitical risk, while there is some evidence that local currency-denominated claims decline, likely due to exchange rate effects. We also examined how the mode of banks' local operations in foreign countries (branch vs. subsidiary) influences their response to rising geopolitical risk. Our findings suggest that banks with a higher share of assets in subsidiaries relative to branches reduce local claims less but cut cross-border claims more. However, the effect is not large, indicating that the branch-subsidiary distinction is not a key factor in shaping banks' responses to geopolitical risk.

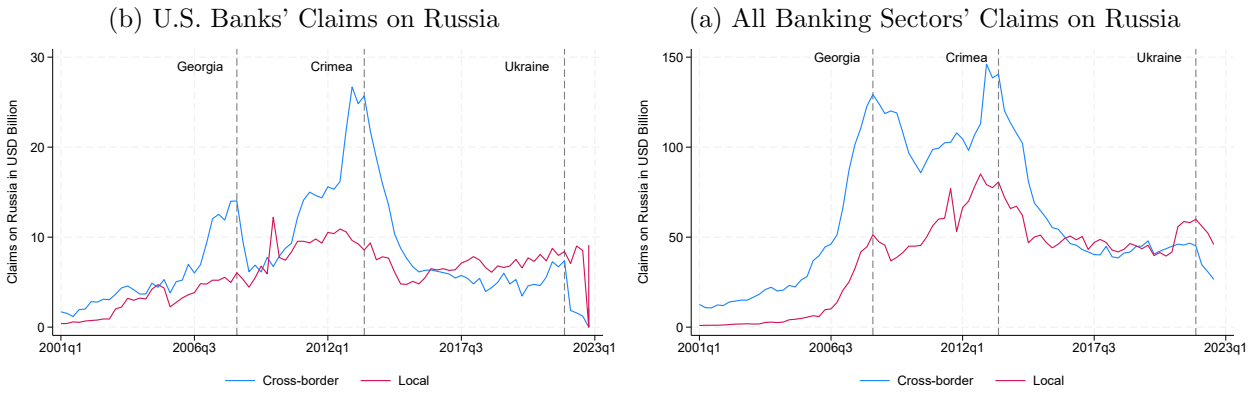
[13]An exception is Societe Generale, which was the only major global bank to fully exit Russia soon after the invasion. Before the war, the bank derived approximately 3 percent of its net income from Russian operations. In April 2022, it sold its Russian subsidiary, Rosbank, to a business group linked to a Russian oligarch, incurring a $3.3 billion dollar loss. By acting quickly, Societe Generale completed the sale before

Table 2: Response of Banks' Foreign Operations to Geopolitical Risk

	Total		Cross-border		Local	
$ln(exp_{bct})$	(1)	(2)	(3)	(4)	(5)	(6)
$CGPR^N_{ct}$	-0.018**	-0.022***	-0.026***	-0.031***	0.011	0.010
	(0.007)	(0.008)	(0.008)	(0.008)	(0.015)	(0.015)
$CGPR^N_{ct-1}$	-0.010	-0.010	-0.014	-0.013	0.012	0.009
	(0.008)	(0.008)	(0.009)	(0.009)	(0.014)	(0.014)
$\mathbf{1}(Sanction)_t$		0.007		-0.020		-0.009
		(0.017)		(0.018)		(0.027)
$ln(Exch.Rate)_t$		-0.002		0.004		-0.187*
		(0.025)		(0.025)		(0.109)
$ln(StockIndex)_t$		-0.125***		-0.117**		-0.113
		(0.046)		(0.046)		(0.088)
$ln(Exch.Rate)_{t-1}$		-0.064**		-0.068**		0.129
		(0.032)		(0.032)		(0.106)
$ln(StockIndex)_{t-1}$		0.152***		0.146***		0.213**
		(0.049)		(0.049)		(0.086)
Bank-country	Yes	Yes	Yes	Yes	Yes	Yes
Bank-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	137312	108303	135803	106891	34801	31039
R^2	0.894	0.906	0.875	0.887	0.878	0.885

Note: This table reports results from regressions at the bank-country-time level based on Equation (5) using the FFEIC 009 data for the sample period 1986:Q1 to 2022:Q4. $CGPR^N$ denotes the (recent) country-specific geopolitical risk index from Caldara and Iacoviello (2022). The dependent variable is the log total foreign claims in Columns (1)–(2), log cross-border claims in Columns (3)–(4), and log local claims in Columns (5)–(6). Columns (1), (3), and (5) show the baseline results for each dependent variable. Columns (2), (4), and (6) add country-level macro controls, including a country's log exchange rate vis-à-vis the U.S. dollar, log domestic stock price index, and an indicator variable equal to 1 if the country faces any sanctions from the United States. All regressions include bank-country and bank-time fixed effects. $CGPR^N$ is standardized by its respective standard deviation within the sample. Standard errors, shown in parentheses, are clustered at the country and time level. *$p < .1$; **$p < .05$; ***$p < .01$.

Figure 5: Banks' Cross-border and Local Exposures to Russia



Note: The figure illustrates cross-border claims (blue) and local claims (red) on Russia by the U.S. banking sector in Panel (a) and all BIS-reporting banking sectors in Panel (b). The vertical lines denote three geopolitical events: Russia's conflict with Georgia in 2008:Q3, Russia's annexation of Crimea in 2013:Q4, and Russia's invasion of Ukraine in 2022:Q1. Data source(s): BIS Consolidated Banking Statistics and FFIEC 009.

While UniCredit, Citigroup, and RBI have reduced their cross-border operations, they still own their Russian subsidiaries, consistent with the empirical evidence presented earlier. Citigroup has opted for a gradual wind-down, allowing business to run off while selling individual portfolios. UniCredit and RBI, howewer, continue to operate their Russian subsidiaries, even as regulatory and political pressures mount.[14] Most recently, in response to an ECB directive requiring banks still operating in Russia to present a plan for reducing their exposures, UniCredit took legal action while RBI halted brokerage account openings at its Russian subsidiary.[15]

In sum, our regression results indicate that while banks primarily reduce cross-border

the oligarch in question was sanctioned by the EU.

[14]For more information about the operations of global banks, including Citigroup, RBI, and UniCredit, in Russia since its invasion of Ukraine, see articles such as "Why are Raiffeisen and Unicredit still in Russia," Oct 4, 2022, Euromoney; "Western banks struggle to exit Russia after Putin intervention," Jan 16, 2023, Financial Times; and "Citigroup expects $190 mln of costs tied to Russia wind-down," February 27, 2023, Reuters. For a summary article on global banks' operations in Russia since the outbreak of the Russia-Ukraine War, see "European banks still in Russia: should they stay or should they go?" March 17, 2023, The Banker. Related information can be also found in a JP Morgan report titled "Global Banks, Russian Risk Assessment" from January 22, 2022, and in banks' quarterly earnings presentations and annual filings, see, e.g., Citigroup's 2022 10-K filing with the U.S. Securities and Exchange Commission.

[15]We will discuss more about factors contributing to the persistence of local operations under geopolitical risk in the subsequent subsection and section. One point to note is that while these global banks are reportedly still looking for opportunities to sell their Russian subsidiaries, any sale now requires approval from the Russian President and is likely to come at a hefty cost, further complicating their potential exit strategies.

exposures to countries facing heightened geopolitical risk, they largely maintain existing loans within their local operations despite the rising credit risk. This persistence aligns with patterns observed in the raw data and anecdotal evidence on banks' responses to Russia's 2022 invasion of Ukraine.

3.3 Geopolitical Risk and Other Risks

Do banks adjust their foreign operations similarly to other risks? Or is geopolitical risk distinct? We explore these questions by examining how banks adjust their cross-border and local exposures in response to other types of risks. We run Equation (5) using broad country-specific risk indices (instead of $CGPR$) as the main regressor, replacing $CGPR$ with CRI by Hassan et al. (2023), WUI by Ahir et al. (2022), and sovereign CDS spreads.

Table 3 reports the regression results. Columns (1)–(2), (3)–(4), and (5)–(6) correspond to specifications using CRI, WUI, and CDS spreads as the key regressors, respectively. Odd-numbered columns use log cross-border claims as the dependent variable, while even-numbered columns use log local claims. The results for CRI suggest a positive relationship with cross-border and local claims, though the effect of country risk on cross-border claims is not statistically significant. For WUI, the coefficients on both cross-border and local claims are small and statistically insignificant, suggesting that foreign exposures exhibit little sensitivity to broad country-level uncertainty. The results for CDS spreads show a negative relationship with cross-border and local claims, though only the effect on local claims is marginally significant, while the effect on cross-border claims remains insignificant.[16]

Overall, the results suggest that country risk, uncertainty, and sovereign credit risk do not have strong or consistent effects on banks' cross-border and local exposures, in contrast to the clear and asymmetric response observed with geopolitical risk. While banks reduce cross-border exposures but maintain local exposures in response to geopolitical risk, their adjustments to other types of risk do not follow this pattern. Instead, the effects of country risk, uncertainty, and sovereign credit risk on cross-border and local claims appear weaker and less systematic, with no clear distinction between how banks adjust these two types of exposures.

[16]Results remain consistent when alternative risk variables are included in log form.

Discussion. These findings indicate that banks respond to geopolitical risk differently than to other financial and economic risks, reinforcing the idea that geopolitical risk is a distinct category of risk.

One possible reason for this distinction is that geopolitical risk often entails expropriation risk. Throughout history, geopolitical conflicts have led to the seizure of foreign bank assets, making expropriation a uniquely catastrophic feature of geopolitical risk. Notable examples include the 1917 Russian Bolshevik Revolution, where the new government nationalized the financial system, expropriating all foreign-owned banks, including British, French, and American institutions, without compensation. In 1956, following the Suez Crisis, Egypt expropriated British and French banks in retaliation for military intervention. In 1960, after the Cuban Revolution, the government nationalized all U.S. banks, seizing the assets of Citibank, Chase Manhattan, and First National City Bank. In 2008-2010, Venezuela, under Hugo Chávez, expropriated Banco de Venezuela, previously owned by Spain's Santander, as part of broader anti-Western policies targeting foreign financial institutions. In 2012, Argentina expropriated the Spanish-controlled oil company YPF, seizing financial assets linked to Spanish banks in a move that escalated diplomatic tensions with the EU. More recently, Russia's response to Western sanctions in 2023-2024 has included the state takeover of assets from European banks such as UniCredit and Deutsche Bank, further illustrating the heightened expropriation risk foreign banks face in geopolitical conflicts.

Given that expropriation risk is often accompanied by disruptions in the rule of law and extreme regulatory or policy uncertainty, geopolitical risk becomes significantly more difficult for banks to predict, hedge, or mitigate. This distinguishes geopolitical risk from conventional financial and economic risks, which can be more readily managed through standard risk-assessment tools.

While expropriation risk may be a distinctively catastrophic feature of geopolitical risk, an open question remains: Does expropriation risk help explain the asymmetric effect of geopolitical risk on banks' adjustments to cross-border and local exposures, even as credit risk increases, as documented in Sections 3.1 and 3.2? In the next section, we formalize the role of expropriation risk within a framework of global banking and analyze its role in influencing banks' foreign exposure adjustment under geopolitical risk.

Table 3: Other Risks and Banks' Foreign Operations

	(1)	(2)	(3)	(4)	(5)	(6)
$ln(exp_{bct})$	Cross-border	Local	Cross-border	Local	Cross-border	Local
CRI_{ct}	-0.004	0.021				
	(0.017)	(0.017)				
CRI_{ct-1}	0.008	0.036**				
	(0.016)	(0.018)				
WUI_{ct}			0.004	0.003		
			(0.005)	(0.007)		
WUI_{ct-1}			-0.007	0.004		
			(0.005)	(0.007)		
CDS_{ct}					-0.013	-0.028*
					(0.009)	(0.016)
CDS_{ct-1}					-0.004	-0.022
					(0.012)	(0.014)
Bank-country FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	53655	18940	127821	33810	60464	19961
R^2	0.917	0.904	0.876	0.877	0.914	0.902

Note: This table reports results from regressions at the bank-country-time level based on Equation (5) with alternative country-specific risk indices as the main regressor (instead of $CGPR$). The alternative indices include CRI by Hassan et al. (2023) (Columns (1)–(2)), WUI by Ahir et al. (2022) (Columns (3)–(4), and sovereign CDS spreads (Columns (5)–(6)). The dependent variable the log cross-border claims in Columns (1), (3), and (5), and log local claims in Columns (2), (4), and (6). All regressions include bank-country and country-time fixed effects. All the risk indices are standardized by their respective standard deviations within the sample. Standard errors, shown in parentheses, are clustered at the country and time level. *$p < .1$; **$p < .05$; ***$p < .01$.

4 A Model of Global Banking under Geopolitical Risk

In this section, we present a stylized model to rationalize the empirical facts established in the previous section and generate testable qualitative predictions on the transmission of geopolitical risk to domestic credit through global banks for the subsequent analysis. The model examines banks' choices to operate abroad via cross-border lending or local affiliates, as well as their domestic operations, and analyzes how credit allocation across these channels responds to heightened foreign geopolitical risk.

4.1 Setup

The framework consists of three periods and a global bank that makes investment decisions. At $t = 0$, the bank decides how much to invest abroad and at home. It can invest a fixed amount L^* abroad for two periods and a variable amount L domestically for one period, with the option to reinvest in domestic assets at $t = 1$.

The return on the foreign two-period investment is uncertain. At $t = 0$, the probability of success is high (p^G) with probability $(1 - \phi)$ and low (p^B) with probability ϕ. These good (G) and bad (B) states correspond to states of low and high geopolitical risk, respectively. At $t = 1$, the bank learns whether geopolitical risk is high or low, which determines the probability of success of its foreign investment: if geopolitical risk is high, the probability of success is low and $p = p^B$; if geopolitical risk is low, the probability of success is high and $p = p^G$. At $t = 2$, geopolitical risk either materializes or does not. If geopolitical risk does not materialize, the foreign investment succeeds and pays R^*. If geopolitical risk materializes, it leads to expropriation by the foreign government: the government seizes the investment, resulting in a zero payoff. For simplicity, we do not model domestic geopolitical risk. Domestic investment is assumed to be risk-free, yielding a guaranteed return of R at both $t = 1$ and $t = 2$.

The bank has an initial equity endowment E_1 at $t = 0$ and is subject to a leverage constraint that closely follows the formulation of minimum regulatory capital ratios under Basel III. Specifically, the bank's equity-to-risk-weighted assets ratio must remain above a

constant threshold μ:

$$\frac{E_1}{L_1 + L^* \alpha(\phi, B, p^G, p^B)} \geq \mu, \tag{6}$$

where $\alpha(\phi, p^G, p^B) > 1$ is the risk weight on the foreign investment L^*, which decreases with ϕ, p^G, and p^B.

The effect of heightened geopolitical risk abroad on capital constraints in the model maps actual regulatory practice. As shown in Section 3.1, geopolitical risk increases the probability of default on loans extended to borrowers in affected countries. Since default probability directly influences the risk weight assigned to loans, rising geopolitical risk results in higher capital requirements for foreign exposures.[17] By contrast, the risk weight on the domestic, risk-free investment is set to 1.

We assume $L^* < \frac{E_1}{\alpha\mu}$ ensuring that the fixed foreign investment L^* does not exceed the bank's total lending capacity given the risk weights on foreign assets and allowing room for domestic investment. Additionally, we assume that foreign investment is preferable to investing solely in the domestic asset, which holds if $(1-\phi)p^G R^*$ is sufficiently high.

Because L^* and E_1 are fixed, the equity constraint pins down L_1:

$$L_1 = \frac{E_1 - \mu L^* \alpha(\phi, p^G, p^B)}{\mu}.$$

To finance its investments, the bank borrows $D_1 = L_1 + L^* - E_1$ from depositors at an exogenous interest rate $i < R$.[18] The funding is for one period but can be rolled over at $t = 1$ at the same rate. At $t = 1$, the bank learns the probability of success of its foreign investment and may choose to liquidate early, recovering δL^*, where $\delta < 1$. This option allows the bank to withdraw from foreign operations in response to rising geopolitical risk, albeit at a cost. While early liquidation results in a direct loss, it eliminates risk exposure and reduces risk-weighted assets, thereby enhancing the bank's lending capacity.

[17] Note that this increase in risk-weighted assets applies to both modes of foreign exposure: cross-border lending and exposures held through foreign affiliates, because material foreign branches and subsidiaries are consolidated with the parent bank's balance sheet for capital regulation purposes. For U.S. banks, an increase in risk-weighted assets may also result in higher projected losses under regulatory stress tests, further increasing the parent bank's capital requirements.

[18] While we refer to the bank's external liabilities as "deposits," these can represent any form of debt, including wholesale funding, that the bank raises through its foreign branches and subsidiaries.

Two modes of foreign operations. The bank can choose between two modes of foreign operation: cross-border investment (X), where it lends directly from its home country, or local investment (A), where it lends through a locally established affiliate in the foreign country. Note that establishing a local affiliate incurs a non-pecuniary fixed cost $\kappa > 0$.[19] When conducting cross-border operations, the bank raises funding domestically. In contrast, when operating from a local affiliate, it raises funding D_t^* in the foreign market, where $D_t^* < D_t$, while borrowing the remainder $D_t - D_t^*$ at home.[20] We assume that the foreign and domestic interest rates on deposits are the same.

The key distinction between the two modes—aside from the fixed cost κ—is that foreign deposits, unlike domestic deposits, are not repaid if geopolitical risk materializes at $t = 2$. The rationale is that when geopolitical conflict leads to expropriation, the foreign government seizes the bank's local affiliate, and the bank is no longer obligated to repay foreign depositors. As a result, the expected profits from operating a local affiliate at $t = 1$ exceed those from cross-border investment by $(1 - p)D_2^* i$.

We focus on expropriation risk when modeling global banking under geopolitical risk, as history has repeatedly shown that geopolitical conflicts can lead to heightened expropriation risk and the government seizure of foreign bank assets, as detailed in Section 3.3. As such, expropriation risk is a uniquely catastrophic feature of geopolitical risk, distinguishing it from other financial and economic risks. That said, alternative modeling approaches are conceivable. One could assume, for instance, that interest rates abroad are lower, incentivizing banks to establish an affiliate to raise funding in the foreign market at a fixed cost. Another plausible assumption is that liquidation costs are higher for investments made through affiliates than for cross-border investments. Many of the predictions that follow would still hold under these alternative formulations.[21] In practice, these additional factors may reinforce expropriation risk, further shaping how banks adjust their foreign and domestic operations in response to geopolitical risk.

[19] This fixed cost is consistent with the literature, such as Niepmann (2023), and helps explain why banks may prefer cross-border operations over establishing a foreign affiliate.

[20] D_t^* is assumed to be exogenous to keep the model simple. Alternatively, foreign funding could be modeled as proportionate to the amount of foreign lending.

[21] Proposition 1(b) would no longer hold, as the difference in profits between affiliate and cross-border lending would no longer increase with p.

4.2 Foreign Operations under Geopolitical Risk

Having established the key differences between the two modes of foreign operation, we now solve the model to analyze how the bank adjusts its cross-border and affiliate investments in response to heightened geopolitical risk, explaining the empirical findings presented in the previous section.

Under liquidation, profits realized at $t = 2$ are the same across both modes. This follows because δ is identical in both cases, and investments in the domestic asset at $t = 0$ and $t = 1$ are the same. Specifically, $\pi_2^{X,L} = \pi_2^{A,L} = RL_2^L - iD_2^L$, where L_2^L denotes the investment in the domestic asset at $t = 1$ under liquidation (L). Investment decisions remain unchanged because they are governed by the leverage constraint, which is independent of D_t (and D_t^*).

When the foreign investment continues (C), the bank's expected profits under cross-border investment are:

$$\pi_2^{X,C} = pR^*L^* + L_2^C R - D_2^C i. \tag{7}$$

The bank's expected profits when it continues operating through a local affiliate are:

$$\pi_2^{A,C} = pR^*L^* + L_2^C R - D_2^C i + (1-p)D_2^* i > \pi_2^{X,C}. \tag{8}$$

Note the superscript associated with p is suppressed because the formulas hold for both the good and bad states of the world.

Equations (7) and (8) highlight a key implication of the model: because local deposits raised by foreign affiliates do not have to be repaid if the foreign government expropriates the affiliate, the bank has a stronger incentive to liquidate cross-border investment than investment through a foreign affiliate amid heightened geopolitical risk.

PROPOSITION 1. *Let $\hat{\delta}$ denote the threshold value of δ at which the bank is indifferent between liquidating or continuing its foreign investment at $t = 1$.*

(a) Since $\pi_2^{A,C} > \pi_2^{X,C}$ and $\pi_2^{X,L} = \pi_2^{A,L}$, it follows that $\hat{\delta}^A > \hat{\delta}^X$. In other words, the threshold δ required for liquidation is higher when the bank operates through a foreign affiliate than when it invests cross-border.

(b) The difference in liquidation thresholds, $\Delta\hat{\delta} = \hat{\delta}^A - \hat{\delta}^X$, increases as p decreases. That is, the lower the probability of success p, the larger is the difference between the two

liquidation thresholds.

(c) The difference in liquidation thresholds, $\Delta\hat{\delta} = \hat{\delta}^A - \hat{\delta}^X$, increases as D_2^* increases. That is, the more funding the bank raises in the foreign market, the larger is the difference between the two liquidation thresholds.

Proof. See Appendix C. □

Proposition 1 shows that, for the same liquidation cost δ, banks are less likely to liquidate investments in a foreign affiliate than in cross-border operations. Moreover, as geopolitical risk increases (reflected in a lower p), the divergence between liquidation decisions for cross-border and affiliate investments becomes more pronounced. The model thus explains the empirical finding from Section 3.2 that banks reduce exposures primarily through cross-border lending, while maintaining affiliate-based lending when geopolitical risk rises.[22]

Furthermore, Proposition 1(b) helps explain the empirical finding from Section 3.3 that geopolitical risk is distinct from other types of risk, as expropriation risk plays a starker, more catastrophic role in shaping how banks adjust their cross-border and local operations. For example, when sovereign or economic risk rises in a country, banks may incur losses, but their operations typically continue, and they remain obligated to honor foreign liabilities. As a result, banks' responses to sovereign and economic risk tend to be more similar across cross-border and local operations than their responses to geopolitical risk.

Empirical validation. We further validate the model by empirically testing Proposition 1(c), which predicts that the more funding a bank raises in the foreign market, the less it divests from local investments in that market in response to geopolitical risk. To test this, we gather data on local liabilities from FFIEC 009 and augment Equation (5) with interaction terms between $CGPR$ and banks' lagged local liability position, measured as four-quarter moving averages (in log). The coefficient on this interaction term estimates the extent to which a larger local funding position influences the sensitivity of foreign exposure to geopolitical risk.

[22] As discussed, while it is plausible that liquidating local affiliate operations is more costly than liquidating cross-border activities, the model generates a higher likelihood of cross-border activities being liquidated even without this assumption.

Panel (a) of Table 4 presents the results. Columns (1)–(2) present results from regressions with banks' log total foreign exposures as the dependent variable, and Columns (3)–(4) and (5)–(6) are based on log local and cross-border exposures as the dependent variables, respectively, with the even-numbered columns including macro control variables. With total foreign exposures as the dependent variable, our coefficients of interest on the interaction terms are positive and significant, indicating that banks with larger local funding positions are less likely to reduce their overall foreign exposures in response to heightened geopolitical risk. This effect is primarily driven by local exposures, as shown in Columns (3)–(4), where the coefficients on the interaction terms remain positive and statistically significant. In contrast, the coefficients in Columns (5)–(6), where cross-border exposures are the dependent variable, are not statistically different from zero, suggesting that the mitigating effect of local funding applies specifically to local investments rather than cross-border positions. All of these findings support the model's prediction.

Panel (b) of Table 4 further examines whether local funding positions influence banks' foreign lending responses to other types of risk, as measured by CRI, WUI, and sovereign CDS spreads. The results show that, unlike in the case of geopolitical risk, local funding positions do not significantly affect how banks adjust their foreign exposures when faced with these alternative risks. This finding reinforces the model's prediction that geopolitical risk, particularly due to expropriation concerns, uniquely alters banks' foreign lending behavior. It also highlights that the ability to default on foreign liabilities plays a central role in banks' responses to geopolitical risk but is less relevant when responding to other macroeconomic or financial risks.[23]

4.3 Spillovers of Geopolitical Risk to Domestic Operations

Next, we use the model to analyze the implications of rising geopolitical risk abroad for domestic lending. The bank's equity position and the riskiness of its investments determine its domestic lending at $t = 1$. When the bank liquidates its foreign investment, its equity

[23]We also test the robustness of the results in Table 4 using an alternative measure of local liabilities: for each bank, we calculate its local liabilities from each foreign country as a share of its total lending to that country. Appendix Tables A.3 and A.4 present the results for geopolitical risk and other risks, respectively, which are qualitatively similar to those in Table 4.

Table 4: Banks' Foreign Response to Risk by Ex-Ante Local Liabilities

(a) Geopolitical Risk

	Total Exp.		Local		Cross-border	
$ln(exp_{bct})$	(1)	(2)	(3)	(4)	(5)	(6)
$CGPR^N_{ct}$	-0.049***	-0.050***	-0.067***	-0.066***	-0.074***	-0.071***
	(0.019)	(0.017)	(0.022)	(0.022)	(0.015)	(0.013)
$CGPR^N_{ct} \times ln(LL)_{bct-1}$	0.004**	0.004**	0.008**	0.008**	0.002	0.002
	(0.002)	(0.002)	(0.004)	(0.004)	(0.002)	(0.002)
$CGPR^N_{ct-1}$	-0.018	-0.019	-0.034	-0.034	-0.027*	-0.023
	(0.016)	(0.015)	(0.026)	(0.026)	(0.015)	(0.015)
$CGPR^N_{ct-1} \times ln(LL)_{bct-2}$	0.002	0.002	0.005	0.005	-0.001	-0.001
	(0.002)	(0.002)	(0.005)	(0.005)	(0.002)	(0.002)
Macro Controls	No	Yes	No	Yes	No	Yes
Bank-country FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	16829	16107	15870	15208	16040	15374
R^2	0.956	0.958	0.919	0.922	0.938	0.938

(b) Other Risks

	CRI		WUI		CDS	
	(1)	(2)	(3)	(4)	(5)	(6)
$ln(exp_{bct})$	Local	Cross-border	Local	Cross-border	Local	Cross-border
CRI_t	-0.025	-0.019				
	(0.033)	(0.035)				
$CRI_t \times ln(LL)_{bct-1}$	0.002	-0.003				
	(0.004)	(0.004)				
CRI_{t-1}	-0.010	-0.059*				
	(0.032)	(0.033)				
$CRI_{t-1} \times ln(LL)_{bct-2}$	0.004	0.005				
	(0.004)	(0.004)				
WUI_t			-0.004	0.030**		
			(0.015)	(0.012)		
$WUI_t \times ln(LL)_{bct-1}$			-0.000	-0.006***		
			(0.002)	(0.002)		
WUI_{t-1}			0.021	0.002		
			(0.015)	(0.013)		
$WUI_{t-1} \times ln(LL)_{bct-2}$			-0.002	-0.003		
			(0.002)	(0.002)		
$ln(CDS)_t$					0.004	-0.067
					(0.086)	(0.096)
$ln(CDS)_t \times ln(LL)_{bct-1}$					-0.004	0.007
					(0.012)	(0.007)
$ln(CDS)_{t-1}$					-0.167*	0.083
					(0.087)	(0.086)
$ln(CDS)_{t-1} \times ln(LL)_{bct-2}$					0.008	0.008
					(0.012)	(0.007)
Macro Controls	Yes	Yes	Yes	Yes	Yes	Yes
Bank-country FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12631	12521	14490	14347	13982	13803
R^2	0.943	0.922	0.940	0.922	0.941	0.922

Note: This table reports results from regressions at the bank-country-time level based on an augmented version of Equation (5), using the FFEIC 009 data for the sample period 1986:Q1 to 2022:Q4. Panel (a) uses $CGPR^N$, the (recent) country-specific geopolitical risk index from Caldara and Iacoviello (2022), along with $ln(LL)_{bct-1}$, the log of local liabilities received by bank b from country c, calculated as a four-quarter moving average from $t-4$ to $t-1$, and their interactions as the main regressors. The dependent variable is the log total foreign claims in Columns (1)–(2), log local claims in Columns (3)–(4), and log cross-border claims in Columns (5)–(6). Columns (1), (3), and (5) show the baseline results for each dependent variable. Columns (2), (4), and (6) add country-level macro controls, including a country's log exchange rate vis-à-vis the U.S. dollar, log domestic stock price index, and an indicator variable equal to 1 if the country faces any sanctions from the United States. Panel (b) replaces $CGPR^N$ with alternative country-specific risk indices, $ln(LL)_{bct-1}$, and their interactions as the main regressors. The alternative indices include CRI by Hassan et al. (2023) (Columns (1)–(2)), WUI by Ahir et al. (2022) (Columns (3)–(4), and log sovereign CDS spreads (Columns (5)–(6)). The dependent variable is log local claims in Columns (1), (3), and (5), and log cross-border claims in Columns (2), (4), and (6). All regressions include bank-country and country-time fixed effects. All risk indices are standardized by their respective standard deviation within the sample. Standard errors, shown in parentheses, are clustered at the country and time level. *$p < .1$; **$p < .05$; ***$p < .01$.

is given by $E_2^L = \delta L^* + R_1 L_1 - D_1 i$, where $R_1 L_1 - D_1 i$ captures earnings from domestic investment at $t = 1$. If the bank does not liquidate, its equity is $E_2^C = L^* + R_1 L_1 - D_1 i$, which satisfies $E_2^C > E_2^L$, indicating that liquidation results in a lower equity position. Although liquidation reduces the bank's equity, it also frees up leverage capacity, as the risk weight on domestic investment is 1, whereas the risk weight on the riskier foreign investment is higher. Consequently, domestic lending following liquidation is given by:

$$L_2^L = \frac{\delta L^* + L_1 R_1 - D_1 i}{\mu}.$$

If geopolitical risk turns out to be high at $t = 1$ and the bank does not liquidate, the bank's borrowing capacity shrinks relative to the good state of the world due to an increase in foreign risk-weighted assets $L^* \alpha(p)$:

$$L_2^C = \frac{L^* + R_1 L_1 - D_1 i - \mu L^* \alpha(p)}{\mu}.$$

The effects of geopolitical risk on domestic lending are summarized in the following proposition:

PROPOSITION 2. *(a) $L_2^{G,C} > L_2^{B,C}$. Domestic lending under continuation is higher in the good state of the world with low geopolitical risk than in the bad state with high geopolitical risk.*

(b) $L_2^L > L_2^{B,C}$ if $\delta > 1 - \alpha(p)\mu$. Domestic lending is higher when the bank liquidates its foreign investment at $t = 1$ than when it continues its foreign operation, provided that the reduction in borrowing capacity from higher foreign risk-weighted assets due to geopolitical risk exceeds the combined effect of the equity loss and the decrease in risk-weighted assets under liquidation.

(c) $L_1 > L_2^{B,C}$ if $\frac{(R_1-1)L_1-(i-1)D_1}{\mu} < (\alpha(p^B) - \alpha(\phi, p^B, p^G))L^*$. $L_2^{G,C} > L_1$ always holds. In other words, domestic lending contracts at $t = 1$ in the bad state of the world relative to $t = 0$ if the positive effect of increased equity from domestic investment realized in $t = 1$ on leverage is sufficiently small relative to the increase in foreign risk-weighted assets. Domestic lending always expands in the good state of the world.

Proof. See Appendix C. □

Proposition 2 highlights that heightened geopolitical risk abroad reduces domestic lending when banks do not divest, creating spillover effects from foreign geopolitical risk to domes-

tic credit supply. The extent of these spillovers depends on the cost of liquidating foreign investments. If liquidation costs are low, banks can recover enough capital to mitigate the negative spillover effects, making liquidation preferable to continuation. However, if liquidation is costly, banks may choose to maintain their foreign positions, amplifying spillovers to domestic lending. Since banks with foreign affiliates are less likely to liquidate, spillover effects tend to be stronger for banks operating through affiliates rather than cross-border lending.

Furthermore, when geopolitical risk increases, domestic lending will decline relative to the previous period—unless banks generate sufficient domestic profits to counteract the negative spillover effects. Lower capital requirements can also help mitigate these spillovers. Banks typically hold capital buffers above the regulatory minimum, providing some flexibility to absorb shocks without immediately constraining lending. Instead of depending on regulatory intervention to ease capital requirements, banks may choose to draw down their excess buffers to sustain domestic lending in the face of heightened geopolitical risk.

Model predictions. Based on the theoretical framework, we derive the following testable hypotheses on the spillover of geopolitical risk to domestic lending through global banks:

1. Banks exposed to heightened geopolitical risk in their foreign operations reduce domestic lending more significantly.
2. The reduction in domestic lending is more pronounced when geopolitical risk rises in markets where banks operate through affiliates.
3. Spillover effects are larger for banks with lower capital ratios.

5 Transmission of Geopolitical Risk to Domestic Credit

Guided by the model predictions from the previous section, we test the spillover effects of geopolitical risk on domestic lending through global banks. Our main analysis examines how U.S. banks' exposure to foreign geopolitical risk, as measured by the BGPR indices, affects their loan origination to U.S. firms, using FR Y-14 data.

5.1 Geopolitical Risk and Domestic Loan Origination

Loan-level analysis. To test the prediction that banks exposed to heightened geopolitical risk in their foreign operations reduce domestic lending more (Prediction 1 from Section 4), we first estimate the following specification at the loan level using the FR Y-14 data for the period 2013:Q1 to 2022:Q4:

$$ln(orig_{bit}) = \beta BGPR_{bt} + \delta Z_{bt} + \delta X_{bit} + \gamma_{it} + \alpha_b + \epsilon_{bit}, \tag{9}$$

where $orig_{bit}$ denotes the amount of loan origination by bank b to domestic firm i at time t, $BGPR_{bt}$ denotes $BGPR^N_{bt}$ or $BGPR^T_{bt}$, Z_{bt} denotes bank-level controls including liquid asset ratio and Tier 1 capital ratio, X_{bit} denotes loan-level controls including maturity and interest rate, γ_{it} denotes firm-time fixed effects, and α_b denotes bank fixed effects. The regression sample is restricted to loans by U.S.-headquartered banks to U.S. firms.

Our coefficient of interest, β, measures the extent to which banks that experienced a greater increase in geopolitical risk through their foreign exposures, as captured by the BGPR indices, adjusted their loan origination to domestic firms, conditioning on the specified controls and fixed effects. As described in Section 2, the BGPR indices contain considerable variation, both across banks and over time, due to differences in the geographical origin and magnitude of their exposures, both of which fluctuate over time. Our estimation relies exclusively on cross-bank within-firm variation for identification, given the inclusion of firm-time fixed effects. This alleviates concerns about confounding factors from the demand side, such as changes in credit demand by firms in response to geopolitical risk.

Panel (a) of Table 5 reports the results. Columns (1)–(3) presents estimates using $BGPR^N$ as the main regressor, while Columns (4)–(6) use $BGPR^T$. Columns (1) and (4) include bank, time, and firm fixed effects separately, along with bank-level controls. Columns (2) and (5) include bank and firm-time fixed effects and incorporate both bank- and loan-level controls. Columns (3) and (6) further include alternative risk controls including bank-specific risk indices based on CRI, WUI, and sovereign CDS spread, which are constructed following Equation (1), where $CGPR$ is replaced with these alternative risk measures.

The results show that U.S. banks significantly reduce loan origination to domestic firms in response to an increase in BGPR, whether measured by $BGPR^N$ or $BGPR^T$. The coefficients on $BGPR$ remain stable or even increase when firm-time fixed effects are included in Columns (2) and (4), indicating that changes in credit demand are not a significant confounding factor. Similarly, the coefficients remain stable when alternative risk controls are included, indicating that the effect of geopolitical risk on loan origination is not confounded by broader measures of financial and economic risk. This finding is consistent with our illustrations and results from Sections 2 and 3.3, which highlight that geopolitical risk is distinct from other types of risk. The consistency of these estimates across the two measures and various model specifications further reinforces the robustness of the results, confirming that the impact of geopolitical risk on lending is not driven by firm-level credit demand shocks but rather by banks' adjustments in credit supply. Based on the estimates in Columns (3) and (6), which include the full set of fixed effects and controls, a one-standard-deviation increase in $BGPR$ reduces U.S. banks' loan origination to U.S. firms by 8-9 percent.

Bank-level analysis. In addition to the loan-level analysis, which allows us to control for potential demand-side responses by firms and isolate the supply effect, we also conduct a bank-level analysis to assess whether this effect is substantial enough to be observed at the aggregate level. Specifically, we apply the following specification:

$$log(orig_{bt}) = \beta_1 BGPR_{bt} + \beta_2 BGPR_{bt-1} + \delta Z_{bt-1} + \gamma_t + \alpha_b + \epsilon_{bit}, \tag{10}$$

where $orig_{bt}$ denotes the total amount of loan origination by bank b at time t, $BGPR_{bt}$ denotes $BGPR^N_{bt}$ or $BGPR^T_{bt}$, and the lagged BGPR indices are included to capture any persistent effects. Z_{bt} denotes bank-level controls including contemporaneous and lagged liquid asset ratio and Tier 1 capital ratio, γ_t denotes time fixed effects, and α_b denotes bank fixed effects. The coefficients of interest, β_1 and β_2, capture the total spillover effects of foreign geopolitical risk on U.S. banks' domestic loan origination on average.

Panel (b) of Table 5 reports the results. As in Panel (a), Columns (1)–(3) presents estimates using $BGPR^N$ as the main regressor, while Columns (4)–(6) use $BGPR^T$. Columns

Table 5: Geopolitical Risk and U.S. Domestic Loan Origination

(a) Loan Level

	$BGPR^N$			$BGPR^T$		
$ln(orig_{bit})$	(1)	(2)	(3)	(4)	(5)	(6)
$BGPR^N_{bt}$	-0.072***	-0.089***	-0.087***			
	(0.020)	(0.027)	(0.027)			
$BGPR^T_{bt}$				-0.049***	-0.079***	-0.081***
				(0.013)	(0.021)	(0.021)
Bank Controls	Yes	Yes	Yes	Yes	Yes	Yes
Loan Controls	No	Yes	Yes	No	Yes	Yes
Alt Risk Controls	No	No	Yes	No	No	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	No	No	Yes	No	No
Firm FE	Yes	No	No	Yes	No	No
Firm-time FE	No	Yes	Yes	No	Yes	Yes
N	307873	171380	171380	307873	171380	171380
R^2	0.593	0.615	0.615	0.593	0.615	0.615

(b) Bank Level

	$BGPR^N$			$BGPR^T$		
$ln(orig_{bt})$	(1)	(2)	(3)	(4)	(5)	(6)
$BGPR^N_{bt}$	-0.064	-0.078	-0.076			
	(0.060)	(0.059)	(0.056)			
$BGPR^N_{bt-1}$	-0.170**	-0.168**	-0.147**			
	(0.075)	(0.074)	(0.067)			
$BGPR^T_{bt}$				-0.046	-0.058	-0.053
				(0.070)	(0.071)	(0.067)
$BGPR^T_{bt-1}$				-0.168**	-0.149*	-0.138*
				(0.069)	(0.079)	(0.075)
Bank Controls	No	Yes	Yes	No	Yes	Yes
Alt Risk Controls	No	No	Yes	No	No	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
N	475	461	461	475	461	461
R^2	0.954	0.955	0.956	0.955	0.956	0.957

Note: This table reports results with log loan origination amount (*orig*) as the dependent variable, using FR Y-14 data from 2013:Q1 to 2022:Q4. Panel (a) reports results from loan-level regressions based on Equation (9). Panel (b) reports results from bank-level regressions based on Equation (10). $BGPR^N$ denotes the bank-specific geopolitical risk index, constructed from $CGPR^N$ or the (recent) country-specific geopolitical risk index from Caldara and Iacoviello (2022) according to Equation (1). $BGPR^T$ denotes the bank-specific geopolitical risk index derived from $CGPR^T$, which is based on earnings call transcripts processed through the NL Analytics platform, capturing geopolitical risk perception by firms worldwide. Bank controls include Tier 1 capital ratio, liquid asset ratio as well as their lagged versions in bank-level regressions. Loan controls include interest rate and maturity. Alternative risk controls include bank-specific risk indices based on country risk index (CRI) by Hassan et al. (2023) and World Uncertainty Index (WUI) by Ahir et al. (2022), and sovereign CDS spread. All the geopolitical risk indices are standardized by their respective standard deviations within the sample. Standard errors, shown in parentheses, are clustered at the bank and time level for loan-level regressions and at the bank level for bank-level regressions. $^*p < .1$; $^{**}p < .05$; $^{***}p < .01$.

(1) and (4) include bank and time fixed effects. Columns (2) and (5) incorporate bank-level controls, while Columns (3) and (6) further add alternative risk controls, including bank-specific risk indices based on the CRI, WUI, and sovereign CDS spreads.

The coefficients on both $BGPR^N$ and $BGPR^T$ are negative, significant, and of similar magnitude, indicating a strong relationship between foreign geopolitical risk and domestic credit supply at the bank-level. Based on the estimates in Columns (3) and (6), a one-standard-deviation increase in $BGPR$ reduces U.S. banks' loan origination to U.S. firms by 19-21 percent on average. This indicates that the spillover effects of foreign geopolitical risk on domestic credit markets through global banks effect are substantial enough to be observed at the aggregate level.

Taken together, the loan-level and bank-level results confirm Prediction 1 from the theoretical framework: banks exposed to heightened geopolitical risk in their foreign operations reduce domestic lending more. This finding underscores the spillover effects of foreign geopolitical shocks, demonstrating that banks do not simply adjust their foreign operations in response to geopolitical risk but also contract their domestic credit supply.

5.2 Role of Local vs. Cross-border Foreign Exposures

Next, we test Prediction 2 from the model, which states that the reduction in domestic lending is more pronounced when geopolitical risk rises in markets where banks operate through affiliates. To analyze this, we estimate Equations (9) and (10) using BGPR indices decomposed into two separate components to distinguish between exposure from local claims and cross-border claims:

$$BGPR_{bt}(\mathbf{1}(\text{Cross-border})) = \sum_c \mathbf{1}(\text{Cross-border})_{bct-1} \times \omega_{bct} CGPR_{ct}, \tag{11a}$$

$$BGPR_{bt}(\mathbf{1}(\text{Local})) = \sum_c \mathbf{1}(\text{Local})_{bct-1} \times \omega_{bct-1} CGPR_{ct}, \tag{11b}$$

where $\mathbf{1}(\text{Cross-border})_{bct}$ denotes a dummy variable equal to 1 if bank b has no local claims on country c at time t and 0 otherwise, and $\mathbf{1}(\text{Local})_{bct}$ is a dummy variable equal to 1 if

bank b has non-zero local claims on country c at time t and 0 otherwise. All other variables are defined consistently with Equation (1).

If the forces that incentivize banks with local claims to maintain affiliate operations play a significant role in driving the spillover effects, as predicted by the model, then the coefficients on $\mathbf{1}(\text{Local})_{bct}$ should be negative and significant, whereas those on $\mathbf{1}(\text{Cross-border})_{bct}$ should be insignificant.

Table 6 presents the results with $BGPR^N$ as the main regressor, with Panel (a) displaying the loan-level results and Panel (b) displaying the bank-level results. Column (1)–(2) include $\mathbf{1}(\text{Local})_{bct}$ as the regressor, without and with bank-level controls, respectively; Column (3)–(4) include $\mathbf{1}(\text{Cross-border})_{bct}$ as the regressor; and Column (5)–(6) include both as regressors. As shown in the first two columns, the coefficients on $\mathbf{1}(\text{Local})_{bct}$ are negative and significant, indicating that geopolitical risk, through banks' local exposure, plays a significant role in reducing domestic loan origination and driving the spillover effects. In contrast, the coefficients on $\mathbf{1}(\text{Cross-border})_{bct}$ are not statistically significant, suggesting that geopolitical risk transmits to domestic credit supply primarily through local affiliate exposure rather than cross-border operations. When both indices are included in the regression, the coefficient on $\mathbf{1}(\text{Local})_{bct}$ continues to be negative and significant, confirming the role of foreign exposure through local claims in driving the spillover effects. These results hold at both the loan and bank levels. Appendix Table A.5 presents the results with $BGPR^T$ as the main regressor, and all the results are quantitatively and qualitatively similar.

Overall, these results provide strong evidence that global banks with local affiliate exposure react more significantly to geopolitical shocks abroad, leading to a greater contraction in domestic lending. This finding aligns with the model's Prediction 2, confirming that spillover effects are stronger when geopolitical risk increases in markets where banks have local affiliates. In contrast, banks with predominantly cross-border operations adjust their foreign exposures more quickly and to a greater extent, allowing them to absorb geopolitical shocks with less impact on their domestic lending activity. The distinction between affiliate-based and cross-border exposure highlights the role of global banks' corporate structures in shaping their responses to geopolitical risk and influencing its transmission to the domestic economy.

Table 6: Geopolitical Risk Transmission: Cross-border vs. Local Exposure, $BGPR^N$

(a) Loan Level

$ln(orig_{bit})$	(1)	(2)	(3)	(4)	(5)	(6)
$BGPR^N_{bt}(\mathbf{1}(\text{Local}))$	-0.060**	-0.062**			-0.060**	-0.060**
	(0.026)	(0.026)			(0.027)	(0.027)
$BGPR^N_{bt}(\mathbf{1}(\text{Cross-border}))$			-0.021	-0.037	-0.010	-0.023
			(0.044)	(0.046)	(0.045)	(0.046)
Bank Controls	No	Yes	No	Yes	No	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	205642	199753	205642	199753	205642	199753
R^2	0.594	0.592	0.594	0.592	0.594	0.592

(b) Bank Level

$ln(orig_{bt})$	(1)	(2)	(3)	(4)	(5)	(6)
$BGPR^N_{bt}(\mathbf{1}(\text{Local}))$	-0.061	-0.075			-0.069	-0.082
	(0.061)	(0.060)			(0.061)	(0.060)
$BGPR^N_{bt-1}(\mathbf{1}(\text{Local}))$	-0.168**	-0.165**			-0.169**	-0.167**
	(0.076)	(0.075)			(0.075)	(0.074)
$BGPR^N_{bt}(\mathbf{1}(\text{Cross-border}))$			-0.175	-0.159	-0.179	-0.160
			(0.229)	(0.237)	(0.234)	(0.242)
$BGPR^N_{bt-1}(\mathbf{1}(\text{Cross-border}))$			-0.108	-0.148	-0.198	-0.238
			(0.265)	(0.276)	(0.288)	(0.298)
Bank Controls	No	Yes	No	Yes	No	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	475	461	475	461	475	461
R^2	0.954	0.955	0.952	0.953	0.954	0.955

Note: This table reports results from regressions with log loan origination amount ($orig$) as the dependent variable using data from FR Y-14 for the sample period 2013:Q1 to 2022:Q4. Panel (a) reports results from regressions at the loan level based on Equation (9), using $BGPR^N_{bt}(\mathbf{1}(\text{Local}))$ and $BGPR^N_{bt-1}(\mathbf{1}(\text{Cross-border}))$ which are constructed based on Equation (11). Panel (b) reports results from regressions at the bank level based on Equation (10). Bank-level controls include contemporaneous Tier 1 capital ratio and liquid asset ratio as well as their lagged versions in bank-level regressions. All the geopolitical risk indices are standardized by their respective standard deviations within the sample. Standard errors, shown in parentheses, are clustered at the bank and time level. $^*p < .1$; $^{**}p < .05$; $^{***}p < .01$.

5.3 Additional Results

In the following section, we conduct additional analyses to complement the main findings on the spillover effects of geopolitical risk on domestic lending through global banks and to assess robustness. First, we test Prediction 3 from the model, which examines the role of capital constraints. Second, we investigate whether the threat or the realization of geopolitical risk is the primary driver of spillover effects. Third, we analyze how banks' exposure to geopolitical risk influences their lending standards for domestic loans, leveraging SLOOS data, which covers a broader set of banks and extends further back to the 1980s.

Role of capital constraints. Prediction 3 from the model stipulates that spillover effects are larger for banks with lower capital ratios. To test this, we estimate bank-level regressions with domestic loan origination as the dependent variable and the BGPR indices, along with their interactions with a bank's lagged Tier 1 capital ratio, as the key regressors. If capital constraints influence the spillover effect of geopolitical risk on domestic loan origination, the coefficient on the interactions should be positive, indicating that banks with stronger capital positions reduced loan origination less in response to increasing geopolitical risk abroad.

The results are reported in Panel (a) of Table 7 with Columns (1)–(2) using $BGPR^N$ as the regressor, and Columns (3)–(4) using $BGPR^T$. The coefficients on the interaction terms are positive, supporting the role of capital constraints in amplifying the spillover effects of geopolitical risk.

Geopolitical risk: threat vs. act. Next, we examine the different dimensions of geopolitical risk to assess whether spillover effects are driven more by the threat or the realization of geopolitical risk. This analysis differentiates the impact of anticipated versus actual geopolitical disruptions and evaluates the validity of the model setup in Section 4, where geopolitical risk is primarily modeled as arising from the threat rather than its realization.

As described in Section 2, $BGPR^T$ is designed to be flexible, enabling decomposition into different components. We construct five subindices of $BGPR^T$. $BGPR^{T(Threat)}$ is constructed using the component of CGPR that captures firms' perceptions of the threats of geopolitical risk, while $BGPR^{T(Act)}$ isolates their perceptions of geopolitical risk arising

Table 7: Role of Capital Constraints and Type of Geopolitical Risk

(a) Capital Constraints

$ln(orig_{bt})$	(1)	(2)	(3)	(4)
$BGPR^N_{bt}$	-0.875**	-0.821**		
	(0.363)	(0.357)		
$BGPR^N_{bt}$ x Capital_{bt-1}	0.053**	0.049**		
	(0.022)	(0.022)		
$BGPR^T_{bt}$			-0.442*	-0.331
			(0.247)	(0.250)
$BGPR^T_{bt}$ x Capital_{bt-1}			0.022	0.014
			(0.015)	(0.016)
Capital_{bt-1}	-0.013	-0.011	-0.003	-0.000
	(0.024)	(0.023)	(0.026)	(0.024)
Bank Control	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	477	477	477	477
R^2	0.952	0.952	0.952	0.953

(b) Geopolitical Risk Threat vs. Act (Loan Level)

$ln(orig_{bit})$	(1)	(2)	(3)	(4)	(5)
$BGPR^{T(Threat)}_{bt}$	-0.075***				
	(0.021)				
$BGPR^{T(Act)}_{bt}$		-0.048*			
		(0.025)			
$BGPR^{T^{fin}}_{bt}$			-0.062***		
			(0.021)		
$BGPR^{T^{fin}(Threat)}_{bt}$				-0.061***	
				(0.021)	
$BGPR^{T^{fin}(Act)}_{bt}$					-0.026
					(0.019)
Bank Controls	Yes	Yes	Yes	No	Yes
Loan Controls	Yes	Yes	Yes	No	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes
Firm-time FE	Yes	Yes	Yes	Yes	Yes
Observations	171380	171380	171380	171380	171380
R^2	0.615	0.615	0.615	0.615	0.615

Note: This table reports regression results with log loan origination amount ($orig$) as the dependent variable using data from FR Y-14 for the sample period 2013:Q1 to 2022:Q4. Panel (a) includes $BGPR^N$ (Columns (1) and (2)) or $BGPR^T$ (Columns (3) and (4)), lagged Tier 1 capital ratio, and their respective interactions as key regressors in bank-level regressions. $BGPR^N$ denotes the bank-specific geopolitical risk index, constructed from $CGPR^N$ or the (recent) country-specific geopolitical risk index from Caldara and Iacoviello (2022) according to Equation (1). $BGPR^T$ denotes the bank-specific geopolitical risk index derived from $CGPR^T$, which is based on earnings call transcripts processed through the NL Analytics platform, capturing geopolitical risk perception by firms worldwide. Bank control includes lagged liquid asset ratio. Panel (b) reports results from loan-level regressions with subindices of $BGPR^T$ as the main regressors. $BGPR^{T(Threat)}$ captures firms' perceptions of geopolitical risk threats, and $BGPR^{T(Act)}$ captures their perceptions of geopolitical risk stemming from acts. $BGPR^{T^{fin}}$ captures financial firms' perceptions of geopolitical risk, with $BGPR^{T^{fin}(Threat)}$ and $BGPR^{T^{fin}(Act)}$ denoting its subcomponents for threats and acts, respectively. Bank controls include Tier 1 capital ratio and liquid asset ratio. Loan controls include interest rate and maturity. All the geopolitical risk indices are standardized by their respective standard deviations within the sample. Standard errors, shown in parentheses, are clustered at the bank and time level. *$p < .1$; **$p < .05$; ***$p < .01$.

from realized events (e.g., attacks and wars). Additionally, $BGPR^{Tfin}$ reflects perceptions of geopolitical risk specifically by financial firms, with $BGPR^{Tfin(Threat)}$ and $BGPR^{Tfin(Act)}$ representing the corresponding subcomponents for threats and acts, respectively.

We estimate the impact of each subindex of geopolitical risk on U.S. banks' loan origination to domestic firms using Equation (9) for loan-level regressions and Equation (10) for bank-level regressions. Panel (b) of Table 7 presents the results from the loan-level regressions. Columns (1)–(5) correspond to regressions using $BGPR^{T(Threat)}$, $BGPR^{T(Act)}$, $BGPR^{Tfin}$, $BGPR^{Tfin(Threat)}$, and $BGPR^{Tfin(Act)}$ as the main regressors, respectively. The results indicate that the effect of BGPR on domestic loan origination is primarily driven by perceived threats of geopolitical risk (Columns (1) and (4)), rather than the realization of specific events (Columns (2) and (5)). This underscores the role of uncertainty in generating the spillover effects of geopolitical risk through banks. Moreover, the results in Column (3) show that financial firms' perceptions of geopolitical risk play a particularly strong role in driving the spillover effects, reinforcing the importance of global banks in this transmission channel. Appendix Table A.6 presents the results from the bank-level regressions, which closely mirror those from the loan-level analysis, further supporting these findings.

Overall, the results show that the threat of geopolitical risk has a stronger influence on lending decisions than realized shocks. Banks preemptively adjust exposures to mitigate potential losses, validating the model framework outlined in Section 4.

Domestic lending standards. To supplement our main analysis on loan origination, we examine the spillover effects of geopolitical risk on U.S. banks' domestic lending standards, which have predictive power for loan origination (Niepmann and Schmidt-Eisenlohr (2023)).[24] We use survey data from the SLOOS, which, compared to the FR Y-14 used in the loan origination analysis, has the advantage of covering a larger set of banks and extending farther back in time, beginning in the 1980s.[25]

To measure lending standards, we analyze each bank's response to the survey question on whether it tightened or loosened credit standards for C&I loans to large and medium-sized enterprises, where higher values indicate greater loosening. As is standard in the literature,

[24]See, e.g., Table A.6 in Niepmann and Schmidt-Eisenlohr (2023).

[25]The Federal Reserve surveys up to 80 domestic banks each quarter.

we code responses as 1 for loosening, 0 for no change, and -1 for tightening. We regress this variable on the contemporaneous and lagged quarterly change in BGPR, controlling for bank fixed effects as well as macro and bank-level conditions. Following common practice in the literature (e.g., Bassett et al. (2014)), we include the first lag of the dependent variable to account for the persistence in SLOOS responses.

The baseline regression equation is specified as follows:

$$\begin{aligned} ls_{bt} &= \beta_0 ls_{bt-1} + \beta_1 \Delta \log(BGPR_{bt}) + \beta_2 \Delta \log(BGPR_{bt-1}) + \gamma_1 \Delta X_t + \gamma_2 \Delta X_{t-1} \\ &\quad + \delta_1 Z_{bt} + \delta_2 Z_{bt-1} + \alpha_b + \epsilon_{bt}, \end{aligned} \tag{12}$$

where ls_{bt} represents bank b's response to the SLOOS survey question on lending standards in quarter t, and $BGPR_{bt}$ denotes the BGPR indices. The macroeconomic controls, X_t, include the 2-year Treasury yield, the slope of the yield curve (10y-2y), the CBOE Volatility Index (VIX), the S&P 500 index, and U.S. industrial production. The BGPR index, VIX, S&P 500 index, and industrial production enter as quarterly log changes, while other variables, except the lagged dependent variable, enter as simple changes. The regression also includes bank fixed effects (α_b) and controls for changes in loan demand, based on banks' response to the SLOOS survey question on loan demand, as well as their lagged Tier 1 capital ratio and liquid asset ratio (Z_{bt}).[26]

Panel (a) of Table 8 presents the baseline results for the period 1990:Q2 to 2022:Q2.[27] Columns (1)–(3) use $BGPR^N$ as the main regressor, while Columns (4)–(6) use $BGPR^T$. Columns (1) and (4) include bank fixed effects. Columns (2) and (5) add macroeconomic controls, and Columns (3) and (6) further incorporate bank-level controls, including banks' responses to changes in credit demand, as well as their Tier 1 capital and liquid asset ratios.

[26] We do not include time fixed effects in this regression because their inclusion, alongside bank fixed effects, would leave the regressions reliant solely on cross-sectional variation to identify the effects of BGPR on credit supply. However, the SLOOS outcome variable is inherently limited to three discrete values—tightening, loosening, or no change in credit standards. This constraint means that when two banks experience different levels of increasing exposure to GPR but both tighten credit standards to some extent, the outcome variable still takes the same value (-1) for both. In other words, the coarseness of the outcome variable makes it difficult to precisely capture variation in bank behavior using a purely cross-sectional identification strategy. Unsurprisingly, when time fixed effects are included in the regression, the coefficients associated with BGPR are insignificant.

[27] The sample period slightly varies across specifications depending on data availability when control variables are included.

Across Columns (1)–(3), the coefficients on $BGPR^N$ are negative and statistically significant, often at the 1 percent level, indicating that increased exposure to geopolitical risk, as measured by $BGPR^N$, leads to a significant tightening of lending standards for domestic loans. In terms of magnitude, a one-standard-deviation increase in BGPR leads to 2 percent of banks shifting from maintaining unchanged lending standards to tightening them within the same quarter, with an additional 4 percent tightening in the following quarter (Column 3). The results for $BGPR^T$ in Columns (4)–(6) are consistent with these findings, reinforcing the conclusion that geopolitical risk affects banks' lending standards. These results are consistent with the results on loan origination from Section 5.1, further confirming Prediction 1 from the model.

Parallel to the analysis in Section 5.2, which tests Prediction 2 from the model, we investigate whether the effect of BGPR on bank lending standards is driven by exposure through local claims versus cross-border claims. Panel (b) of Table 8 presents the results, confirming that the tightening effect of BGPR on domestic lending standards is primarily driven by banks' foreign local exposures. This finding aligns with our proposed mechanism, confirms Prediction 2 from the model, and mirrors the corresponding results on loan origination.

Following the earlier analysis, we investigate how different dimensions of geopolitical risk influence banks' domestic lending conditions. Appendix Table A.7 reports results using $BGPR^{T(Threat)}$, $BGPR^{T(Act)}$, $BGPR^{Tfin(Threat)}$, and $BGPR^{Tfin(Act)}$ to capture banks' exposure to geopolitical risk. These findings are consistent with our earlier results based on the FR Y-14 data, further confirming that banks respond more strongly to geopolitical risk stemming from perceived threats rather than realized acts.

While our primary focus is on C&I loans, Appendix Table A.8 shows that banks also tighten lending standards on commercial real estate loans in response to geopolitical risk. This finding provides additional evidence that banks contract their domestic credit supply when foreign geopolitical risk increases. Notably, the U.S. commercial real estate sector is less directly affected by geopolitical risk compared to industries such as trade and manufacturing, which are more exposed to risks abroad. This result further confirms that our findings on spillover effects are unlikely to be driven by credit demand responses.

Table 8: Geopolitical Risk and Domestic Lending Standards

(a) Baseline

ls_{bt}	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta \log(BGPR^N_{bt})$	-0.023***	-0.015**	-0.023**			
	(0.008)	(0.007)	(0.011)			
$\Delta \log(BGPR^N_{bt-1})$	-0.019**	-0.014*	-0.037***			
	(0.008)	(0.008)	(0.012)			
$\Delta \log(BGPR^T_{bt})$				-0.008	-0.032***	-0.034***
				(0.011)	(0.011)	(0.012)
$\Delta \log(BGPR^T_{bt-1})$				-0.005	-0.014	-0.011
				(0.010)	(0.010)	(0.010)
Macro Controls	No	Yes	Yes	No	Yes	Yes
Bank Controls	No	No	Yes	No	No	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3099	3050	2095	1486	1486	1476
R^2	0.235	0.294	0.331	0.258	0.339	0.352

(b) Role of Local vs. Cross-border Foreign Exposures

ls_{bt}	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta \log(BGPR^N_{bt}$ (**1**(Local)))	-0.027**		-0.021*			
	(0.011)		(0.011)			
$\Delta \log(BGPR^N_{bt-1}$ (**1**(Local)))	-0.031***		-0.025**			
	(0.012)		(0.012)			
$\Delta \log(BGPR^N_{bt}$ (**1**(Cross-border)))		-0.020**	-0.011			
		(0.008)	(0.009)			
$\Delta \log(BGPR^N_{bt-1}$ (**1**(Cross-border)))		-0.025**	-0.013			
		(0.010)	(0.011)			
$\Delta \log(BGPR^T_{bt}$ (**1**(Local)))				-0.038***		-0.039***
				(0.013)		(0.015)
$\Delta \log(BGPR^T_{bt-1}$ (**1**(Local)))				-0.010		-0.010
				(0.013)		(0.015)
$\Delta \log(BGPR^T_{bt}$ (**1**(Cross-border)))					-0.004	0.011
					(0.011)	(0.013)
$\Delta \log(BGPR^T_{bt-1}$ (**1**(Cross-border)))					-0.017*	-0.014
					(0.010)	(0.012)
Macro Controls	Yes	Yes	Yes	Yes	Yes	Yes
Bank Controls	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1303	2067	1275	1019	1264	808
R^2	0.340	0.330	0.339	0.341	0.338	0.323

Note: This table reports bank-level regression results, where the dependent variable is banks' response to the SLOOS survey question on tightening, maintaining, or loosening credit standards for C&I loans to large and medium-sized firms, using a sample spanning from 1990:Q2 to 2022:Q2. Panel (a) reports results based on Equation (12), where $BGPR^N$ (Columns (1)–(3)) is the bank-specific geopolitical risk index constructed from $CGPR^N$, the country-specific geopolitical risk index from Caldara and Iacoviello (2022), using Equation (1). $BGPR^T$ (Columns (4)–(6)) is the bank-specific geopolitical risk index derived from $CGPR^T$, which captures firms' geopolitical risk perceptions based on earnings call transcripts processed through the NL Analytics platform. Columns (2) and (5) add macroeconomic controls, including (log) changes in the 2-year Treasury yield, the yield curve slope (10y–2y), the CBOE Volatility Index (VIX), the S&P 500 index, and U.S. industrial production. Columns (3) and (6) further control for loan demand, as well as banks' liquid asset and Tier 1 capital ratios. In Panel (b), $BGPR^N_{bt}$ (**1**(Local)) and $BGPR^N_{bt}$ (**1**(Cross-border)) are constructed following Equation (11). All specifications include bank fixed effects, macroeconomic controls, bank-level controls, and the lagged dependent variable as a regressor. For both panels, the geopolitical risk indices are standardized by their respective standard deviations within the sample. Standard errors, shown in parentheses, are clustered at the bank and time level. $^*p < .1$; $^{**}p < .05$; $^{***}p < .01$.

6 Conclusion

This paper studies the impact of geopolitical risk on banks' foreign operations and the resulting spillover effects on domestic credit supply. Using a combination of established and newly-constructed geopolitical risk indices and multiple supervisory data covering U.S. bank lending activities spanning nearly four decades, we find that geopolitical risk significantly increases the credit risk of these banks. Despite this heightened risk, banks continue lending through their foreign branches and subsidiaries while scaling back cross-border lending. This asymmetric response is unique to geopolitical risk, as banks do not adjust their foreign operations in the same way in response to other types of risk.

We develop a stylized model to explain these findings, emphasizing how banks' funding structures and expropriation risk drive their responses to geopolitical risk. The model highlights that foreign affiliates rely on local funding, which is not repaid in the event of expropriation, reducing banks' incentives to scale back local operations. In contrast, cross-border lending remains more directly exposed to geopolitical risk, as it is funded domestically and must be repaid regardless of adverse geopolitical developments. This distinction explains why banks reduce cross-border exposure while maintaining affiliate-based lending.

These dynamics also generate significant spillover effects on domestic credit supply. We show that U.S. banks facing geopolitical risk abroad reduce lending to domestic firms, with the effect strongest when the risk originates in countries where banks operate through local affiliates. This underscores the importance of banks' foreign operational structures in shaping how geopolitical shocks transmit to the domestic economy.

Our findings highlight the critical role of global banks in transmitting geopolitical shocks, shaping both international and domestic credit conditions. These insights have important implications for policymakers and regulators, particularly in assessing the stability of cross-border banking networks in an era of rising geopolitical tensions. Future research could further explore the interaction between geopolitical risk, financial regulation, and banks' strategic responses, as well as the broader macroeconomic consequences of geopolitical instability on global capital flows.

References

Ahir, Hites, Nicholas Bloom, and Davide Furceri, "The world uncertainty index," Technical Report, National bureau of economic research 2022.

Akinci, Ozge, Sebnem Kalemli-Özcan, and Albert Queralto, "Uncertainty Shocks, Capital Flows, and International Risk Spillovers," Technical Report, National Bureau of Economic Research 2022.

Alfaro, Laura and Davin Chor, "Global Supply Chains: The Looming 'Great Reallocation'," 2023. Jackson Hole Economic Policy Symposium.

Alsagr, Naif and Stefan F. Van Hemmen Almazor, "Oil Rent, Geopolitical Risk and Banking Sector Performance," *International Journal of Energy Economics and Policy*, Aug. 2020, *10* (5), 305–314.

Amiti, Mary, Sang Hoon Kong, and David Weinstein, "The Effect of the US-China Trade war on US Investment," Technical Report, National Bureau of Economic Research 2020.

Bassett, William F, Mary Beth Chosak, John C Driscoll, and Egon Zakrajšek, "Changes in Bank Lending Standards and the Macroeconomy," *Journal of Monetary Economics*, 2014, *62*, 23–40.

Bruno, Valentina and Hyun Song Shin, "Cross-border banking and global liquidity," *The Review of Economic Studies*, 2015, *82* (2), 535–564.

Buch, Claudia, Cathérine T. Koch, and Michael Koetter, "Size, productivity, and international banking," *Journal of International Economics*, 2011, *85* (2), 329–334.

Caldara, Dario and Matteo Iacoviello, "Measuring Geopolitical Risk," *American Economic Review*, 2022, *112* (4), 1194–1225.

Cetorelli, Nicola and Linda S Goldberg, "Banking Globalization and Monetary Transmission," *The Journal of Finance*, 2012, *67* (5), 1811–1843.

Choi, Sangyup and Davide Furceri, "Uncertainty and cross-border banking flows," *Journal of International Money and Finance*, 2019, *93*, 260–274.

Clayton, Christopher, Matteo Maggiori, and Jesse Schreger, "A Framework for Geopolitics and Economics," 2023. Working Paper.

Correa, Ricardo, Julian Di Giovanni, Linda S. Goldberg, and Camelia Minoiu, "Trade uncertainty and U.S. bank lending," Staff Reports 1076, New York, NY 2023.

_ , Teodora Paligorova, Horacio Sapriza, and Andrei Zlate, "Cross-border bank flows and monetary policy," *The Review of Financial Studies*, 2022, *35* (1), 438–481.

Dell'Ariccia, Giovanni and Robert Marquez, "Risk and the Corporate Structure of Banks," *The Journal of Finance*, 2010, *65* (3), 1075–1096.

Demir, Ender and Gamze Ozturk Danisman, "The Impact of Economic Uncertainty and Geopolitical Risks on Bank Credit," *The North American Journal of Economics and Finance*, 2021, *57*, 101444.

Drott, Constantin, Stefan Goldbach, and Volker Nitsch, "The effects of sanctions on Russian banks in TARGET2 transactions data," *Journal of Economic Behavior & Organization*, 2024, *219*, 38–51.

Efing, Matthias, Stefan Goldbach, and Volker Nitsch, "Freeze! Financial Sanctions and Bank Responses," *The Review of Financial Studies*, 05 2023, *36* (11), 4417–4459.

Fajgelbaum, Pablo D, Pinelopi K Goldberg, Patrick J Kennedy, and Amit K Khandelwal, "The Return to Protectionism," *The Quarterly Journal of Economics*, 2020, *135* (1), 1–55.

Fajgelbaum, Pablo, Pinelopi K Goldberg, Patrick J Kennedy, Amit Khandelwal, and Daria Taglioni, "The US-China Trade War and Global Reallocations," 2021. National Bureau of Economic Research Working Paper.

Federico, Stefano, Fadi Hassan, and Veronica Rappoport, "Trade Shocks and Credit Reallocation," NBER Working Papers 31111, National Bureau of Economic Research, Inc April 2023.

Fillat, José L., Stefania Garetto, and Arthur V. Corea-Smith, "Global banking and the international transmission of shocks: A quantitative analysis," *Journal of International Economics*, 2023, *145*, 103808.

Hale, Galina, Tümer Kapan, and Camelia Minoiu, "Shock Transmission through Cross-border Bank Lending: Credit and Real Effects," *The Review of Financial Studies*, 2020, *33* (10), 4839–4882.

Hassan, Tarek A, Stephan Hollander, Laurence Van Lent, and Ahmed Tahoun, "Firm-level Political Risk: Measurement and Effects," *The Quarterly Journal of Economics*, 2019, *134* (4), 2135–2202.

Hassan, Tarek Alexander, Jesse Schreger, Markus Schwedeler, and Ahmed Tahoun, "Sources and Transmission of Country Risk," *The Review of Economic Studies*, 2023. Forthcoming.

Huber, Kilian, "Disentangling the effects of a banking crisis: Evidence from German firms and counties," *American Economic Review*, 2018, *108* (3), 868–898.

Ivashina, V., D. S. Scharfstein, and J. C Stein, "Dollar Funding and the Lending Behavior of Global Banks," *Quarterly Journal of Economics*, 2015, *130* (3), 1241–1281.

Jiang, Zhengyang, Arvind Krishnamurthy, and Hanno Lustig, "Dollar Safety and the Global Financial Cycle," Technical Report, National Bureau of Economic Research 2020.

Kalemli-Özcan, Sebnem, "U.S. Monetary Policy and International Risk Spillovers," *Proceedings of the Jackson Hole Symposium*, 2019.

Kalemli-Ozcan, Sebnem, Elias Papaioannou, and Fabrizio Perri, "Global Banks and Crisis Transmission," *Journal of international Economics*, 2013, *89* (2), 495–510.

Khwaja, Asim Ijaz and Atif Mian, "Tracing the impact of bank liquidity shocks: Evidence from an emerging market," *American Economic Review*, 2008, *98* (4), 1413–1442.

Mamonov, Mikhail, Anna Pestova, and Steven Ongena, "How Banks Anticipate and Propagate Global Financial Sanctions," *Swiss Finance Institute Research Paper*, 2022, (23-59).

Niepmann, Friederike, "Banking across borders," *Journal of International Economics*, 2015, *96* (2), 244–265.

_ , "Banking across borders with heterogeneous banks," *Journal of International Economics*, 2023, *142* (C), S002219962300034X.

_ **and Tim Schmidt-Eisenlohr**, "Institutional investors, the dollar, and U.S. credit conditions," *Journal of Financial Economics*, 2023, *147* (1), 198–220.

Peek, Joe and Eric S Rosengren, "Collateral Damage: Effects of the Japanese Bank Crisis on Real Activity in the United States," *American Economic Review*, 2000, *90* (1), 30–45.

Pham, Tho, Oleksandr Talavera, and Andriy Tsapin, "Shock contagion, asset quality and lending behaviour: The case of war in Eastern Ukraine," *Kyklos*, 2021, *74* (2), 243–269.

Phan, Dinh Hoang Bach, Vuong Thao Tran, and Bernard Njindan Iyke, "Geopolitical Risk and Bank Stability," *Finance Research Letters*, 2022, *46*, 102453.

Rey, Hélène, "International Channels of Transmission of Monetary Policy and the Mundellian Trilemma," *IMF Economic Review*, 2016, *64* (1), 6–35.

Schnabl, Philipp, "The International Transmission of Bank Liquidity Shocks: Evidence from an Emerging Market," *The Journal of Finance*, 2012, *67* (3), 897–932.

Shen, Leslie Sheng and Tony Zhang, "Risk Sharing and Amplification in the Global Financial Network," *SSRN 4032741*, 2024.

Temesvary, Judit and Andrew Wei, "Domestic lending and the pandemic: How does banks' exposure to COVID-19 abroad affect their lending in the United States?," *Journal of International Money and Finance*, 2024, *143*, 103054.

Wang, Xinjie, Yangru Wu, and Weike Xu, "Geopolitical Risk and Investment," *Journal of Money, Credit and Banking, Forthcoming*, 2019.

Online Appendix

Geopolitical Risk and Global Banking

Friederike Niepmann and Leslie Sheng Shen

March 2025

A Additional Materials on Geopolitical Risk Indices

Table A.1: Search Query for CGPR Index based on Earnings Call Transcripts

Panel A. Search Categories and Search Queries

Category	Search queries
Threats	
1. War threats	War words AND threat words
2. Peace threats	Peach words AND peach disruption words
3. Military buildup	Military words AND buildup words
4. Nuclear threats	Nuclear bigrams AND threat words
5. Terrorist threats	Terrorist words AND threat words
Acts	
6. Beginning of war	War words AND war begin words
7. Escalation of war	Actors words AND actors fight words
8. Terrorist acts	Terrorist words AND terrorism act words

Panel B. Search Words

Topic sets	Phrases
War words	war OR conflict OR hostilities OR revolution* OR insurrection OR uprising OR revolt OR coup OR geopolitical
Peace words	peace OR truce OR armistice OR treaty OR parley
Military words	military OR troops OR missile* OR "arms" OR weapon* OR bomb* OR warhead*
Nuclear bigrams	"nuclear war*" OR "atomic war*" OR "nuclear missile*" OR "nuclear bomb*" OR "atomic bomb*" OR "h-bomb*" OR "hydrogen bomb*" OR "nuclear test" OR "nuclear weapon*"
Terrorism words	terror* OR guerrilla* OR hostage*
Actors words	allies* OR enemy* OR insurgent* OR foe* OR army OR navy OR aerial OR troops OR rebels

Threat/act sets	Phrases
Threat words	threat* OR warn* OR fear* OR risk* OR concern* OR danger* OR doubt* OR crisis OR trouble* OR dispute* OR tension* OR imminent* OR inevitable OR footing OR menace* OR brink OR scare OR peril*
Peace_disruption_words	threat* OR menace* OR reject* OR peril* OR boycott* OR disrupt*
Buildup_words	buildup* OR build-up* OR sanction* OR blockade* OR embargo OR quarantine OR ultimatum OR mobilize*
War_begin_words	begin* OR start* OR declar* OR begun OR began OR outbreak OR "broke out" OR breakout OR proclamation OR launch*
Actor_fight_words	advance* OR attack* OR strike* OR drive* OR shell* OR offensive OR invasion OR invade* OR clash* OR raid* OR launch*
Terrorism_act_words	attack OR act OR bomb* OR kill* OR strike* OR hijack*

Panel C. Excluded words

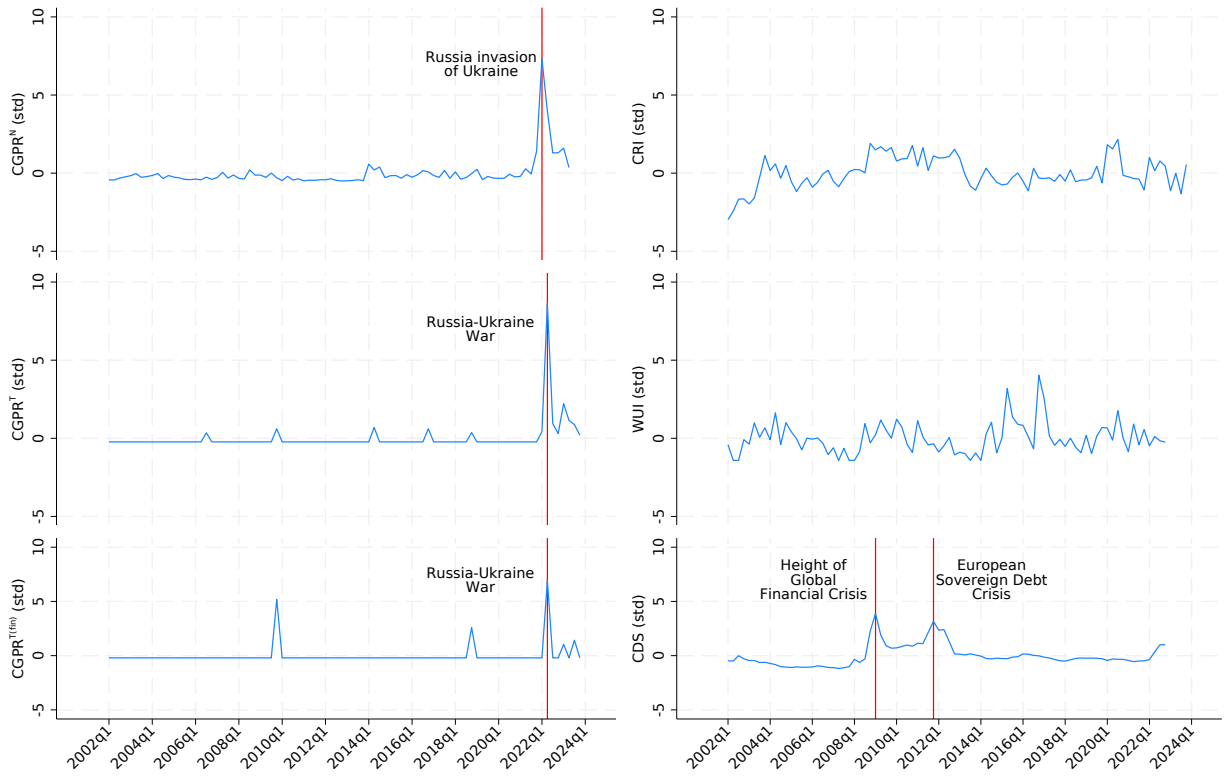
Exclusion words	movie* OR film* OR museum* OR anniversary* OR obituary* OR memorial* OR arts OR book OR books OR memoir* OR "price war" OR game OR story OR history OR veteran* OR tribute* OR sport OR music OR racing OR cancer OR "real estate" OR mafia OR trial OR tax

Note: This table lists the search query used to construct the country-specific geopolitical risk index based on earnings call transcripts ($CGPR^T$). The query is based on the one in Caldara and Iacoviello (2022) with slight modification. The truncation character (*) denotes a search including all possible endings of a word, e.g. "threat*" includes "threat" or "threats" or "threatening."

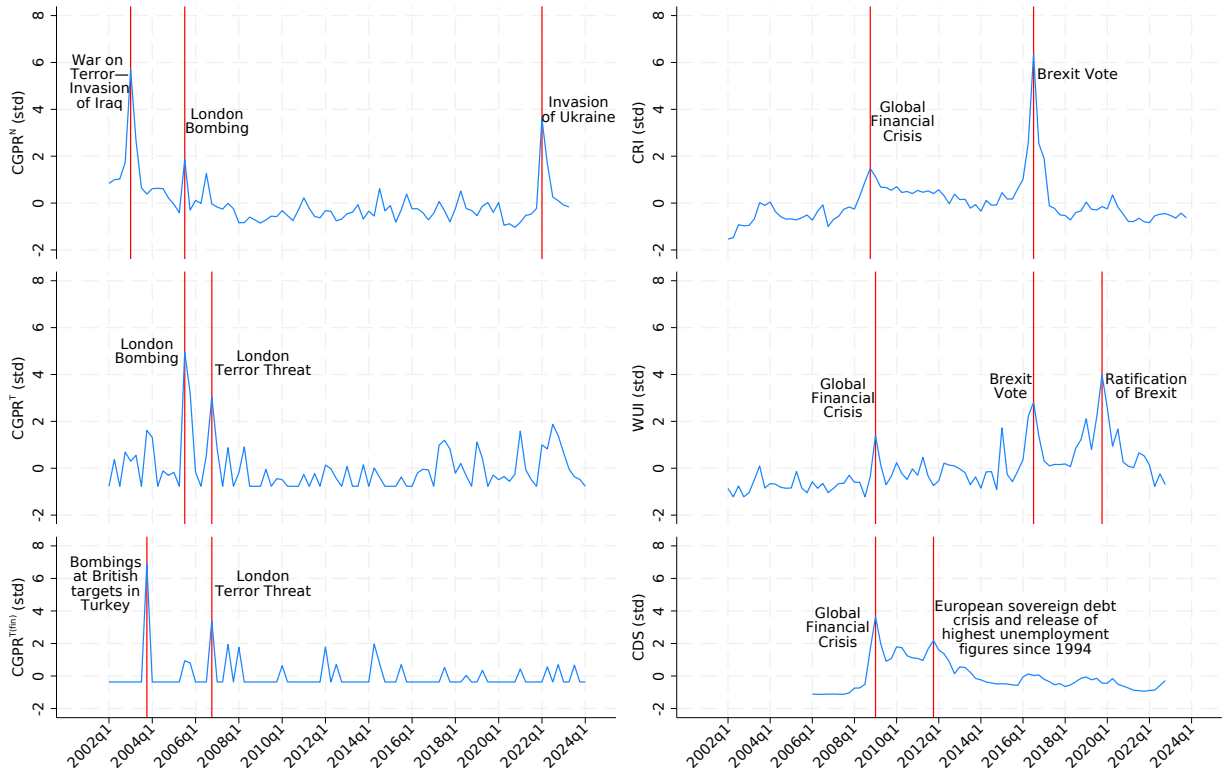
****

Figure A.1: Country-specific Geopolitical Risk and Other Risk Indices

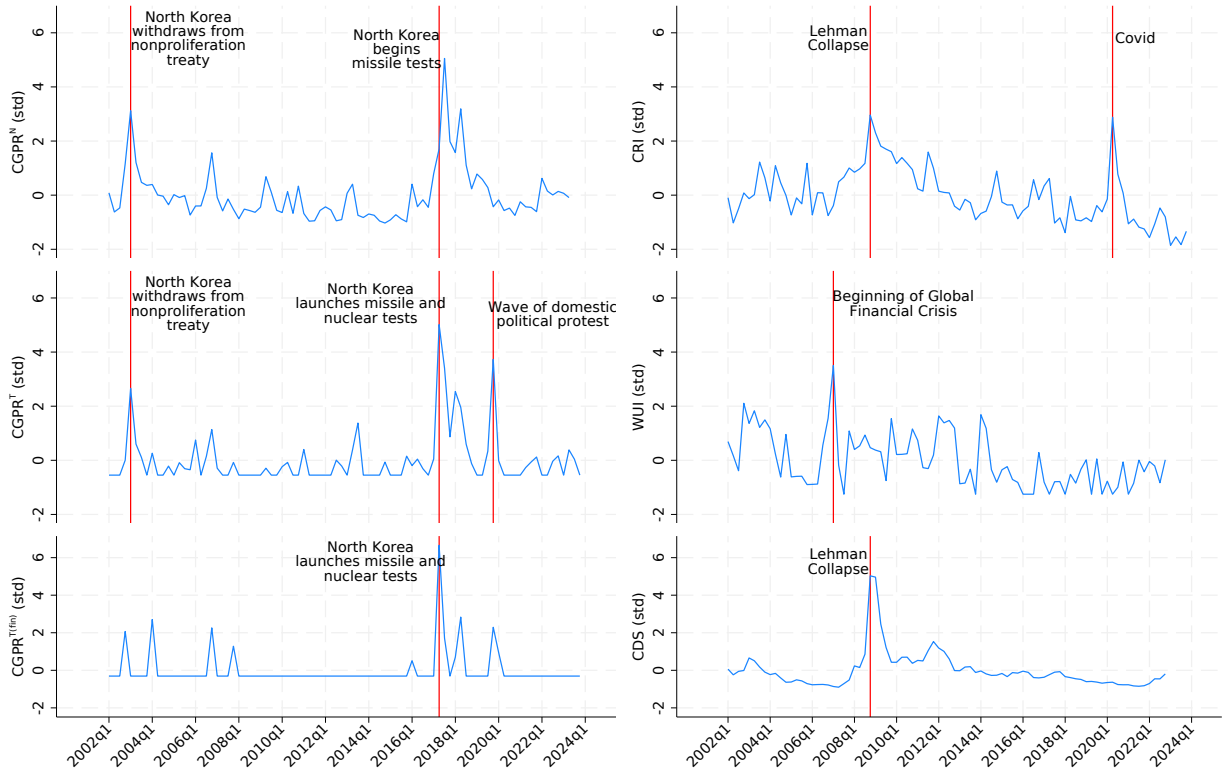
(a) Poland



(b) United Kingdom



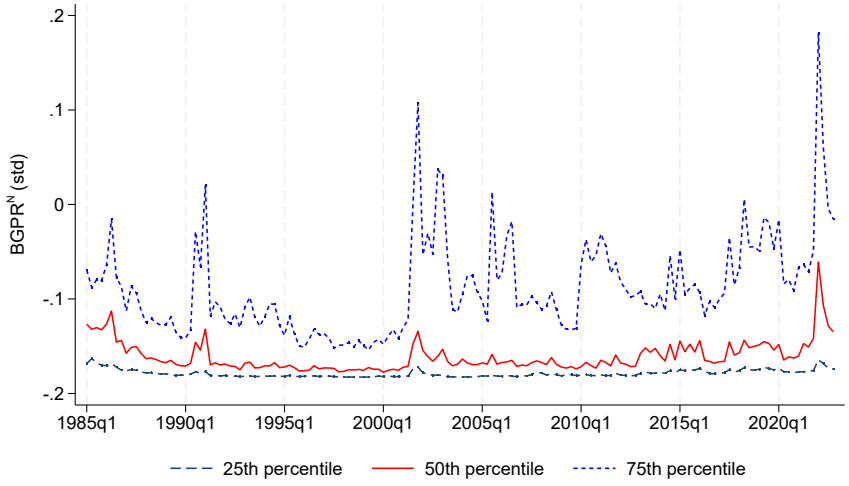
(c) South Korea



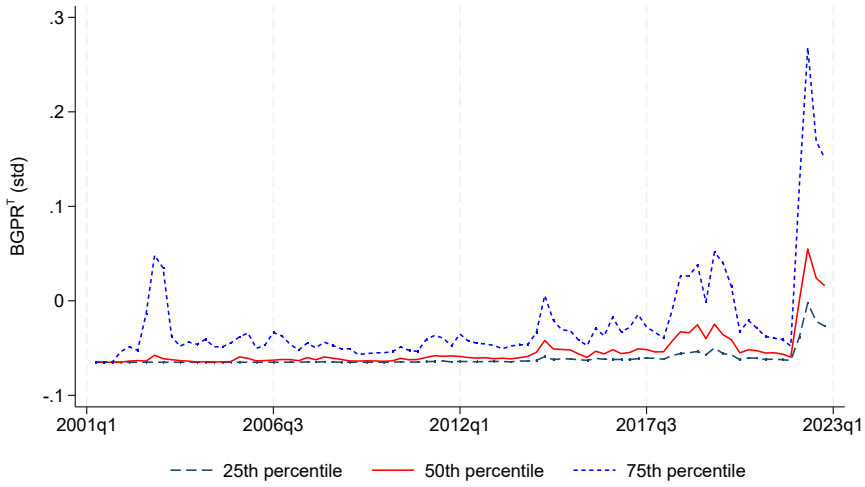
Note: Panels (a), (b), and (c) illustrate the country-specific geopolitical risk (CGPR) indices and other risk indices for Poland, the United Kingdom, and South Korea, respectively, covering the period from 2002:Q1 to 2023:Q4. In each panel, the left charts, from top to bottom, display CGPR from Caldara and Iacoviello (2022) ($CGPR^N$), CGPR constructed by applying textual analysis to earnings call transcripts using the NL Analytics platform ($CGPR^T$), and a sub-index of $CGPR^T$ constructed based solely on earnings call transcripts of financial firms ($CGPR^T(fin)$. The right charts display the country risk index (CRI) by Hassan et al. (2023) (top), the World Uncertainty Index (WUI) by Ahir et al. (2022) (middle), and the 5-year CDS spread (bottom) for the respective countries. All indices are standardized by their respective standard deviations within the sample.

Figure A.2: Bank-specific Geopolitical Risk Indices

(a) $BGPR^N$



(b) $BGPR^T$



Note: Panels (a) and (b) show the bank-specific geopolitical risk (BGPR) indices constructed based on Equation (1) using $CGPR^N$ and $CGPR^T$, respectively, over the period 1985:Q1–2023:Q4 and 2002:Q1–2023:Q4. See the notes under Appendix Figure A.1 for sources and definitions of the CGPR indices. Each panel illustrates the BGPR indices at the 25th, 50th, and 75th percentile. Data source(s): FFIEC 009, FR Y-9C, and Call Reports.

B Supplementary Regression Tables

Table A.1: Response of Banks' Local Claims to Geopolitical Risk, Local versus Foreign Currency Claims, $CGPR^N$

	Foreign currency		Local currency	
$ln(exp_{bct})$	(1)	(2)	(3)	(4)
$CGPR^N_{ct}$	-0.027	-0.030	-0.032*	-0.030*
	(0.026)	(0.028)	(0.018)	(0.017)
$CGPR^N_{ct}$	0.052	0.047	-0.020	-0.019
	(0.036)	(0.038)	(0.017)	(0.016)
$\mathbf{1}(Sanction)_t$		0.289***		-0.078**
		(0.061)		(0.039)
$ln(Exch.Rate)_t$		-1.076***		-0.158***
		(0.385)		(0.056)
$ln(StockIndex)_t$		-0.067		0.031
		(0.240)		(0.148)
$ln(Exch.Rate)_{t-1}$		0.625		-0.028
		(0.392)		(0.055)
$ln(StockIndex)_{t-1}$		0.035		-0.060
		(0.234)		(0.145)
Bank-country FE	Yes	Yes	Yes	Yes
Bank-time FE	Yes	Yes	Yes	Yes
Observations	8038	7709	18947	18059
R^2	0.887	0.888	0.903	0.907

Note: This table reports results from regressions at the bank-country-time level based on Equation (5) using the FFEIC 009 data for the sample period 1986:Q1 to 2022:Q4. $CGPR^N$ denotes the (recent) country-specific geopolitical risk index from Caldara and Iacoviello (2022). The dependent variable is the log local claims in foreign currency in Columns (1)–(2) and log local claims in local currency in Columns (3)–(4). Columns (1) and (3) show the baseline results for each dependent variable. Columns (2) and (4) add country-level macro controls, including a country's log exchange rate vis-à-vis the U.S. dollar, log domestic stock price index, and an indicator variable equal to 1 if the country faces any sanctions from the United States. All regressions include bank-country and country-time fixed effects. $CGPR^N$ is standardized by its respective standard deviation within the sample. Standard errors, shown in parentheses, are clustered at the country and time level. *$p < .1$; **$p < .05$; ***$p < .01$.

Table A.2: Response of Banks' Foreign Operations to Geopolitical Risk, $CGPR^T$

	Total		Cross-border		Local	
$ln(exp_{bct})$	(1)	(2)	(3)	(4)	(5)	(6)
$CGPR^T_{ct}$	-0.016*	-0.016*	-0.023**	-0.023**	-0.015	-0.014
	(0.009)	(0.009)	(0.012)	(0.011)	(0.018)	(0.018)
$CGPR^T_{ct-1}$	-0.000	-0.001	-0.004	-0.004	-0.010	-0.011
	(0.009)	(0.008)	(0.011)	(0.010)	(0.026)	(0.026)
$\mathbf{1}(Sanction)_t$		-0.120***		-0.140***		-0.246***
		(0.031)		(0.034)		(0.052)
$ln(Exch.Rate)_t$		-0.009		-0.004		-0.163***
		(0.008)		(0.011)		(0.056)
$ln(StockIndex)_t$		0.081		0.155*		0.200
		(0.071)		(0.081)		(0.161)
$ln(Exch.Rate)_{t-1}$		0.009		0.011		-0.016
		(0.009)		(0.012)		(0.058)
$ln(StockIndex)_{t-1}$		-0.120*		-0.176**		-0.198
		(0.063)		(0.072)		(0.154)
Bank-country FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	35515	33501	34813	32826	11587	11094
R^2	0.947	0.949	0.936	0.937	0.938	0.942

Note: This table reports results from regressions at the bank-country-time level based on Equation (5) using the FFEIC 009 data covering the sample period 2013:Q1 to 2022:Q4. $CGPR^T$ denotes the country-specific geopolitical risk index constructed based on earnings call transcripts using the NL Analytics platform. The dependent variable the log total foreign claims in Columns (1)–(3), log cross-border claims in Columns (4)–(6), and log local claims in Columns (7)–(9). Columns (1), (4), and (7) show the baseline results for each dependent variable. Columns (2), (5), and (8) add country-level macro controls, including a country's log exchange rate vis-à-vis the U.S. dollar, log domestic stock price index, and an indicator variable that takes the value 1 if the country faces any sanctions from the United States. All regressions include bank-country and country-time fixed effects. $CGPR^T$ is standardized by its respective standard deviation within the sample. Standard errors, shown in parentheses, are clustered at the country and time level. *$p < .1$; **$p < .05$; ***$p < .01$.

Table A.3: Response of Banks' Foreign Operations to Geopolitical Risk, by Ex-ante Local Liability Share

	Total Exp.		Local		Cross-border	
	(1)	(2)	(3)	(4)	(5)	(6)
$CGPR^N_{ct}$	-0.018**	-0.021**	0.003	0.001	-0.027***	-0.030***
	(0.009)	(0.010)	(0.015)	(0.016)	(0.010)	(0.010)
$CGPR^N_{ct} \times LL^{Shr}_{bct-1}$	0.003	0.001	0.013	0.015	-0.013	-0.013
	(0.005)	(0.005)	(0.011)	(0.011)	(0.009)	(0.009)
$CGPR^N_{ct-1}$	-0.014	-0.019*	0.004	0.001	-0.019*	-0.023**
	(0.009)	(0.010)	(0.014)	(0.015)	(0.010)	(0.012)
$CGPR^N_{ct-1} \times LL^{Shr}_{bct-2}$	0.015***	0.014***	0.026**	0.027**	-0.005	-0.004
	(0.006)	(0.006)	(0.012)	(0.012)	(0.008)	(0.009)
LL^{Shr}_{bct-1}	-0.014**	-0.016**	-0.021	-0.024*	-0.022**	-0.022**
	(0.007)	(0.007)	(0.013)	(0.013)	(0.010)	(0.011)
LL^{Shr}_{bct-2}	0.017***	0.016**	0.032**	0.037**	0.010	0.009
	(0.007)	(0.007)	(0.016)	(0.016)	(0.010)	(0.010)
Macro Controls	No	Yes	No	Yes	No	Yes
Bank-country	Yes	Yes	Yes	Yes	Yes	Yes
Bank-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	94336	77649	30303	27420	93173	76556
R^2	0.911	0.919	0.886	0.894	0.891	0.900

Note: This table reports results from regressions at the bank-country-time level based on an augmented version of Equation (5) using the FFEIC 009 data for the sample period 1986:Q1 to 2022:Q4. $CGPR^N$ denotes the (recent) country-specific geopolitical risk index from Caldara and Iacoviello (2022). LL^{Shr}_{bct-1} denotes the local liabilities for bank b from country c as a share of its total lending to that country, calculated as a four-quarter moving average from $t-4$ to $t-1$. The dependent variable is the log total foreign claims in Columns (1)–(2), log local claims in Columns (3)–(4), and log cross-border claims in Columns (5)–(6). Columns (1), (3), and (5) show the baseline results for each dependent variable. Columns (2), (4), and (6) add country-level macro controls, including a country's log exchange rate vis-à-vis the U.S. dollar, log domestic stock price index, and an indicator variable equal to 1 if the country faces any sanctions from the United States. All regressions include bank-country and country-time fixed effects. $CGPR^N$ is standardized by its respective standard deviation within the sample. Standard errors, shown in parentheses, are clustered at the country and time level. *$p < .1$; **$p < .05$; ***$p < .01$.

Table A.4: Other Risks and Banks' Foreign Operations, by Ex-ante Local Liability Position

	CRI			WUI			CDS		
	(1) Tot	(2) LC	(3) XB	(4) Tot	(5) LC	(6) XB	(7) Tot	(8) LC	(9) XB
CRI_t	0.000	0.022	-0.014						
	(0.014)	(0.018)	(0.016)						
$CRI_t \times LL^{Shr}_{bct-1}$	0.004	-0.003	0.002						
	(0.007)	(0.012)	(0.008)						
CRI_{t-1}	-0.001	0.029	-0.006						
	(0.014)	(0.019)	(0.015)						
$CRI_{t-1} \times LL^{Shr}_{bct-2}$	0.011	0.016	0.005						
	(0.007)	(0.014)	(0.007)						
WUI_t				0.010**	0.003	0.007			
				(0.005)	(0.008)	(0.005)			
$WUI_t \times LL^{Shr}_{bct-1}$				-0.002	0.007	-0.006**			
				(0.002)	(0.006)	(0.003)			
WUI_{t-1}				-0.001	0.004	-0.004			
				(0.005)	(0.008)	(0.005)			
$WUI_{t-1} \times LL^{Shr}_{bct-2}$				0.005**	0.002	0.001			
				(0.002)	(0.006)	(0.003)			
$ln(CDS)_t$							0.030	-0.015	0.035
							(0.041)	(0.049)	(0.051)
$ln(CDS)_t \times LL^{Shr}_{bct-1}$							0.008	0.027*	-0.003
							(0.011)	(0.015)	(0.012)
$ln(CDS)_{t-1}$							0.015	-0.197***	0.048
							(0.038)	(0.049)	(0.046)
$ln(CDS)_{t-1} \times LL^{Shr}_{bct-2}$							-0.003	-0.002	-0.000
							(0.010)	(0.016)	(0.011)
LL^{Shr}_{bct-1}	-0.016	-0.020*	-0.018	-0.015**	-0.031**	-0.018*	-0.044	-0.108**	-0.010
	(0.010)	(0.012)	(0.012)	(0.006)	(0.015)	(0.010)	(0.034)	(0.055)	(0.039)
LL^{Shr}_{bct-2}	-0.002	0.007	0.006	0.013*	0.038**	0.011	0.025	0.029	0.013
	(0.010)	(0.014)	(0.011)	(0.007)	(0.018)	(0.009)	(0.032)	(0.062)	(0.034)
Macro Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank-country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank-time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13183	12631	12521	15171	14490	14347	14654	13982	13803
R^2	0.960	0.943	0.922	0.959	0.940	0.922	0.961	0.941	0.922

Note: This table reports results from regressions at the bank-country-time level based on an augmented version of Equation (5) with alternative country-specific risk indices as the main regressor (instead of $CGPR$). The alternative indices include CRI by Hassan et al. (2023) (Columns (1)–(3)), WUI by Ahir et al. (2022) (Columns (4)–(6), and log sovereign CDS spreads (Columns (7)–(9)). LL^{Shr}_{bct-1} denotes the local liabilities for bank b from country c as a share of its total lending to that country, calculated as a four-quarter moving average from $t-4$ to $t-1$. The dependent variable is the log total foreign claims in Columns (1)–(3), log local claims in Columns (4)–(6), and log cross-border claims in Columns (7)–(9). All regressions include country-level macro controls, including a country's log exchange rate vis-à-vis the U.S. dollar, log domestic stock price index, and an indicator variable equal to 1 if the country faces any sanctions from the United States, as well as bank-country and country-time fixed effects. Standard errors, shown in parentheses, are clustered at the country and time level. *$p < .1$; **$p < .05$; ***$p < .01$.

Table A.5: Geopolitical Risk Transmission: Cross-border vs. Local Exposure, $BGPR^T$

(a) Loan Level

$orig_{bit}$	(1)	(2)	(3)	(4)	(5)	(6)
$BGPR^T_{bt}$ ($\mathbf{1}$(Local))	-0.059***	-0.053**			-0.064***	-0.057***
	(0.020)	(0.021)			(0.020)	(0.020)
$BGPR^T_{bt}$ ($\mathbf{1}$(Cross-border))			-0.051	-0.050	0.263	0.228
			(0.347)	(0.366)	(0.342)	(0.351)
Bank Controls	No	Yes	No	Yes	No	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	205642	199753	205642	199753	205642	199753
R^2	0.594	0.592	0.594	0.592	0.594	0.592

(b) Bank Level

$orig_{bt}$	(1)	(2)	(3)	(4)	(5)	(6)
$BGPR^T_{bt}$($\mathbf{1}$(Local))	-0.035	-0.036			-0.031	-0.032
	(0.060)	(0.060)			(0.057)	(0.057)
$BGPR^T_{bt-1}$($\mathbf{1}$(Local))	-0.144**	-0.149**			-0.156***	-0.159***
	(0.059)	(0.059)			(0.058)	(0.059)
$BGPR^T_{bt}$($\mathbf{1}$(Cross-border))			-0.822	-0.769	-1.358	-1.309
			(0.868)	(0.857)	(0.911)	(0.893)
$BGPR^T_{bt-1}$($\mathbf{1}$(Cross-border))			0.565	0.616	0.944	1.015
			(0.776)	(0.780)	(0.880)	(0.871)
Bank Controls	No	Yes	No	Yes	No	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	475	475	475	475	475	475
R^2	0.955	0.956	0.952	0.952	0.955	0.956

Note: This table reports results from regressions with log loan origination amount ($orig$) as the dependent variable using data from FR Y-14 for the sample period 2013:Q1 to 2022:Q4. Panel (a) reports results from regressions at the loan level based on Equation (9), using a modified $BGPR$ constructed using Equation (11). Panel (b) reports results from regressions at the bank-time level based on Equation (10). Bank controls include lagged Tier 1 capital ratio and liquid asset ratio. All the geopolitical risk indices are standardized by their respective standard deviations within the sample. Standard errors, shown in parentheses, are clustered at the bank and time level. *$p < .1$; **$p < .05$; ***$p < .01$.

Table A.6: Geopolitical Risk and Domestic Loan Origination: Threat vs. Act (Bank Level)

$orig_{bt}$	(1)	(2)	(3)	(4)	(5)
$BGPR_{bt}^{T(Threat)}$	-0.049				
	(0.069)				
$BGPR_{bt-1}^{T(Threat)}$	-0.171**				
	(0.069)				
$BGPR_{bt}^{T(Act)}$		0.012			
		(0.038)			
$BGPR_{bt-1}^{T(Act)}$		-0.045			
		(0.039)			
$BGPR_{bt}^{Tfin}$			-0.069		
			(0.066)		
$BGPR_{bt-1}^{Tfin}$			-0.148**		
			(0.067)		
$BGPR_{bt}^{Tfin(Threat)}$				-0.069	
				(0.067)	
$BGPR_{bt-1}^{Tfin(Threat)}$				-0.150**	
				(0.067)	
$BGPR_{bt}^{Tfin(Act)}$					-0.025
					(0.035)
$BGPR_{bt-1}^{Tfin(Act)}$					-0.035
					(0.033)
Bank Controls	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Observations	475	475	475	475	475
R^2	0.956	0.952	0.956	0.956	0.953

Note: This table reports results from bank-level regressions with log loan origination amount ($orig$) as the dependent variable using data from FR Y-14 for the sample period 2013:Q1 to 2022:Q4 based on Equation (10). The main regressors are subindices of $BGPR^T$, or bank-specific geopolitical risk index based on $CGPR^T$, which is constructed with earnings call transcripts using the NL Analytics platform and captures geopolitical risk perception by firms worldwide. $BGPR^{T(Threat)}$ captures firms' perceptions of geopolitical risk threats, and $BGPR^{T(Act)}$ captures their perceptions of geopolitical risk stemming from acts. $BGPR^{Tfin}$ captures financial firms' perceptions of geopolitical risk, with $BGPR^{Tfin(Threat)}$ and $BGPR^{Tfin(Act)}$ denoting its subcomponents for threats and acts, respectively. Bank controls include lagged Tier 1 capital ratio and liquid asset ratio. All the geopolitical risk indices are standardized by their respective standard deviations within the sample. Standard errors, shown in parentheses, are clustered at the bank and time level. *$p < .1$; **$p < .05$; ***$p < .01$.

Table A.7: Geopolitical Risk and Domestic Lending Standards, Threats vs. Acts

ls_{bt}	(1)	(2)	(3)	(4)
$\Delta \log(BGPR_{bt}^{T(Threat)})$	-0.036***			
	(0.012)			
$\Delta \log(BGPR_{bt-1}^{T(Threat)})$	-0.011			
	(0.010)			
$\Delta \log(BGPR_{bt}^{T(Act)})$		-0.002		
		(0.013)		
$\Delta \log(BGPR_{bt-1}^{T(Act)})$		0.011		
		(0.012)		
$\Delta \log(BGPR_{bt}^{T^{fin}(Threat)})$			-0.025**	
			(0.011)	
$\Delta \log(BGPR_{bt-1}^{T^{fin}(Threat)})$			-0.013	
			(0.011)	
$\Delta \log(BGPR_{bt}^{T^{fin}(Act)})$				-0.101
				(0.089)
$\Delta \log(BGPR_{bt-1}^{T^{fin}(Act)})$				0.056
				(0.065)
Bank FE	Yes	Yes	Yes	Yes
Macro Controls	Yes	Yes	Yes	Yes
Bank Controls	Yes	Yes	Yes	Yes
Observations	1466	1211	1430	144
R^2	0.353	0.369	0.347	0.450

Note: This table reports bank-level regression results based on Equation (12), where the dependent variable is banks' response to the SLOOS survey question on tightening, maintaining, or loosening credit standards for C&I loans to large and medium-sized firms, using a sample spanning from 1990:Q2 to 2022:Q2. Each column correspond to a subindex of $BGPR^T$ as the main regressor, where $BGPR^T$ is bank-specific geopolitical risk index based on $CGPR^T$, which is constructed with earnings call transcripts using the NL Analytics platform and captures geopolitical risk perception by firms worldwide. $BGPR^{T(Threat)}$ captures firms' perceptions of geopolitical risk threats, and $BGPR^{T(Act)}$ captures their perceptions of geopolitical risk stemming from acts. Similarly, $BGPR^{T^{fin}(Threat)}$ and $BGPR^{T^{fin}(Act)}$ represent the corresponding subcomponents for threats and acts, respectively, when the firm sample is restricted to financial firms. All specifications include bank fixed effects, macroeconomic controls, bank-level controls, and the lagged dependent variable. The geopolitical risk indices are standardized by their respective standard deviations within the sample. Standard errors, shown in parentheses, are clustered at the bank and time level. $^*p < .1$; $^{**}p < .05$; $^{***}p < .01$.

Table A.8: Geopolitical Risk and Lending Standards on Commercial Real Estate Loans

ls_{bt}	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta \log(BGPR^N_{bt})$	-0.002	0.000	-0.001			
	(0.017)	(0.017)	(0.017)			
$\Delta \log(BGPR^N_{bt-1})$	-0.045***	-0.040**	-0.040**			
	(0.017)	(0.016)	(0.016)			
$\Delta \log(BGPR^T_{bt})$				-0.026	-0.041*	-0.038*
				(0.020)	(0.021)	(0.020)
$\Delta \log(BGPR^T_{bt-1})$				-0.043**	-0.046***	-0.042**
				(0.017)	(0.017)	(0.017)
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Macro Controls	No	Yes	Yes	No	Yes	Yes
Bank Controls	No	No	Yes	No	No	Yes
Observations	1156	1156	1152	704	704	704
R^2	0.246	0.298	0.325	0.250	0.305	0.357

Note: This table reports bank-level regression results based on Equation (12), where the dependent variable is banks' response to the SLOOS survey question on tightening, maintaining, or loosening credit standards for commercial real estates loans. The main regressor $BGPR^N$ (Columns (1)–(3)) is the bank-specific geopolitical risk index constructed from $CGPR^N$, the country-specific geopolitical risk index from Caldara and Iacoviello (2022), using Equation (1). $BGPR^T$ (Columns (4)–(6)) is the bank-specific geopolitical risk index derived from $CGPR^T$, which captures firms' geopolitical risk perceptions based on earnings call transcripts processed through the NL Analytics platform. Columns (2) and (5) add macroeconomic controls, including (log) changes in the 2-year Treasury yield, the yield curve slope (10y–2y), the CBOE Volatility Index (VIX), the S&P 500 index, and U.S. industrial production. Columns (3) and (6) further control for loan demand, as well as banks' liquid asset and Tier 1 capital ratios. The geopolitical risk indices are standardized by their respective standard deviations within the sample. Standard errors, shown in parentheses, are clustered at the bank and time level. $^*p < .1$; $^{**}p < .05$; $^{***}p < .01$.

C Model: Proofs and Parameter Restrictions

C.1 Proofs

This section contains the proofs of the propositions stated in Section 4.

Proposition 1:

Proof. (1) Note that $\hat{\delta}^A$ is the solution to $\pi_2^{A,C} = \pi_2^L$ and $\hat{\delta}^X$ is the solution to $\pi_2^{X,C} = \pi_2^L$. Because $\pi_2^{X,C} < \pi_2^{A,C}$ and $\frac{\partial \pi_2^L}{\partial \delta} > 0$, $\hat{\delta}^A > \hat{\delta}^X$.

(2) Note that $\Delta\hat{\delta} = \hat{\delta^A} - \hat{\delta^X}$ increases with $\pi_2^{A,C} - \pi_2^{X,C}$. $\pi_2^{A,C} - \pi_2^{X,C} = (1-p)D_2^* i$, and

$$\frac{\partial(\pi_2^{A,C} - \pi_2^{X,C})}{\partial p} = -iD_2^* < 0. \tag{A.1}$$

Because $\pi_2^{A,C} - \pi_2^{X,C}$ decreases in p, $\Delta\hat{\delta}$ decreases in p.

(3)

$$\frac{\partial(\pi_2^{A,C} - \pi_2^{X,C})}{\partial D_2^*} = i(1-p) > 0. \tag{A.2}$$

Because $\pi_2^{A,C} - \pi_2^{X,C}$ increases in D_2^*, $\Delta\hat{\delta}$ increases in D_2^*. □

Proposition 2:

Proof. (1)

$$L_2^{G,C} = \frac{L^* + R_1 L_1 - D_1 i - \mu L^* \alpha(p^G)}{\mu} > L_2^{B,C} = \frac{L^* + R_1 L_1 - D_1 i - \mu L^* \alpha(p^G)}{\mu} \tag{A.3}$$

because $p^G > p^B$ and $\alpha(p^G) < \alpha(p^B)$.

(2)

$$L_2^L = \frac{\delta L^* + L_1 R_1 - D_1 i}{\mu} > L_2^{B,C} = \frac{L^* + R_1 L_1 - D_1 i - \mu L^* \alpha(p^G)}{\mu}. \tag{A.4}$$

Solving for δ delivers $\delta > (1 - \alpha(p)\mu)$.

(3)

$$L_1 = \frac{E_1 - \mu L^* \alpha(\phi, p^G, p^B)}{\mu} > L_2^{B,C} = \frac{L^* + R_1 L_1 - D_1 i - \mu L^* \alpha(p^G)}{\mu}. \tag{A.5}$$

Rearranging delivers:

$$\frac{(R_1 - 1)L_1 - (i-1)D_1}{\mu} < (\alpha(p^B) - \alpha(\phi, p^B, p^G))L^*. \tag{A.6}$$

Because $\alpha(p^G) - \alpha(\phi, p^B, p^G) < 0$ and $\frac{(R_1-1)L_1-(i-1)D_1}{\mu} > 0$, $L_2^{G,C} > L_1$. □

C.2 Parameter Restrictions

We outline the parameter assumptions needed for a model solution in which the bank optimally invests both domestically and internationally at $t = 0$, and, when geopolitical risk is high at $t = 1$, liquidates its cross-border investment but retains its affiliate lending.

Profits with liquidation at $t = 2$ are given by:

$$\pi_2^L = (\frac{R-i}{\mu} + i)\left((\frac{R-i}{\mu} + i)E_1 + ((\delta - i) - (R-i)\alpha(\phi, p^G, p^B))L^*\right) < \pi_2^D. \tag{A.7}$$

Second-period profits without liquidation under the cross-border mode are given by:

$$\pi_2^{X,C} = pR^*L^* + L_2^C R - D_2^C i. \tag{A.8}$$

Plugging in $L_2^C = \frac{E_2^C}{\mu} - L^*\alpha(p)$, $D_2^C = L_2^C - (L_1 R - D_1 i)$ and $E_2^C = E_1 + (R-1)L_1 + (1-i)D_1$, we obtain:

$$\pi_2^{X,C} = pR^*L^* + (R-i)L_1\left(\frac{R-i}{\mu} + i\right) + (R-i)L^*(\frac{1}{\mu}(1-i) - \alpha(p)) - L^*i^2 + \left(\frac{R-i}{\mu} + i\right)E_1 i. \tag{A.9}$$

Second-period profits without liquidation under the affiliate mode are given by:

$$\pi_2^{A,C} = pR^*L^* + (R-i)L_1\left(\frac{R-i}{\mu} + i\right) + (R-i)L^*(\frac{1}{\mu}(1-i) - \alpha(p)) - L^*i^2 + \left(\frac{R-i}{\mu} + i\right)E_1 i + (1-p)D_2^* i. \tag{A.10}$$

By setting $\pi_2^{X,C} = \pi_2^L$ and $\pi_2^{A,C} = \pi_2^L$, we can get $\delta^{\hat{X}}$ and $\delta^{\hat{A}}$.

$$\delta^{\hat{X}} = \frac{-R\alpha\mu + R + R^*\mu p + i\alpha(p)\mu - i}{R + i\mu - i}. \tag{A.11}$$

From $\pi_2^{A,C} = \pi_2^L$, we obtain:

$$\delta^{\hat{A}} = \frac{-R\alpha\mu + R + R^*\mu p + i\alpha(p)\mu - i + (1-p)\frac{\mu}{L^*}D_2^* i}{R + i\mu - i}. \tag{A.12}$$

Assume that $\min\{\delta^{\hat{A},B}, \delta^{\hat{X},G}, 1\} > \delta > \delta^{\hat{X},B}$. Then the bank does not liquidate the foreign investment in the good state of the world, while the bank liquidates the foreign investment under the cross-border mode in the bad state of the world but not under the affiliate mode.

At $t = 0$ banks chose the investment that maximizes their expected (second-period) profits. The domestic asset invested for two periods, delivers the following profits:

$$\pi^D = \left(\frac{R-i}{\mu} + i\right)^2 E_1 \tag{A.13}$$

Assuming $\delta^{\hat{A},B} > \delta > \delta^{\hat{X},B}$ and $\delta^{\hat{A},G} > \delta^{\hat{X},G} > \delta$, expected profits under cross-border

investment are:

$$\pi^X = (1-\phi)\pi_2^{X,C,G} + \phi\pi_2^L. \tag{A.14}$$

And profits with a foreign affiliates are:

$$\pi^A = (1-\phi)\pi_2^{A,C,G} + \phi\pi_2^{A,C,B} - \kappa. \tag{A.15}$$

Since $\pi^L < \pi^D$ even for $\delta = 1$, $\pi^D < \pi^X$ implies $\pi_2^{X,C,G} > \pi^L$, hence $\delta^{\hat{X},G} > 1$. In other words, if investing both at home and abroad yields a higher expected return than investing solely in the domestic asset, and given that $\delta < 1$, the cross-border investment is never liquidated in the good state. Furthermore, since $\delta^{\hat{X},G} < \delta^{\hat{A},G}$, the same holds for the affiliate mode in the good state.

In addition to the assumptions on δ, we therefore require parameters such that $\pi^D < \pi^X$, meaning that $\pi_2^{X,C,G}$ needs to be sufficiently high, since $\pi_2^{X,C,B} < \pi_2^L$ follows from the assumption on δ. This condition can be achieved by setting $(1-\phi)p^G R^*$—the expected return in the good state of the world —sufficiently high. If $\kappa = 0$, we know that $\pi^A > \pi^X$. Hence, we additionally require κ to be sufficiently small to satisfy $\pi^D < \pi^A$.