Geopolitical Risk and Global Banking *

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Abstract

This paper shows that geopolitical risk significantly affects the operations of internationally active banks, transmitting risk to countries not directly involved in conflicts. Using multiple supervisory datasets and newly-constructed geopolitical risk indices, we document that (i) geopolitical risk increases the credit risk of internationally active banks; (ii) these banks nonetheless continue to lend to countries experiencing heightened geopolitical risk through their branches and subsidiaries, while reducing cross-border lending to these countries; and (iii) they do not adjust foreign exposure in similar ways in response to other types of risk. These results suggest that banks face trade-offs and frictions that prevent prompt divestiture of foreign assets in response to geopolitical risk. We show that these forces generate significant spillover effects: global banks reduce C&I lending and tighten lending standards to domestic firms in response to rising geopolitical risk abroad. The degree of spillovers is greater when the risk stems from countries where banks have affiliates or from more geopolitically aligned countries.

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

JEL-Codes: F34, F36, G21

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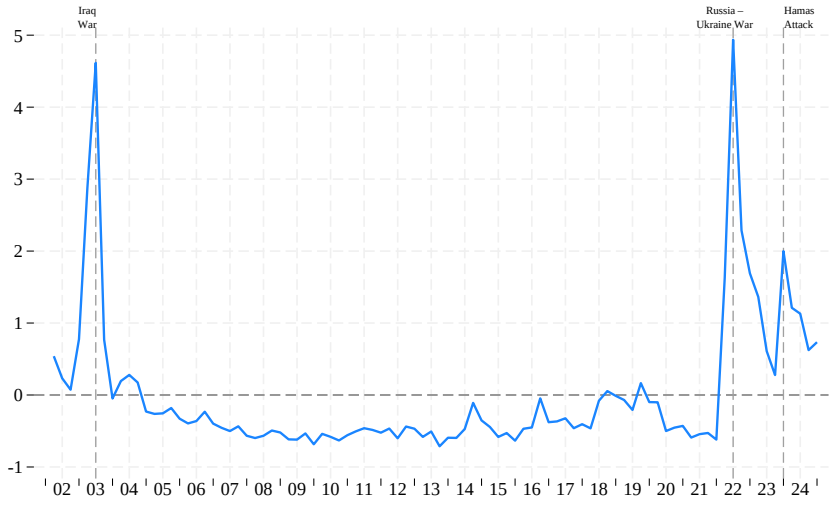
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1 Introduction

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 ongoing conflicts in the Middle East. Figure 1 illustrates the sharp increases in geopolitical risk using the global 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



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 is still nascent. In particular, the financial and international mechanisms through which geopolitical risk affects economies are not well understood. This paper aims to address this gap by analyzing how global banks navigate rising geopolitical risk. Operating across numerous countries, these banks are inherently exposed to geopolitical risks

[1]The topic of geopolitical risk has frequently been raised in central banks' key policy meetings and speeches since 2019. See Federal Reserve's FOMC meeting minutes and the speech by Christine Lagarde on "Central banks in a fragmenting world" from April 17, 2023, as examples. 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."

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 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 impacted by and respond to geopolitical risk. Using both existing and newly constructed bank-specific and country-specific geopolitical risk indices, along with multiple confidential supervisory datasets on U.S. bank lending spanning nearly four decades, we document that as geopolitical risk rises in countries where these banks operate, their credit risk increases. While banks respond by reducing exposure to these countries, this contraction occurs primarily through reduced cross-border lending extended directly from the United States.[2] In contrast, banks do not significantly reduce their local lending extended by their branches and subsidiaries abroad. This behavior likely reflects the significant costs and frictions associated with divesting their local operations, making it more favorable to bear the increasing risk.

In addition to the adjustments (or lack thereof) in their foreign operations in response to rising geopolitical risk, we further show that U.S. banks reduce lending to domestic firms. This finding indicates that foreign geopolitical risk spills over into the U.S. economy through the activities of globally active U.S. banks. Notably, the extent of these spillovers is greater when the risk stems from countries where banks have affiliates. Moreover, we find little evidence that banks respond similarly to other types of risk, underscoring the distinctive nature and impact of geopolitical risk.

We begin the analysis by compiling and constructing country-specific and bank-specific geopolitical risk indices. 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 country-specific geopolitical risk 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).

[2]Banks can extend credit to foreign borrowers through two modes: 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 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 country-specific geopolitical risk (CGPR) indices, we construct bank-specific geopolitical risk (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 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 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 two 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 expressing intention to exit the market soon after the invasion. These banks cite difficulty in finding suitable buyers and high costs of writing off investments as some of the reasons for the protracted exit.[3]

Banks' behavior in response to geopolitical risk appears distinct from their reactions to other types of risks. We examine how banks adjust their cross-border and local exposures in response to increases in broad country risk, using measures commonly employed in the literature, including the country risk index by Hassan et al. (2023), 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. Our findings show that banks do not reduce their cross-border or local exposures when broad country or sovereign risk increases, underscoring the unique nature of their responses to geopolitical risk.

We next turn to the effects of geopolitical risk on U.S. banks' domestic credit supply. To comply with regulatory capital ratio requirements, banks must reduce lending when credit risk increases to lower risk-weighted assets, which form the denominator of the regulatory

[3]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.

capital ratio.[4] As a result, when banks continue to lend to foreign countries experiencing heightened geopolitical risk, they may be compelled to scale back domestic lending to satisfy regulatory capital requirements.

To test this hypothesis, 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. The loan-level results show that U.S. banks originate fewer loans to domestic firms in response to an increase in BGPR. Furthermore, we find that the effect is primarily driven by changes in perceived threats of geopolitical risk rather than the realization of specific geopolitical events, highlighting the significance of uncertainty in generating the spillover effects of geopolitical risk through banks. The results are consistent at the bank level.

We further test and validate the role of banks' foreign exposure—through cross-border versus local claims—in driving the spillover effects on domestic loan origination, building on our finding that banks reduce cross-border claims but not local claims as geopolitical risk rises. To this end, 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, aligning with the earlier finding on the persistence of local claims. In addition, we explore the role of banks' capital positions and countries' geopolitical alignments in driving the spillover effects. Consistent with the proposed transmission mechanism through banks' regulatory capital constraints, we find that banks with stronger capital positions reduce domestic loan origination less in response to increasing geopolitical risk abroad. Furthermore, geopolitical risk originating from countries more closely aligned with the United States, as measured by military alliance and UN voting records, generates stronger spillover effects.

In addition to the loan origination analysis, which is limited by data coverage to less than

[4]While banks could raise additional capital, capital tends to be fixed in the short run as Adrian and Shin (2014) show.

15 years, 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 from the 1980s onward. This survey captures banks' self-reported changes in credit standards—tightening or loosening—as well as shifts in credit demand over a three-month period. Our analysis reveals that an increase in BGPR leads to a significant tightening of banks' lending standards for domestic C&I loans, confirming that foreign geopolitical risk impacts U.S. credit supply. Also, consistent with earlier findings, the results are primarily driven by banks' exposures to geopolitical risk through their 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 a reduced 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).

Our paper is related to the emerging literature on the role of geopolitical power and risk in affecting economic activities, prompted in part by recent geopolitical events including the trade war between the United States and China and Russia's invasion of Ukraine. Many of the papers in this literature focus on the impacts of these events, in particular the U.S.-China trade war, on the global supply chain (see, e.g., Amiti et al., 2020, Fajgelbaum et al., 2020, Fajgelbaum et al., 2021, and Alfaro and Chor, 2023). Clayton et al. (2023) provide a model for understanding the role of geopolitical power and economic coercion in influencing global real and financial activity. Caldara and Iacoviello (2022) show that rising geopolitical risk lowers domestic investment and employment.[5] We contribute to this literature by pointing out a new financial channel through which geopolitical risk is transmitted to the real economy. In particular, our paper delves into the global context and highlights how global geopolitical

[5]Wang et al. (2019) show that geopolitical risk affects firm corporate investment at the micro level.

risks propagate across borders and affect the real economy through global banks, due to their operational structure. To that end, our paper also contributes to the literature on risk and capital flow (see, e.g., Rey, 2016, Kalemli-Özcan, 2019, Jiang et al., 2020, Akinci et al., 2022, and Hassan et al., 2023) and the role of financial intermediaries in international spillovers (see, e.g., Peek and Rosengren, 2000, Schnabl, 2012, Ivashina et al., 2015, Hale et al., 2020, and Shen and Zhang, 2024).

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.[6] The FFIEC 009 reporters consist of U.S. banks, bank holding companies (BHCs), and intermediate holding companies 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.[7]

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

[7] 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 in 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 illustrate this by providing more granular snapshots of the geographical distribution of foreign claims for selected banks, displaying the top 5 countries of exposure as of 2010:Q4 and 2019:Q4, using the public version of the FFIEC 009/009a data.[8] These banks vary not only in the countries where they have significant exposure but also in the magnitude of their exposure. Furthermore, both the origins and magnitudes of exposure change over time within each bank.

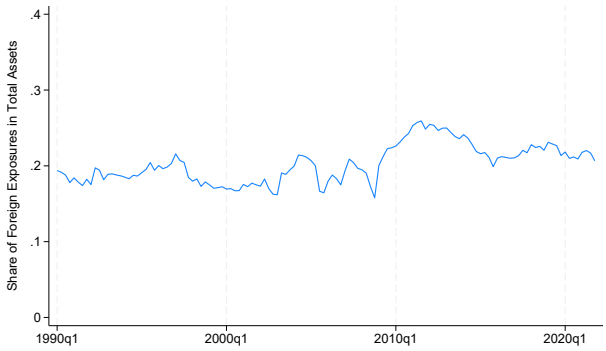
Overall, Figure 2 demonstrates that U.S. banks have substantial exposure to a diverse range of countries worldwide, with a significant portion of this exposure stemming from their operations within these countries. These foreign operations expose them to geopolitical risks globally. Moreover, since the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

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.

[8]The public version of the FFIEC 009/009a data provides information on material foreign country exposures (all exposures to a country in excess of 1 percent of total assets or 20 percent of capital, whichever is less) of U.S. banks that file the FFIEC 009 report. The reporting institutions must also furnish a list of countries in which they have lending exposures above 0.75 percent of total assets or 15 percent of total capital, whichever is less.

Figure 2: U.S. Banks' Foreign Operations

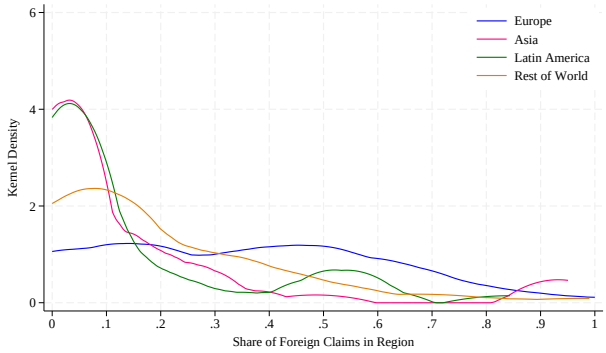
(a) Foreign Exposures as a Share of Total Assets



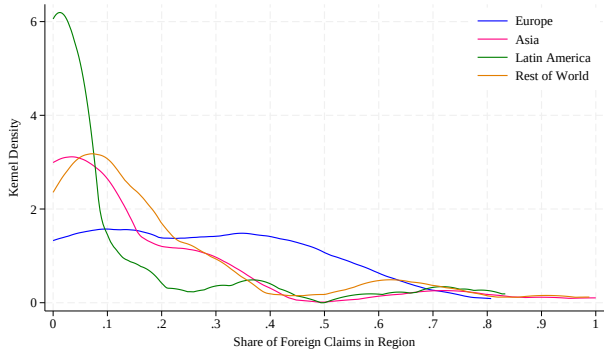
(b) Local Exposures as a Share of Foreign Exposures



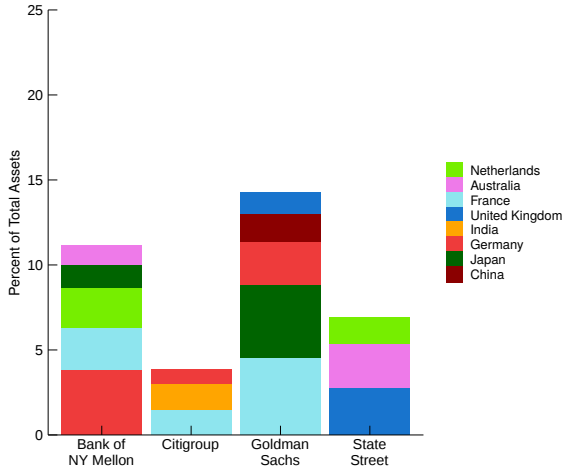
(c) Distribution of Foreign Exposure by Region, 2010:Q4



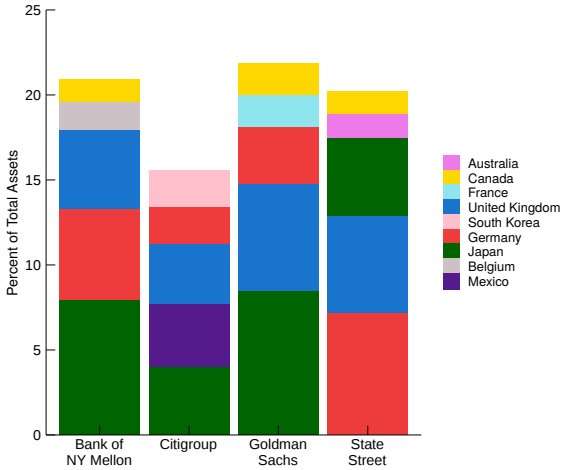
(d) Distribution of Foreign Exposure by Region, 2019:Q4



(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).

exposure are incorporated into the bank-specific measures of geopolitical risk we subsequently construct and play a key role in our identification strategy for 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. 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).[9]

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. We use the authors' recent CGPR indices, which are based on ten newspapers and begin in 1985, rather than the

[9]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.

historical series, which are based on three newspapers and available from 1900 onward. 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 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 comprised of their 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 closer alignment with $CGPR^N$. Appendix Table A.1 lists the search query for geopolitical risk, which are organized into eight categories. As in 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 ($CGPR^{T(Threat)}_{ct}$) and from acts ($CGPR^{T(Act)}_{ct}$). We also construct a sub-index specifically focused on the geopolitical risk perceived by financial firms ($CGPR^{Tfin}_{ct}$).

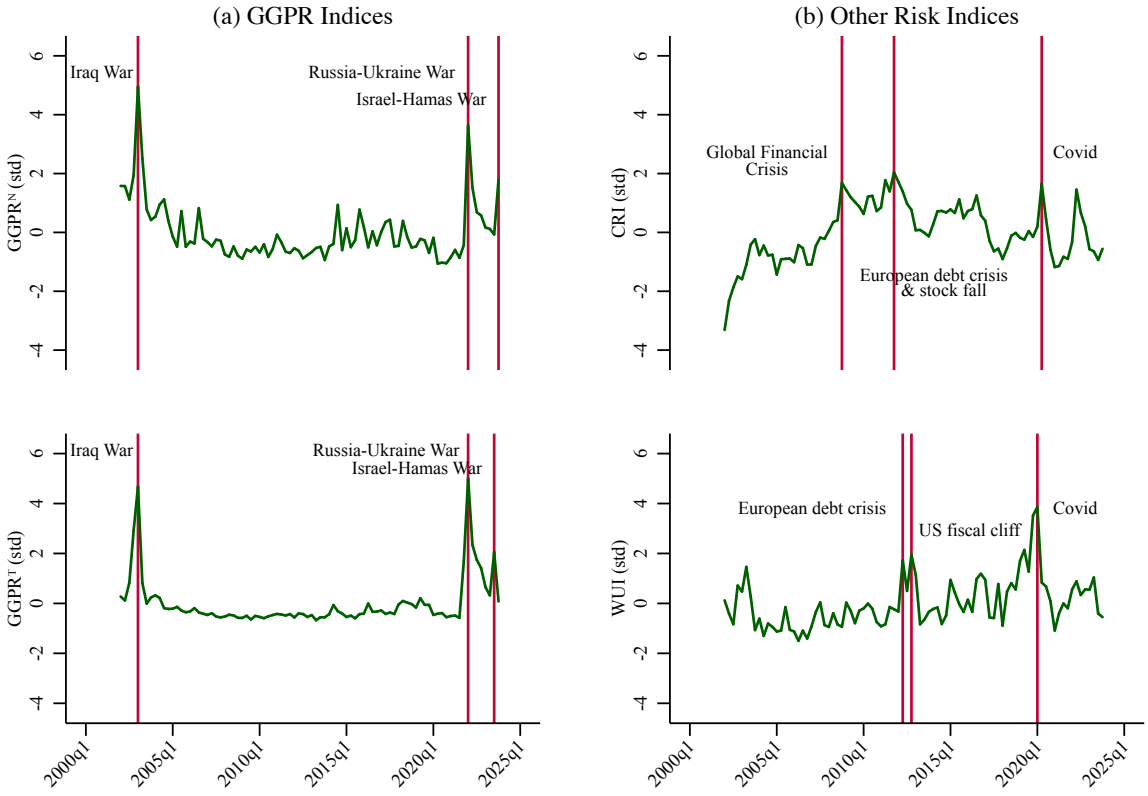
We construct BGPR indices using both $CGPR^N$ and $CGPR^T$. Indices based on $CGPR^N$ serve as our baseline measure of geopolitical risk due to their longer sample period starting in 1985. Indices based on $CGPR^T$ are used to assess the robustness of our results and to further explore how the components 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 2022: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 of 2022 for Poland, a series of terrorist incidents in London in 2005 and 2007 for the United Kingdom, and periods of heightened geopolitical tension 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 during Russia-Ukraine War). In contrast, the broad risk indices for these countries primarily spike during major economic crises, many of which are global. These contrasts further confirm 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 $CGPR^T$, producing $BGPR^N$ 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 in these operations. 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 draw on the quarterly loan-level data from FR Y-14 reports. These reports are filed confidentially by all BHCs participating in official Federal Reserve bank stress tests since late 2012. The participating institutions report detailed information about individual loans exceeding $1 million, including the name, country, and industry of the borrower, the loan amount, the origination date, and the probability of default assigned by the bank to the borrower.[10] The probability of default information allows us to study how geopolitical risk affects U.S. banks' assessment of the credit risk of the exposed loans, while the loan origination data enables us to analyze the transmission of geopolitical risk to domestic lending.

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'

[10]Of note, this data includes loans extended through banks' foreign offices, including foreign subsidiaries. Unfortunately, we cannot distinguish which loans are held by the parent bank and which loans are held by the foreign subsidiaries. As a result, we cannot split loan exposures into cross-border and local exposures in this dataset.

lending standards. In the quarterly SLOOS, 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. As typically done in the literature, we transform responses to into three outcomes: 1 = tightening, 0 = unchanged, and -1 = loosening. To map the SLOOS reporters to the corresponding FFIEC 009 reporters, we determine whether a SLOOS-reporting entity is a subsidiary of a BHC that reports the FFIEC 009. If it is, we average the responses of all loan officers within that BHC.

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 and balance sheets of all U.S. banks. Using these data, we construct a set of bank-level control variables for use in our regressions, including capital ratio and liquidity ratio.[11]

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.

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

[11]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.

(iii) banks do not adjust their foreign exposure in similar ways 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 FR Y-14 data, we calculate the average probability of default (PD) of loans to country c on the balance sheet of 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 changes driven by banks shifting toward originating safer loans, we exclude loans originated in quarter t.

Equipped with the weighed probabilities of default variable, we study the relationship between the CGPR indices and credit risk at the bank-country-time level using the specification:

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

where PD_{bct} denotes the weighted average probability of default assigned by bank b on loans to 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 and time level.

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 for these loans by 8 to 10 percent. These results support the conjecture that banks perceive higher credit risk in loans to borrowers

Table 1: Geopolitical Risk and Credit Risk

	Bank-country Level		Bank Level	
$PD_{bct/bt}$	(1)	(2)	(3)	(4)
$CGPR^N_{ct}$	0.100**			
	(0.040)			
$CGPR^T_{ct}$		0.076**		
		(0.032)		
$BGPR^N_{bt}$			0.204***	
			(0.042)	
$BGPR^T_{bt}$				0.118***
				(0.024)
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	400	400
R^2	0.680	0.679	0.878	0.876

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 bank-specific geopolitical risk index 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). $^*p < .1$; $^{**}p < .05$; $^{***}p < .01$.

from countries experiencing increasing 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. We examine how these two specific adverse geopolitical shocks affected the credit risk of U.S. banks' outstanding exposures to Russia relative to other countries.

Specifically, we ran the regression:

$$log(PD_{bct}) = \sum_{k \geq -m} \delta_{0k} D^k_{bct} + \sum_{k \geq -m} \delta_{1k} D^k_{bct} \times R_{bc} + \theta_{bc} + \gamma_{ct} + \epsilon_{bct}, \tag{3}$$

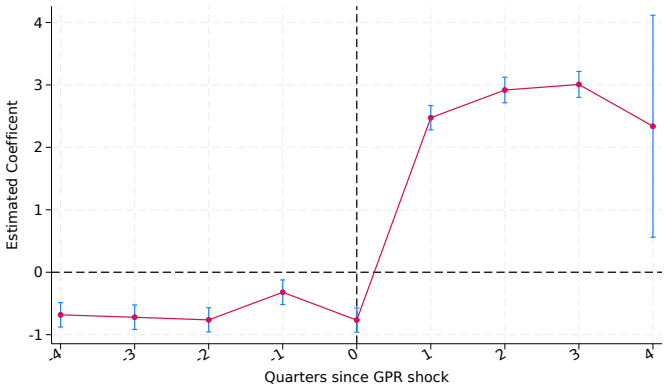
where PD_{bct} denotes the average probability of default of loans of bank b in country c at time t, D^k_{bct} denotes dummy variables that take the value 1 if the geopolitical risk shock occurred k quarters following the event and 0 otherwise, R_{bc} denotes dummy variables that take the value 1 if the borrower country is Russia and 0 otherwise, θ_{bc} denotes bank-country dummies, and γ_{ct} denotes country-time dummies.[12] 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

[12] We also ran the regression with R_{bc} 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.

borrowers from countries facing escalating geopolitical risk.

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 for loans to Russia relative to loans to other countries. It plots the coefficients δ_{1k} from Equation (3). Standard errors, shown in parentheses, are clustered at the country and time level. Data source(s): FR Y-14.

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 affect banks' aggregate loan portfolios materially. To address this, we assess whether an increase in the BGPR indices predicts a rise in the probability of default of U.S. banks' aggregate 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:

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

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

Columns (3)–(4) of Table 1 reports the results. An increase in BGPR, as measured by either $BGPR^N$ or $BGPR^T$, significantly increases the aggregate probabilities of default of bank loans. A one-standard-deviation increase in BGPR raises the weighted probability of

default in a bank's C&I loan portfolio by an average of 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 Credit Reallocation across Countries

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:

$$\log(exp_{bct}) = \beta_1 CGPR_{ct} + \beta_2 CGPR_{ct-1} + \beta_2 X_{ct-1} + \alpha_{bt} + \alpha_{bc} + \epsilon_{bct}. \tag{5}$$

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 $CGPR$.[13] X_c captures country-level 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, its log sovereign CDS spread, 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

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

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 results show that while banks reduce their total exposure to countries experiencing increasing geopolitical risk, their reallocation behavior differs notably based on the mode of operation in the affected country. While banks reduce cross-border exposures to countries facing escalating geopolitical risk, their operations through local offices in those countries remain essentially unchanged.[14] 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). The results are quantitatively and qualitatively similar with $CGPR^T$ as the main regressor, as shown in Appendix Table A.1.

In sum, our results show that banks only reduce cross-border exposures to countries experiencing heightened geopolitical risk. Despite the increasing credit risk, they continue to hold existing loans in their local operations in these countries.

3.3 Geopolitical Risk and Other Risks

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

Table 3 reports the results. Columns (1)–(2), (3)–(4), and (5)–(6) present the results from regressions using CRI, WUI, and CDS spreads as the regressors, respectively. The odd-numbered columns use log cross-border claims as the dependent variable, while the even-numbered columns use log local claims. The coefficients on the alternative risk indices are generally small and not statistically significant across all specifications. In other words,

[14] Results become even stronger when earlier years are dropped from the sample. The negative effect of geopolitical risk on cross-border claims is greater in magnitude and more statistically significant after 1999, driven by stronger effects on claims on emerging markets.

Table 2: Geopolitical Risk and Foreign Credit Reallocation

	Total		Cross-border		Local	
exp_{bct}	(1)	(2)	(3)	(4)	(5)	(6)
$CGPR^N_{ct}$	-0.018**	-0.026***	-0.026***	-0.036***	0.011	-0.016
	(0.007)	(0.009)	(0.008)	(0.010)	(0.015)	(0.015)
$CGPR^N_{ct-1}$	-0.010	-0.013	-0.014*	-0.023**	0.012	0.003
	(0.008)	(0.010)	(0.009)	(0.011)	(0.014)	(0.015)
$\mathbf{1}(Sanction)_t$	0.046***	-0.128***	0.035**	-0.172***	-0.009	-0.227***
	(0.016)	(0.027)	(0.017)	(0.031)	(0.027)	(0.049)
$ln(Exch.Rate)_{t-1}$		-0.149***		-0.123***		0.046
		(0.041)		(0.044)		(0.051)
$ln(StockIndex)_{t-1}$		0.102***		0.164***		-0.108**
		(0.026)		(0.027)		(0.052)
$ln(CDS)_{t-1}$		-0.010		-0.001		-0.095***
		(0.016)		(0.017)		(0.027)
Bank-country FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	137312	40295	135803	39449	34801	13691
R^2	0.894	0.944	0.875	0.932	0.878	0.929

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 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, log sovereign CDS spread, 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 3: Other Risks and Foreign Credit Reallocation

	(1)	(2)	(3)	(4)	(5)	(6)
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. $^*p < .1$; $^{**}p < .05$; $^{***}p < .01$.

banks do not make notable adjustments in either cross-border or local claims in response to changes in these alternative risk measures.

These results suggest that banks respond to geopolitical risk differently than to other types of risk, indicating that geopolitical risk represents a distinct type of risk. One possible explanation is that, while banks are equipped to manage general types of risk, geopolitical risk often involves adverse developments in the rule of law and introduces extraordinary uncertainty, making it more difficult for banks to predict and mitigate. In the subsequent section, we explore the role of uncertainty in affecting banks' response to geopolitical risk.

3.4 Discussion

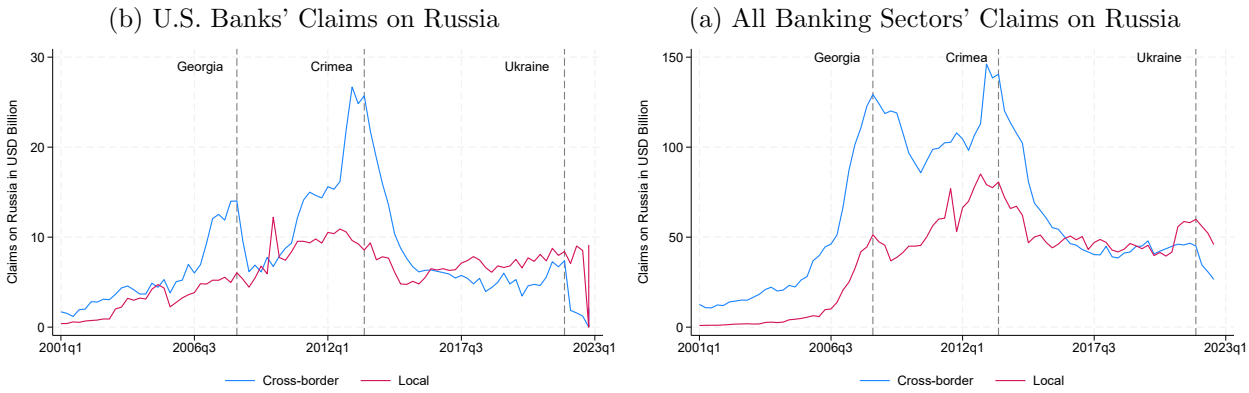
Summarizing all three sets of results, we found that geopolitical risk significantly increases the credit risk for U.S. banks with foreign operations. However, these banks continue to lend to countries experiencing heightened geopolitical risk through their branches and subsidiaries while reducing cross-border claims. In contrast, U.S. banks do not adjust their foreign exposure in the same way in response to other types of risk. The fact that banks continue to hold existing loans in local operations despite increasing credit risk suggests the presence of frictions that limit their ability to quickly divest assets from these operations.

In the following, we provide context for these frictions by exploring how geopolitical conflicts involving Russia affected foreign claims on Russia and potential challenges banks face in reducing their local operations there.

First, in light of the preceding cross-country evidence related to banks' mode of foreign operations, we examine the evolution of cross-border and local claims on Russia in the aftermath of its conflict with Georgia in 2008:Q3, its annexation of Crimea in 2013:Q4, and its invasion of Ukraine in 2022:Q1. Panel (a) of Figure 5 illustrates the claims by the U.S. banking sector on Russia, and Panel (b) illustrates those for all BIS-reporting banking sectors. Evidently, while both local and cross-border claims on Russia fell after the adverse geopolitical shocks, local exposures fell significantly less in percentage terms than cross-border exposures.

Next, we examine anecdotal evidence that may help explain the differences in the response of local and cross-border claims to geopolitical shocks. At the time of Russia's invasion of Ukraine in February 2022, several large global banks were running significant operations in Russia, including operations through their Russian subsidiaries. UniCredit, Societe Generale, Citigroup, and RBI were among the banks with the largest exposures. The extent to which they have divested from Russia since the invasion varies considerably. Societe Generale, which earned approximately 3 percent of its net income in Russia prior to the war, was the first bank that successfully sold its Russian subsidiary. In April 2022, it sold Rosbank to a business group linked to a Russian oligarch, incurring a $3.3 billion dollar loss from the sale. By acting quickly, the oligarch in question had not been sanctioned yet by the EU, allowing

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.

for the sale.

In contrast, the other global banks have divested much more slowly. 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 is winding down its subsidiary by letting business run off and selling portfolios. UniCredit and RBI, on the other hand, continue to operate their Russian subsidiaries despite increasing pressure from the ECB to terminate their operations in Russia. Most recently, UniCredit took legal action following a letter from the ECB requesting that UniCredit and other banks still operating in Russia present a plan to reduce their Russian exposures. In response, RBI paused brokerage account openings at its Russian subsidiary. Reportedly, the banks are still looking for opportunities to sell their Russian subsidiaries; however, any sale needs to be approved by the Russian President at this point and could come at a hefty cost.[15] RBI, which runs the 10th largest bank in Russia, would be particularly impacted by an unfavorable sale. The bank earns around 40 percent of its group revenue in Russia and estimates that walking away from its subsidiary would result in a 2.5 percentage point hit to its CET1 capital, which is substantial.[16]

[15]British bank HSBC managed to get approval to sell its small Russian subsidiary to Russian Expobank for an undisclosed amount, completing the sale in mid-2024. Italian bank Intesa has also received approval to offload its Russian assets but is still in the process of finalizing the transaction.

[16]For a summary article on global banks' operations in Russia since the Russia-Ukraine War, see "European

The frictions Western banks currently face in selling their Russian subsidiaries are arguably extreme, but their case highlights the difficult tradeoffs involved. When banks operate branches and subsidiaries in foreign countries, these operations are largely funded locally, often in the local currency, and this funding is difficult to redeploy elsewhere. In contrast, cross-border loans are funded by the parent bank, making it easier to redirect funds to other countries. Additionally, operating a local banking business carries significant franchise value. Allowing the business to wind down destroys this value, while selling during periods of heightened geopolitical risk often necessitates accepting steep discounts, as illustrated by Societe Generale's experience. The larger a foreign subsidiary is relative to a bank's other operations and the more critical its revenues are to the bank, the harder it becomes to absorb the losses from a sale, as these losses are substantial compared to the bank's overall revenue streams. Faced with these challenges, banks may choose to wait out the risk rather than sell or halt operations.

4 Transmission of Geopolitical Risk to Domestic Credit

Given that U.S. banks do not reduce local claims to countries experiencing heightened geopolitical risk despite increasing credit risk, geopolitical risk may propagate to their domestic operations as a result. We proceed to study whether U.S. banks play a role in transmitting foreign geopolitical risk to domestic credit supply. We begin by outlining a conceptual framework to clarify the transmission mechanism. We then examine the effects of U.S. banks' exposure to foreign geopolitical risk, as measured by the BGPR indices, on their loan origination to U.S. firms. Finally, we analyze how this exposure influences their lending standards for domestic loans.

banks still in Russia: should they stay or should they go?" March 17, 2023, The Banker. Related information can be found in media reports such as the ones listed in Footnote 3, 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 10-K filing with the U.S. Securities and Exchange Commission from 2022.

4.1 Conceptual Background

U.S. banks are subject to capital regulation that requires them to hold a minimum amount of capital against risk-weighted assets:

$$\frac{\text{Equity capital}}{\text{Domestic Lending} \times \text{Domestic Risk} + \text{Foreign Lending} \times \text{Foreign Risk}} \geq \mu + \text{buffer}, \quad (6)$$

where μ represents a bank's regulatory minimum capital ratio requirement, and banks often hold a fixed buffer above this requirement. Previous studies such as Adrian and Shin (2014) have shown that bank equity capital is fixed in the short run. Consequently, when the risk in a portion of a bank's portfolio increases, the bank must reduce lending, de-risk, or both to maintain its regulatory capital ratio at the desired level.

When geopolitical risk increases in countries where a bank has lending relationships, the risk associated with its foreign lending rises, increasing the denominator in Equation (6).[17] To continue to satisfy the constraint, the bank may de-risk and reduce foreign and/or domestic lending in response. As previously discussed, banks face challenging tradeoffs when divesting local operations during periods of substantial risk. In fact, as we have shown, U.S. banks do not reduce local foreign claims in response to geopolitical risk, despite increasing credit risk.

Given the regulatory constraint and our empirical observation, we conjecture that these banks may instead reduce domestic lending in response to increasing geopolitical risk abroad. This 'spillover effect' of foreign geopolitical risk on U.S. lending forms the basis of our analysis of the impact of foreign geopolitical risk on U.S. domestic lending. Equation (6) predicts that the greater the increase in foreign risk and the larger a bank's foreign operations, the more the bank must reduce domestic lending and de-risk. Furthermore, the less the bank reduces foreign lending in response to a given rise in foreign GPR, the more it must shrink domestic lending, thereby amplifying spillover effects.

When a bank reduces its exposure to geopolitical risk abroad by selling assets, its capital

[17] In practice, material foreign branches and subsidiaries are consolidated with the parent bank's balance sheet for capital regulation purposes. Thus, an increase in credit risk in the foreign affiliate leads to an increase in risk-weighted assets for the parent bank. For U.S. banks, this may also result in higher projected losses under regulatory stress tests, further increasing the parent bank's capital requirements.

ratio could also decline, potentially leading to a reduction in domestic lending. The sale of a foreign entity reduces equity capital because the portion contributed by the foreign operations is removed from total equity. Additionally, the bank may realize gains or losses from the sale, further affecting equity capital. At the same time, the denominator of the capital ratio decreases due to the reduction in foreign risk-weighted assets. The net effect on the capital ratio depends on the relative magnitudes of these changes. If the foreign entity is sold at a significant loss and is large relative to the bank's other operations, the capital ratio will decline, necessitating a reduction in domestic lending or risk. Thus, spillover effects on domestic lending can also arise when banks engage in (costly) de-risking through asset sales.

4.2 Geopolitical Risk and Domestic Loan Origination

To test the spillover effects, we first analyze the effect of foreign geopolitical risk on U.S. banks' corporate loan origination to domestic firms, using FR Y-14 data for the period 2013:Q1 to 2022:Q4 and the BGPR indices. We begin the analysis at the loan level, which enables us to control for potential demand-side responses by firms and isolate the supply effect. Next, we analyze the bank-level data to investigate whether this effect is substantial enough to be observed in aggregate.

We apply the following specification to study the relationship between BGPR and domestic loan origination for U.S. banks:

$$log(orig_{bit}) = \beta BGPR_{bt} + \delta Z_{bt} + \delta X_{bit} + \gamma_{it} + \alpha_b + \epsilon_{bit}, \tag{7}$$

where $orig_{bit}$ denotes the amount of loan origination by bank b to domestic firm i at time t, $BGPR_{bt}$ denotes $BGPR_{bt}^{N}$ or $BGPR_{bt}^{T}$, 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 ed a greater increase in geopolitical risk through their foreign exposures, as captured by the BGPR indices, adjusted their supply of loan origination to domestic firms, conditioning

on the specified controls and fixed effects. As described in Section 2, the BGPR indices contains considerable variation, both in the 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.

Table 4 reports the results. Panel (a) presents the results using $BGPR^N$ as the main regressor. Column (1) controls for bank, time, and firm fixed effects separately; column (2) uses firm-time fixed effects; and column (3) additionally includes bank- and loan-level controls. The results show that U.S. banks significantly reduce loan origination to domestic firms in response to an increase in BGPR. The coefficient on $BGPR^N$ remains stable when firm-time fixed effects is included in column (2), indicating that changes in credit demand are not a significant confounding factor. Based on the coefficient in column (3) which includes the full set of fixed effects and controls, a one-standard-deviation increase in $BGPR^N$ reduces U.S. banks' loan origination to U.S. firms by 9 percent.

Column (1) of Panel (b) presents the results using $BGPR^T$ as the main regressor. The coefficient on $BGPR^T$ is negative, significant, and of similar magnitude as that on $BGPR^N$ from Panel (a), further confirming that banks play a significant role in transmitting foreign geopolitical risk to domestic credit supply.

The remaining columns of Panel (b) present the results using the five subindices of $BGPR^T$ as regressors. As described in Section 2, $BGPR^{T(Threat)}$ 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 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. The results show that the effect of BGPR on loan origination is primarily driven by perceived threats of geopolitical risk (columns 2 and 5), rather than realization of specific events (columns 3 and 6). This highlights the significance of uncertainty in generating the spillover effects of geopolitical

Table 4: Geopolitical Risk and U.S. Domestic Loan Origination, Loan Level

(a) $BGPR^N$

$orig_{bit}$	(1)	(2)	(3)
$BGPR^N_{bt}$	-0.069***	-0.060**	-0.089***
	(0.020)	(0.026)	(0.027)
Bank FE	Yes	Yes	Yes
Time FE	Yes	No	No
Firm FE	Yes	No	No
Firm-time FE	No	Yes	Yes
Bank Controls	No	No	Yes
Loan Controls	No	No	Yes
Observations	317608	205642	171380
R^2	0.594	0.594	0.615

(b) $BGPR^T$

$orig_{bit}$	(1)	(2)	(3)	(4)	(5)	(6)
$BGPR^T_{bt}$	-0.079***					
	(0.021)					
$BGPR^{T(Threat)}_{bt}$		-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	Yes	No	Yes
Loan Controls	Yes	Yes	Yes	Yes	No	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	171380	171380	171380	171380	171380	171380
R^2	0.615	0.615	0.615	0.615	0.615	0.615

Note: This table reports results from loan-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 7. Panel (a) reports results using $BGPR^N$ as the main regressor, which denotes the bank-specific geopolitical risk index based on $CGPR^N$ or the (recent) country-specific geopolitical risk index from Caldara and Iacoviello (2022). Panel (b) reports results using $BGPR^T$ and its subindices as the main regressors. $BGPR^T$ denotes bank-specific geopolitical risk index based on $CGPR^T$, or which is constructed with earnings call transcripts using the NL Analytics platform and captures the perception of geopolitical risk by firms worldwide. $BGPR^{T(Threat)}$ captures firms' perceptions of the threats of geopolitical risk, and $BGPR^{T(Act)}$ captures their perceptions of geopolitical risk due to its realization. $BGPR^{T^{fin}}$ captures the perception of geopolitical risk by financial firms, and $BGPR^{T^{fin}(Threat)}$ and $BGPR^{T^{fin}(Act)}$ denote its subcomponents for threats and realizations, 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. *$p < .1$; **$p < .05$; ***$p < .01$.

risk through banks.

Next, we study the relationship between BGPR and domestic loan origination at the bank level using the specification:

$$log(orig_{bt}) = \beta_1 BGPR_{bt} + \beta_2 BGPR_{bt-1} + \delta Z_{bt-1} + \gamma_t + \alpha_b + \epsilon_{bit}, \tag{8}$$

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

Table 5 reports the results. Columns (1)–(2) show that an increase in BGPR, as measured by either $BGPR^N$ or $BGPR^T$, significantly reduces U.S. banks' domestic loan origination at the bank level. A one-standard-deviation increase in BGPR reduces U.S. banks' loan origination to U.S. firms by approximately 25 percent on average. Columns (3)–(4) further decomposes the result on $BGPR^T$ into a component isolating perceptions of the threats of geopolitical risk ($BGPR^{T(Threat)}$) and a component based on perceptions of geopolitical risk due to its realizations ($BGPR^{T(Act)}$).

Mechanism. Next, we proceed to test and validate the role of foreign exposure in driving the spillover effects on domestic loan origination, building on the results on the stickiness of local claims from Section 3. To this end, we run Equations (7) and (8) using BGPR indices decomposed into two separate components to distinguish between exposure from local claims and cross-border claims:

$$BGPR_{bt}(\mathbf{1}(\text{Cross-border})) = \sum_c \mathbf{1}(\text{Cross-border})_{bct-1} \times \omega_{bct} CGPR_{ct}, \tag{9a}$$

$$BGPR_{bt}(\mathbf{1}(\text{Local})) = \sum_c \mathbf{1}(\text{Local})_{bct-1} \times \omega_{bct-1} CGPR_{ct}, \tag{9b}$$

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

$orig_{bt}$	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$BGPR^N_{bt}$	-0.073						
	(0.062)						
$BGPR^N_{bt-1}$	-0.177**						
	(0.073)						
$BGPR^T_{bt}$		-0.046					
		(0.069)					
$BGPR^T_{bt-1}$		-0.173**					
		(0.069)					
$BGPR^{T(Threat)}_{bt}$			-0.049				
			(0.069)				
$BGPR^{T(Threat)}_{bt-1}$			-0.171**				
			(0.069)				
$BGPR^{T(Act)}_{bt}$				0.012			
				(0.038)			
$BGPR^{T(Act)}_{bt-1}$				-0.045			
				(0.039)			
$BGPR^{T^{fin}}_{bt}$					-0.069		
					(0.066)		
$BGPR^{T^{fin}}_{bt-1}$					-0.148**		
					(0.067)		
$BGPR^{T^{fin}(Threat)}_{bt}$						-0.069	
						(0.067)	
$BGPR^{T^{fin}(Threat)}_{bt-1}$						-0.150**	
						(0.067)	
$BGPR^{T^{fin}(Act)}_{bt}$							-0.025
							(0.035)
$BGPR^{T^{fin}(Act)}_{bt-1}$							-0.035
							(0.033)
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	475	475	475	475	475	475	475
R^2	0.955	0.956	0.956	0.952	0.956	0.956	0.953

Note: This table reports results from loan-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 8. $BGPR^N$ denotes bank-specific geopolitical risk index based on $CGPR^N$ or the (recent) country-specific geopolitical risk index from Caldara and Iacoviello (2022). $BGPR^T$ denotes the bank-specific geopolitical risk index based on $CGPR^T$, which is constructed with earnings call transcripts using the NL Analytics platform and captures the perception of geopolitical risk by firms worldwide. $BGPR^{T(Threat)}$ captures firms' perceptions of the threats of geopolitical risk, and $BGPR^{T(Act)}$ captures their perceptions of geopolitical risk due to its realizations. $BGPR^{T^{fin}}$ captures the perception of geopolitical risk by financial firms, and $BGPR^{T^{fin}(Threat)}$ and $BGPR^{T^{fin}(Act)}$ denote 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. *$p < .1$; **$p < .05$; ***$p < .01$.

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.

If the forces that prevent banks with local claims from promptly divesting assets are playing an important role in driving the spillover effects, the coefficients on $\mathbf{1}(\text{Local})_{bct}$ would be negative and significant, whereas those on $\mathbf{1}(\text{Cross-border})_{bct}$ would be insignificant.

Table 6 present 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. 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.2 presents the results with $BGPR^T$ as the main regressor, and all the results are quantitatively and qualitatively similar.

To validate the role of capital constraints outlined in Section 4.1, we run regressions at the bank level with domestic loan origination as the dependent variable and the BGPR indices, along with their interactions with banks' lagged capital positions, as the key regressors. If capital constraints are influencing the spillover effect of geopolitical risk on domestic loan origination, the coefficient on the interactions would 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 interactions are positive, supporting the role of capital constraints in driving the spillover effects.

In addition, we assess whether geopolitical alignment with the United States plays a role

in driving the spillover effects of geopolitical risk on credit provision. Using data on military alliance from the Alliance Treaty Obligations and Provisions (ATOP) project and UN voting records from Fjelstul et al. (2022), we decompose BGPR indices into two components to distinguish between geopolitical risk from countries that are more or less aligned with the United States. Panel (b) of Table 7 shows the results. We find that banks exposed to geopolitical risk from countries more aligned with the United States reduce domestic loan origination to a greater extent in response to increasing geopolitical risk from these countries.

4.3 Geopolitical Risk and Domestic Lending Standards

In addition to loan origination, we analyze the spillover effects of geopolitical risk on U.S. banks' domestic lending standards, using survey data from the SLOOS. Compared to the FR Y-14, the SLOOS data has the advantage that it covers a larger set of banks and extends further back in time, starting in the 1980s.[18]

To measure lending standards, we analyze each bank's response to the survey question regarding whether it tightened or loosened credit standards on C&I loans to large and medium-sized enterprises, with higher values indicating greater loosening of standards. As is common in the literature, we code banks' responses as 1 for tightening, 0 for no change, and -1 for loosening. We regress this variable on the contemporaneous quarterly change and lagged change of BGPR, along with bank fixed effects and a set of macroeconomic and bank-level controls. Following the literature (Bassett et al., 2014), we include the first lag of the dependent variable as a regressor to account for the significant persistence observed in SLOOS responses. The baseline regression equation is specified as follows:

$$\begin{aligned} ls_{bt} &= \beta_0 ls_{bt-1} + \beta_1 \Delta \log(BGPR_{bt}) + \beta_2 \Delta \log(BGPR_{bt-1}) + \gamma_1 \Delta X_t + \gamma_2 \Delta X_{t-1} \\ &\quad + \delta_1 Z_{bt} + \delta_2 Z_{bt-1} + \alpha_b + \epsilon_{bt}, \end{aligned} \tag{10}$$

where ls_{bt} denotes the response of bank b to the SLOOS covering quarter t, $BGPR_{bt}$ denotes the BGPR indices, and X_t represents a set of macroeconomic controls. Specifically, we include the 2-year Treasury yield, the slope of the yield curve (10y-2y), the CBOE Volatility

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

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

(a) Loan Level

$orig_{bit}$	(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

$orig_{bt}$	(1)	(2)	(3)	(4)	(5)	(6)
$BGPR^N_{bt}(\mathbf{1}(\text{Local}))$	-0.061	-0.070			-0.069	-0.076
	(0.061)	(0.062)			(0.061)	(0.062)
$BGPR^N_{bt-1}(\mathbf{1}(\text{Local}))$	-0.168**	-0.175**			-0.169**	-0.176**
	(0.076)	(0.074)			(0.075)	(0.074)
$BGPR^N_{bt}(\mathbf{1}(\text{Cross-border}))$			-0.175	-0.126	-0.179	-0.125
			(0.229)	(0.230)	(0.234)	(0.235)
$BGPR^N_{bt-1}(\mathbf{1}(\text{Cross-border}))$			-0.108	-0.074	-0.198	-0.164
			(0.265)	(0.263)	(0.288)	(0.285)
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	0.954	0.955	0.952	0.952	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 (7), using $BGPR$ constructed using Equation 9. Panel (b) reports results from regressions at the bank-time level based on Equation (8). 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 7: Role of Capital Position and Political Alignment

(a) Capital Position

$orig_{bt}$	(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 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) Political Alignment

	Military Alliance		UN Voting	
$orig_{bt}$	(1)	(2)	(3)	(4)
$BGPR^N_{bt}(\mathbf{1}(\text{More Align}))$	-0.065		-0.044	
	(0.057)		(0.065)	
$BGPR^N_{bt-1}(\mathbf{1}(\text{More Align}))$	-0.163**		-0.213***	
	(0.069)		(0.082)	
$BGPR^N_{bt}(\mathbf{1}(\text{Less Align}))$	-0.002		-0.056	
	(0.046)		(0.061)	
$BGPR^N_{bt-1}(\mathbf{1}(\text{Less Align}))$	-0.020		0.096	
	(0.041)		(0.063)	
$BGPR^T_{bt}(\mathbf{1}(\text{More Align}))$		-0.041		-0.056
		(0.070)		(0.069)
$BGPR^N_{bt-1}(\mathbf{1}(\text{More Align}))$		-0.176**		-0.165**
		(0.070)		(0.070)
$BGPR^N_{bt}(\mathbf{1}(\text{Less Align}))$		-0.022		0.021
		(0.033)		(0.028)
$BGPR^N_{bt-1}(\mathbf{1}(\text{Less Align}))$		0.027		-0.016
		(0.028)		(0.033)
Bank FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	475	475	475	475
R^2	0.955	0.955	0.956	0.956

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. Panel (a) uses $BGPR^N$, lagged Tier 1 capital ratio, and their interaction as the regressors. Bank control includes lagged liquid asset ratio. Panel (b) uses BGPR indices that are decomposed into two components to distinguish between geopolitical risk from countries that are more or less aligned with the United States. 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. *$p < .1$; **$p < .05$; ***$p < .01$.

Index (VIX), the S&P 500 index, and U.S. industrial production as macro controls. The BGPR index, VIX, S&P 500 index, and industrial production are included as quarterly log changes, while other variables, except the lagged dependent variable, enter the regression as simple changes. We also include bank fixed effects (α_b) and and control for banks' responses to whether loan demand changed, denoted by Z_{bt}, as well as banks' lagged Tier 1 capital ratio and liquid asset ratio.

Table 8 presents the baseline results using a sample spanning from 1990:Q2 to 2022:Q2. The regression in column (1) includes the $BGPR^N$ index and its lag, along with the lagged dependent variable and fixed effects as regressors. Column (2) adds the set of macro controls. Column (3) further incorporates controls for credit demand by including banks' responses to the question of whether credit demand increased or decreased, as well as banks' Tier 1 capital ratios and liquid asset ratios. In all columns, the coefficients associated with $BGPR^N$ are statistically significant, often at the 1 percent level.[19] Columns (4) through (6) repeat the exercise using $BGPR^T$, which largely confirms the results.

In terms of magnitude, a one-standard-deviation increase in BGPR results in 2 percent of banks shifting from keeping lending standards unchanged to tightening them in the same quarter, with an additional 4 percent tightening lending standards in the following quarter (column 3).

Parallel to table 6, we investigate whether the effect of BGPR on bank lending standards is driven by exposure through local claims versus cross-border claims. Table 9 presents the results, confirming that the tightening effect of BGPR on lending standards is primarily driven by banks' local exposures, consistent with our proposed mechanism. Appendix Table A.3 displays results using $BGPR^{T(Act)}$, $BGPR^{T(Threat)}$, $BGPR^{T^{fin}(Act)}$, and $BGPR^{T^{fin}(Threat)}$ to measure banks' exposure to geopolitical risk. These findings align with our earlier results based on the FR Y-14 data, indicating that banks respond predominantly to geopolitical risk arising from threats rather than acts.

In contrast to the regressions that use loan origination as the dependent variable, the results based on the SLOOS do not include time fixed effects. Including time fixed effects renders the coefficients associated with BGPR insignificant, which is not surprising. With

[19]The years included in the sample vary depending on data availability once control variables are added.

Table 8: Geopolitical Risk and Domestic Lending Standards

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)
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	3099	3050	2095	1486	1486	1476
R^2	0.235	0.294	0.331	0.258	0.339	0.352

Note: This table reports regression results at the bank-time level based on Equation (10) using a sample that generally spans from 1990:Q2 to 2022:Q2. The dependent variable (ls) indicates whether a bank reported tightening, no change, or loosening of credit standards on C&I loans to large and medium-sized firms during quarter t. $BGPR$ denotes the bank-specific geopolitical risk index constructed based on Equation (1), with $BGPR^N$ used in columns (1)-(3) and $BGPR^T$ in columns (4)-(6). Columns (2) and (4) include the (log) changes in 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 as macro controls. Columns (3) and (6) additionally control for loan demand as well as bank 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-time level. *$p < .1$; **$p < .05$; ***$p < .01$.

bank fixed effects included, the regressions rely solely on cross-sectional heterogeneity to identify the effects of BGPR on credit supply. However, the SLOOS outcome variable is limited to three discrete values: banks report tightening, loosening, or no change in credit standards. As a result, when two banks experience increasing exposure to GPR at different levels but both tighten credit standards to some degree, the outcome variable will still take the same value (-1) for both. In other words, the outcome variable provides only a coarse measure of bank behavior, making pure cross-sectional identification challenging. Despite this limitation, the SLOOS results align with the findings for loan origination: spillover effects are driven by local claims, and threats are the primary driver of results. Thus, the SLOOS results offer additional evidence that geopolitical risk affects bank credit supply through the proposed channel, even with this caveat.

While the focus of this paper is on C&I loans, Appendix Table A.4 shows that banks also tighten lending standards on commercial real estate loans in response to geopolitical risk. We interpret this finding as further evidence that banks contract their credit supply in response to increased foreign geopolitical risk. Notably, the U.S. commercial real estate sector is likely more insulated from geopolitical risks abroad compared to firms in some other industries, such as those involved in importing or exporting, which are more directly exposed to risks abroad. As a result, credit demand effects are even less likely to influence our findings.

5 Conclusion

This paper studies the impact of geopolitical risk on banks' foreign operations and the resulting spillover effects on their domestic credit supply. Using 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, banks persist in lending to countries experiencing heightened geopolitical risk through their branches and subsidiaries, while reducing cross-border lending to these same countries. Importantly, banks do not respond to other types of risk in a similar manner.

These findings highlight the trade-offs and frictions that hinder the prompt divestiture

Table 9: Geopolitical Risk Transmission to Lending Standards, Cross-Border versus Local 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**(Xborder)))		-0.020**	-0.011			
		(0.008)	(0.009)			
$\Delta \log(BGPR^N_{bt-1}$ (**1**(Xborder)))		-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**(Xborder)))					-0.004	0.011
					(0.011)	(0.013)
$\Delta \log(BGPR^T_{bt-1}$ (**1**(Xborder)))					-0.017*	-0.014
					(0.010)	(0.012)
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Macro Controls	Yes	Yes	Yes	Yes	Yes	Yes
Bank Controls	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 results from bank-time level regressions that study whether the effect of geopolitical risk on banks' lending standards stems from banks' local exposures versus cross-border exposures, using a sample that generally runs from 1990:Q2 to 2022:Q2. The dependent variable (ls) indicates whether a bank reported tightening, no change, or loosening of credit standards on C&I loans to large and medium-sized firms during quarter t. $BGPR^N_{bt}$ (**1**(Cross-border)) was constructed based on Equation 9a, and $BGPR^N_{bt}$ (**1**(Local)) based on Equation 9b. All columns include bank fixed effects, macro controls, bank-level controls as well as the lagged dependent variable as a regressor. The geopolitical risk indices are standardized by their respective standard deviations within the sample. Standard errors, shown in parentheses, are clustered at the bank-time level. *$p < .1$; **$p < .05$; ***$p < .01$.

of foreign assets in response to geopolitical risk. We show that these forces drive significant spillover effects: in response to an increase in geopolitical risk abroad, U.S. banks significantly reduce lending and tighten domestic lending standards to domestic firms. The spillovers are more pronounced when the risk originates from countries where banks have affiliates or from countries that are more geopolitically aligned. These results underscore the unique challenges geopolitical risk poses to the global banking system and its far-reaching implications for domestic credit markets.

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Appendix

A Supplementary Figures and Tables

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*

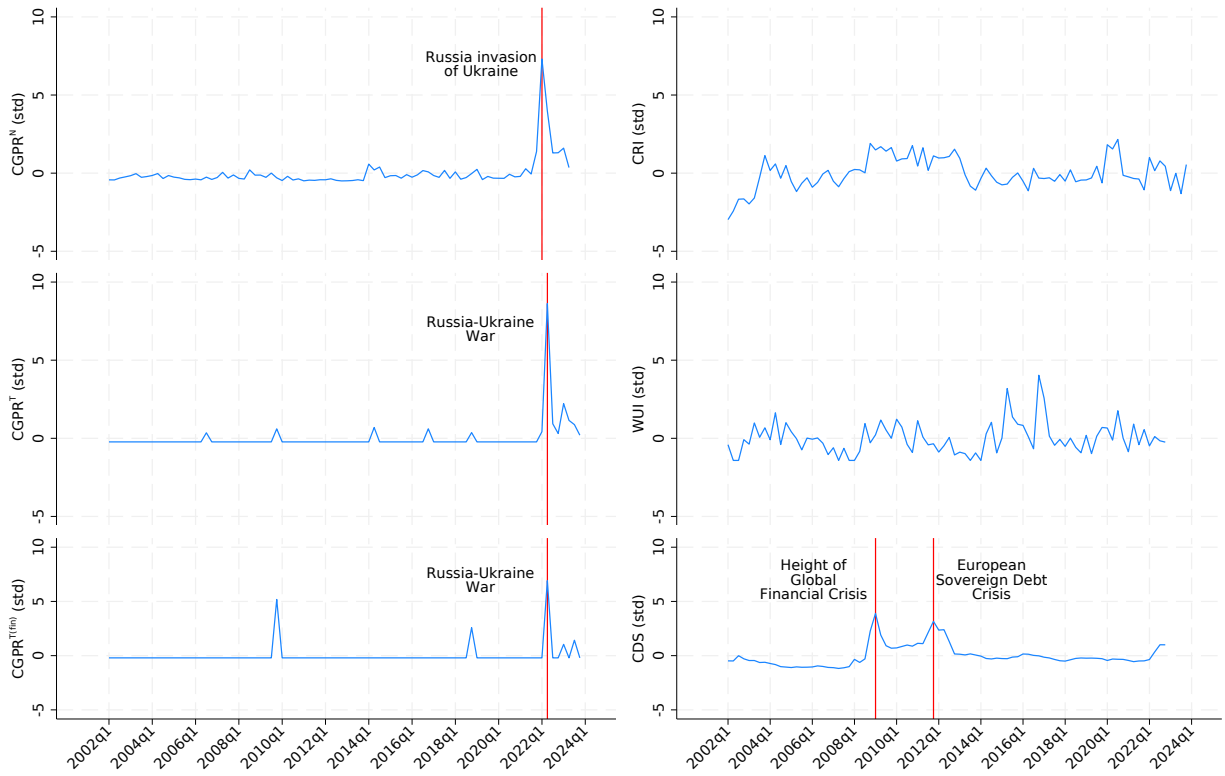
Panel C. Excluded words

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

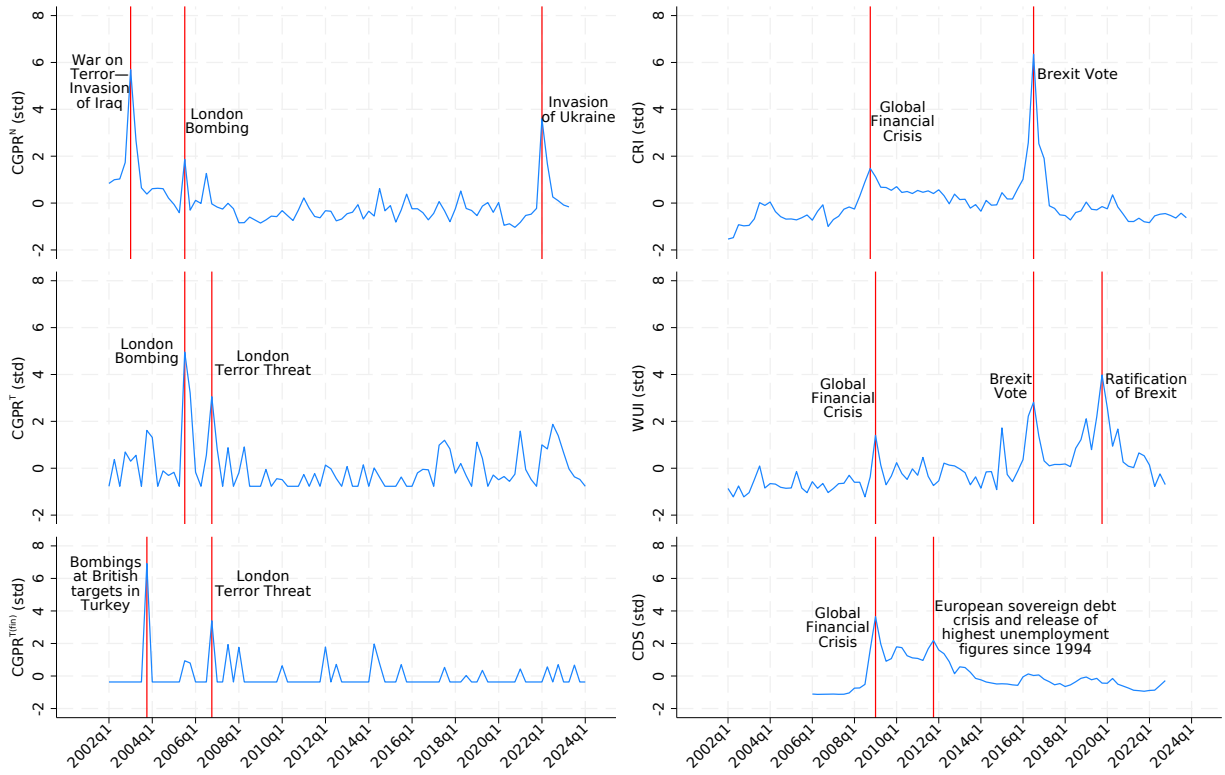
Note: This table lists the search query used to construct the country-specific geopolitical risk index based on earnings call transcripts ($CGPR^T$). The query is based on the one in Caldara and Iacoviello (2022) with slight modification. The truncation character (*) denotes a search including all possible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

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

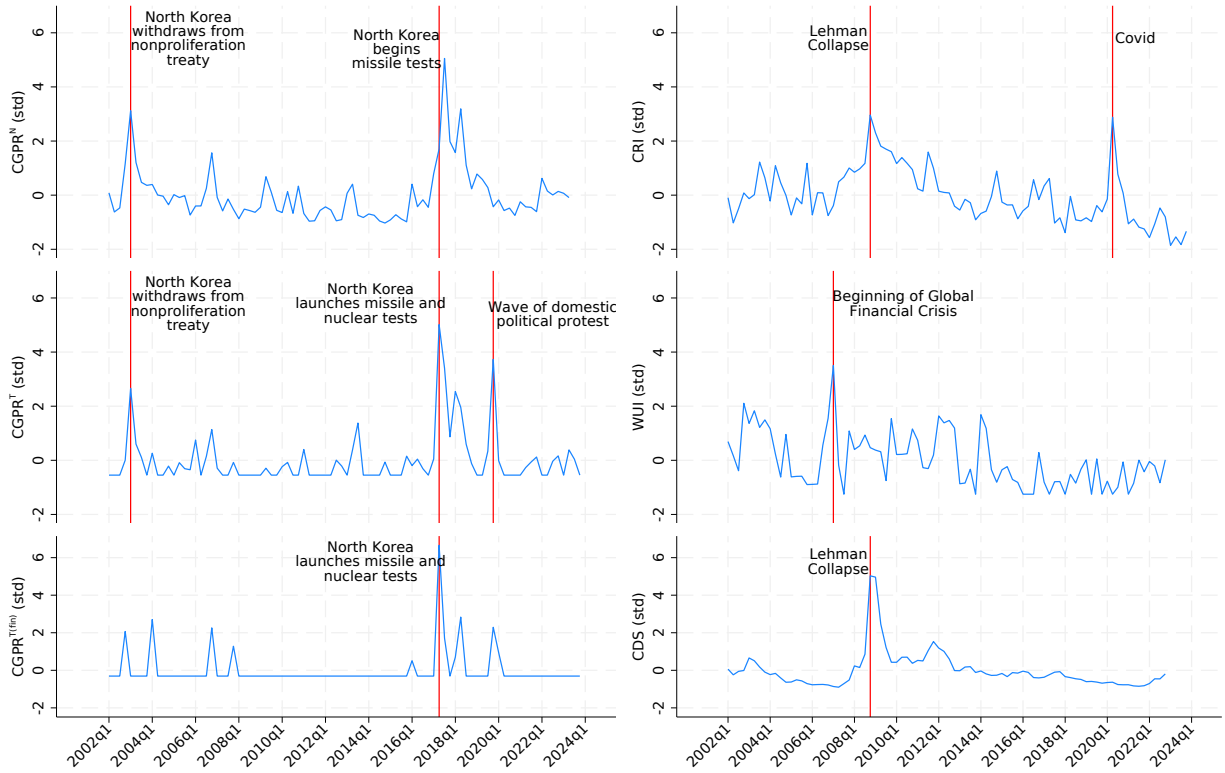
(a) Poland



(b) United Kingdom



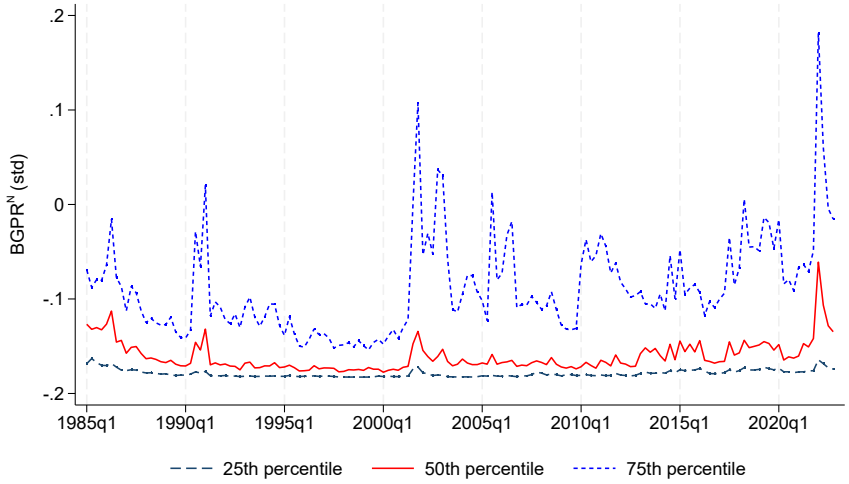
(c) South Korea



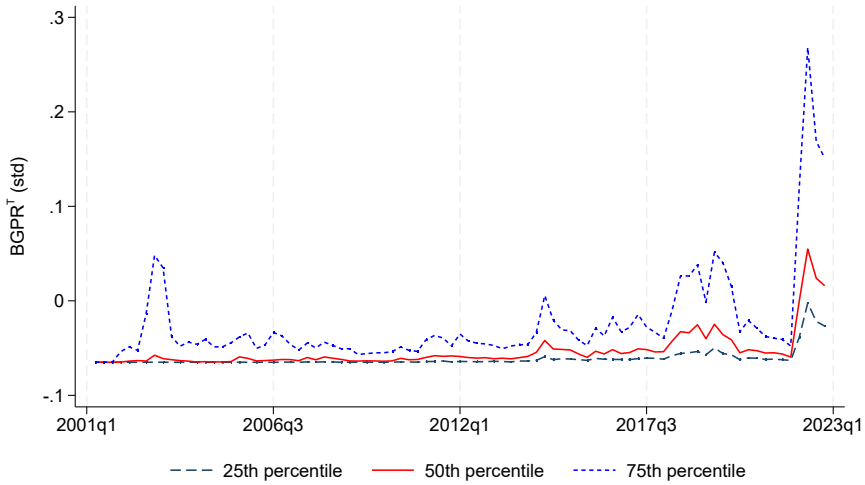
Note: Panels (a), (b), and (c) illustrate the country-specific geopolitical risk (CGPR) indices and other risk indices for Poland, the United Kingdom, and South Korea, respectively, covering the period from 2002:Q1 to 2023:Q4. In each panel, the left charts, from top to bottom, display CGPR from Caldara 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 Robustness of Results

Table A.1: Geopolitical Risk and Foreign Credit Reallocation, $CGPR^T$

	Total		Cross-border		Local	
exp_{bct}	(1)	(2)	(3)	(4)	(5)	(6)
$CGPR^T_{ct}$	-0.016	-0.021**	-0.021	-0.026**	-0.039	-0.024
	(0.013)	(0.010)	(0.014)	(0.012)	(0.025)	(0.021)
$CGPR^T_{ct-1}$	-0.001	-0.000	-0.003	-0.003	-0.005	-0.008
	(0.012)	(0.009)	(0.013)	(0.010)	(0.035)	(0.032)
$\mathbf{1}(Sanction)_t$	-0.064***	-0.127***	-0.097***	-0.172***	0.020	-0.234***
	(0.019)	(0.028)	(0.020)	(0.032)	(0.033)	(0.050)
$ln(Exch.Rate)_{t-1}$		-0.149***		-0.119**		0.039
		(0.043)		(0.046)		(0.053)
$ln(StockIndex)_{t-1}$		0.131***		0.195***		-0.079
		(0.027)		(0.028)		(0.054)
$ln(CDS)_{t-1}$		-0.035*		-0.029		-0.106***
		(0.018)		(0.020)		(0.028)
Bank-country FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	64333	37742	63048	36908	20643	12542
R^2	0.925	0.943	0.911	0.931	0.899	0.928

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 1986: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, log sovereign CDS spread, 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.2: 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 (7), using a modified *BGPR* constructed using Equation 9. Panel (b) reports results from regressions at the bank-time level based on Equation (8). 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.3: Geopolitical Risk and Domestic Lending Standards, Acts vs. Threats

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 regression results based on Equation (10). The dependent variable (ls) indicates whether a bank reported tightening, no change, or loosening of credit standards on C&I loans to large and medium-sized firms for quarter t. Each column employs a different variant of the BGPR index based on firms' earnings call transcripts. All specifications include bank fixed effects, macro 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.4: 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 results from regressions following Equation (10). The dependent variable (ls) indicates whether a bank reported tightening, no change, or loosening of credit standards on commercial real estates loans. $BGPR$ denotes the bank-specific geopolitical risk index constructed based on Equation (1), with $BGPR^N$ used in columns (1)-(3) and $BGPR^T$ in columns (4)-(6). Columns (2) and (4) include the (log) changes in 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 as macro controls. Columns (3) and (6) additionally control for loan demand as well as bank 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. *$p < .1$; **$p < .05$; ***$p < .01$.