# Geopolitical Risk and Global Systemically Important Banks' Default Risk: Evidence from CDS Spreads

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## Abstract

Our study explores whether geopolitical risk influences the default risk of Global Systemically Important Banks (G-SIBs) differently from non-G-SIBs, using credit default swap (CDS) spreads as our primary measure of default risk. Our sample of non-G-SIBs is composed of the largest banks which are in the same country as the G-SIBs but are not classified as being systemically important. We find that a global geopolitical risk measure notably escalates the default risk of banks, but the effects are in different directions for G-SIBs and non-G-SIBs. Geopolitical risk has a negative correlation with CDS spreads for G-SIBs, but a positive one for non-G-SIBs. We find that G-SIB status reduces the CDS spreads by 14.4%, to 16.2%, relative to the non-G-SIBs in the presence of geopolitical risk. Our findings hold true even when we use an alternate measure of default risk. When we look deeper into the elements of geopolitical risk, we observe that geopolitical threats significantly reduce CDS spreads for G-SIBs, whereas acts increase them for both types of banks, with a more pronounced impact on non-G-SIBs. Interestingly, after employing a difference-in-difference estimation, we find that G-SIBs consistently exhibit lower CDS spreads as compared to non-G-SIBs. This could reflect the impact of an implicit government guarantee for G-SIBs, which raises the moral hazard concern.

Keywords: Geopolitical Risk, Credit Default Swap Spread, Global Systemically Important Banks (G-SIBs), Too Big to Fail (TBTF), Moral Hazard

JEL Classification: D81, G15, G21

# 1. Introduction

"When foreign geopolitical risk rises, bank impacts can hit close to home. Banks significantly tighten domestic lending standards and reduce lending to domestic firms. The rising geopolitical risk increases the credit risk of banks which have exposure to the affected countries." - (Shen, 2024)

The 2023 Global Financial Stability Report by the International Monetary Fund highlights the escalation of global geopolitical tensions, primarily due to deteriorating US-China relations and Russia's invasion of Ukraine (International Monetary Fund, 2023). These tensions have significantly impacted cross-border portfolios and bank allocations, with a notable 15% decrease in bilateral cross-border allocation of portfolio investment and bank claims between the US and China. Geopolitical shocks pose substantial financial stability risks for the global banking sector. They can trigger a sudden reversal of cross-border credit and investments, leading to financial fragmentation, increased debt rollover risks, and higher funding costs for banks. Additionally, heightened uncertainty can widen sovereign bond and credit spreads, reducing the value of banks' assets and increasing their funding costs.

Further, supply chain disruptions and commodity market fluctuations can affect domestic growth and inflation, exacerbating market and credit losses for banks, and reducing their profitability and capitalization. This stress on solvency and liquidity reduces banks' risk-taking capacity, leading to decreased domestic lending and further economic decline. Overall, the increased financial fragmentation due to geopolitical tensions could expose nations to greater risks from both internal and external shocks. This reduction in risk diversification options could increase

the likelihood of systemic financial crises in the long term (International Monetary Fund, 2023). Considering the profound influence of geopolitical risk on the global banking sector, it is essential to empirically investigate how these risks affect the default risk of banks, particularly those classified as systemically important.

Using a unique dataset consisting of monthly CDS data for forty-six (46) banks in 10 countries spanning from January 2012 to November 2023, we empirically examine the impact of geopolitical risk on the credit default swap (CDS) spreads of these banks, which serve as a proxy for default risk. Our sample includes 23 banks that are designated as Global Systemically Important Banks (G-SIBs) and a comparable group of large banks not considered systemically important (non-G-SIBs). We utilize five-year senior CDS instruments since they are the most liquid contracts and makeup 85% of the entire CDS market (Cottrell et al., 2021). Global geopolitical risk is measured using an index named the Geopolitical Risk Index (GPR index) constructed by Caldara and Iacoviello (2022) that tracks the percentage of monthly news articles that mention adverse geopolitical events and related threats. This study allows us to understand how changes in geopolitical risk may affect the perceived riskiness of banks and explore whether geopolitical risk affects the default risk of G-SIBs differently compared to non-G-SIBs. CDS prices primarily signal default risk and are frequently used as a gauge of creditworthiness. Specifically, CDS spreads represent the insurance cost against potential losses from a firm's default. These spreads are standardized measures for evaluating default risk (Hasan et al., 2023; Ye et al., 2022). In this study, we investigate the role of geopolitical risk as a determinant of bank default risk.

Geopolitical risks, such as the 2016 US presidential election, have been shown to increase bank CDS spreads, indicating a higher cost of default insurance (Hachenberg et al., 2017). Studies

suggest that geopolitical tensions can raise sovereign risk, leading to a rise in both sovereign and corporate CDS spreads, demonstrating a spillover effect (Bedendo & Colla, 2015; Demiralay et al., 2024). Sovereign credit risk is closely linked with bank CDS spreads, particularly during crises, and may offer more immediate insights into banks' default probabilities than the banks' own CDS spreads. Investors often trade sovereign CDSs as a proxy for bank default risk, which can affect banks' asset values and funding costs (Avino & Cotter, 2014). Macroeconomic uncertainties, including geopolitical risks, can significantly impact corporate investments, capital flows, consumer confidence, and bank lending behaviors (Wisniewski & Lambe, 2015). Banks may respond to increased uncertainty by restricting credit, tightening lending standards, and raising interest rates, which can lead to adverse selection and moral hazard issues (Bloom, 2009; Bordo et al., 2016; Kim et al., 2023; Wang et al., 2023). High geopolitical risk periods can lead to negative investor sentiment, which can adversely affect bank stability (Shleifer & Vishny, 2010). Based on these findings, we hypothesize that geopolitical risk is positively associated with the overall CDS spreads of large global banks.

However, the effect of geopolitical risk on G-SIBs may differ from its effect on non-G-SIBs. One stream of research suggests that G-SIBs may experience a greater increase in default risk from geopolitical risks than non-G-SIBs due to factors such as their size, complexity, and global interconnectedness. G-SIBs, primarily based in the US and Europe, are exposed to a broad spectrum of geopolitical risks due to their extensive operations across multiple regions (Violon et al., 2017). With significant cross-border loans and investments, G-SIBs are more prone to defaults in geopolitically tense regions than non-G-SIBs, which tend to operate more locally. The deep interconnectivity of G-SIBs with global financial markets and institutions makes them susceptible to market volatility caused by geopolitical risks (Moratis & Sakellaris, 2021; Peterson & Arun,

2018). Global bank equity connectedness, which increases during crises, is significantly affected by geographic factors (Demirer et al., 2018). In contrast, non-G-SIBs have simpler structures, more localized operations, and less exposure to international markets (Peterson & Arun, 2018). Based on this line of reasoning, we propose that geopolitical risk will result in higher CDS spreads for G-SIBs compared to non-G-SIBs.

Another perspective in the literature suggests that geopolitical risk might lead to a reduction in CDS spreads for G-SIBs as opposed to non-G-SIBs. This is primarily because G-SIBs tend to have tighter CDS spreads, likely due to their "too-big-to-fail" (TBTF) perception. This notion implies that in times of financial strain, investors expect these banks to receive government backing, which influences how the market prices their risk (Araten & Turner, 2013; Cetina & Loudis, 2016). The implicit assurance from the government, inherent in the TBTF doctrine, is intended to protect G-SIBs against defaults, thereby generally reducing their probability of default and, consequently, their cost of borrowing. This aligns with the profit-based-reaction hypothesis, which posits that the market perceives G-SIBs as benefiting from an anticipated government safety net that could be deployed during financial crises, thereby giving these banks an edge in funding costs (Markoulis et al., 2022). Moreover, stricter capital requirements are believed to diminish default risk (Couaillier & Henricot, 2023). Higher capital mandates are often viewed by investors as decreasing the likelihood of default for these banks, which could, in turn, lead to narrower CDS spreads. Given that non-G-SIBs lack the same implicit government support and are not required to hold additional capital, we propose the alternate hypothesis that geopolitical risk will result in lower CDS spreads for G-SIBs compared to non-G-SIBs.

Given the alternate perspectives on the impact of geopolitical risk on CDS spreads for G-SIBs and non-G-SIBs, we examine whether G-SIB status significantly influences banks' CDS spreads.

First, to understand how geopolitical risk affects CDS spreads, we run an OLS regression using our full sample of G-SIBs and non-G-SIBS. We find that higher geopolitical risk leads to higher CDS spreads suggesting increased default risk for banks during periods of high geopolitical uncertainty. Specifically, we find that a one standard deviation increase in geopolitical risk is associated with an increase of 6.4% in CDS spread with firm fixed effects included in the model. Second, we conduct univariate tests to compare the CDS spreads of G-SIBs with non-GSIBs. We find that over the twelve-year period from January 2012 to November 2023, G-SIBs CDS spreads were 7.84 basis points lower than those of non-G-SIBs. Third, to assess the impact of G-SIB status on CDS spreads, we re-run our regression analysis using subsamples of G-SIBs and non-G-SIBs. For G-SIBs, geopolitical risk negatively correlates with CDS spreads, indicating that as geopolitical risk increases, the cost of insuring against default for these banks decreases. This is statistically significant at the 1% confidence level. In contrast, the analysis conducted on non-G-SIBs revealed that an increase in geopolitical risk leads to an increase in default risk, as indicated by a significantly positive coefficient for geopolitical risk. Our results are robust to the use of an alternate empirical model that includes an interaction term (GSIB*GPR) to assess the differential impact of G-SIB status. Our findings indicate that the G-SIB designation leads to a reduction in CDS spreads by 14.4% to 16.2% compared to non-G-SIBs in the face of heightened geopolitical risk.

A no-arbitrage approximation suggests that all else being equal, the CDS spread should be identical to the equivalent credit spread, commonly referred to as the funding spread, between the

yield to maturity on a risky par bond and the benchmark risk-free rate (Araten & Turner, 2013; Chen et al., 2010; Duffie, 1999; Hull & White, 2000; Longstaff et al., 2005). Our findings suggest that G-SIBs exhibit lower CDS spreads during times of heightened geopolitical risk, which translates to a lower default probability for these banks. This advantage is attributed to the perception that G-SIBs, due to their systemic importance, have stronger regulatory safeguards and better access to liquidity backstops, enhancing their resilience against geopolitical uncertainties. Therefore, while geopolitical risk increases default risk for non-G-SIBs, it reduces default risk for G-SIBs, reflecting their advantage of being designated as such.

We employ a difference-in-difference (DiD) methodology to further elucidate the pronounced effect of the G-SIB designation on bank CDS spreads and to establish a causal connection between geopolitical risk and CDS spreads. We concentrate on two pivotal geopolitical incidents—the annexation of Crimea by Russia in 2014 and the 2015 terrorist attacks in Paris—events that coincided with significant surges in global geopolitical risk. Within this framework, G-SIBs are identified as the treatment group, while non-G-SIBs serve as the control group. The key coefficient, GSIB*POST, is designed to measure the divergence in CDS spreads for G-SIBs following these events, relative to non-G-SIBs. The DiD analysis, which is structured to demonstrate causality, indicates that post-event, G-SIBs benefitted from lower CDS spreads when compared to non-G-SIBs. The interaction term coefficients are consistently negative and reach statistical significance at the 1% level for both events. Ultimately, our DiD analysis substantiates a causal relationship between geopolitical risk and the differential CDS spreads observed. These findings highlight the protective buffer G-SIBs enjoy from geopolitical risk repercussions, attributed to their perceived TBTF status, which in turn presents a significant moral hazard concern.

In our robustness checks, we replaced the CDS spread with alternative indicators that reflect the risk of default: the 1-year and 5-year Probability of Default (PD) metrics from the Credit Research Initiative (CRI) developed at the National University of Singapore. PD figures are derived from a blend of company-specific and broader market information. We conducted regression analyses with CRI:PD:1 and CRI:PD:5 as the dependent variables, which denote default risk for 1 year and 5 years, for both G-SIBs and non-G-SIBs in line with Dewenter and Riddick (2018). The results revealed that for non-G-SIBs, the coefficient linked to geopolitical risk is positive and exhibits statistical significance at the 10% level when CRI:PD:5 is the dependent variable. This implies that geopolitical risk has a direct and positive effect on the default risk for non-G-SIBs. Conversely, for G-SIBs, the coefficients of geopolitical risk are negative and are statistically significant at the 5% levels for both CRI:PD:1 and CRI:PD:5. These results confirm our prior findings.

In further analysis, we differentiate the effects of geopolitical threats and acts on the CDS spreads of G-SIBs and non-G-SIBs. We find that geopolitical threats significantly reduce CDS spreads for G-SIBs, likely due to the market's belief in their TBTF safety net. Similarly geopolitical threats lead to a reduction in CDS spreads for non-G-SIBs, but the effect is more pronounced for G-SIBs. Large non-G-SIBs are believed to benefit from some level of implicit guarantee due to their size. For example, the collapse of Silicon Valley Bank (SVB) led to liquidity outflows at Credit Suisse, contributing to its collapse. This underscores SVB's systemic importance, highlighted by its status as one of the largest banks in the US with assets exceeding $500 billion as of March 2023, despite not being designated as a G-SIB (Nekhili et al., 2023). On the other hand, geopolitical acts, which are actual events, lead to increased CDS spreads for both groups,

with a more pronounced effect on non-G-SIBs. This suggests that while G-SIBs may benefit from perceived protection during threats, this advantage lessens during real geopolitical events.

The study contributes to the existing research on bank CDS spreads by focusing on geopolitical risk, highlighting its growing importance as a threat to banking system stability. Previous research examined the effects of bank-specific factors such as balance sheet quality, liquidity, and profitability, as well as macro-financial factors such as the regulatory environment and banking sector concentration (Annaert et al., 2013; Benbouzid et al., 2017; Cottrell et al., 2021). Prior studies have also examined the role of interbank lending risk and macroeconomic uncertainties, including economic and political factors, on CDS spreads (Mokdadi & Saadaoui, 2023; Nguyen & Thuy, 2023; Pan et al., 2024; Waisman et al., 2015). While the impact of geopolitical risk on bank loan costs has been studied, its role as a determinant of default risk has not been explored until now, making this study a first effort in that direction.

Moreover, our research contributes to the empirical literature on G-SIBs by examining the difference in default risk between G-SIBs and other similar-sized non-G-SIBs during heightened geopolitical risk. A number of studies document lower CDS spreads of G-SIBs over non-G-SIBs due to the implicit TBTF government policy (Araten & Turner, 2013; Bellia et al., 2020; Bijlsma et al., 2014; Cetina & Loudis, 2016; Demirgüç-Kunt & Huizinga, 2013). However, there is a notable lack of empirical research on the differences in default risk between G-SIBs and non-G-SIBs during times of significant geopolitical risk. We address this critical gap and complement the existing TBTF literature.

The CDS spread is also indicative of the cost of wholesale debt funding (Araten & Turner, 2013; Cottrell et al., 2021). Our study suggests that G-SIB status may lead to lower funding costs during periods of high geopolitical risk, hinting at bailout expectations and moral hazard. This

TBTF perception could encourage riskier behavior by G-SIBs, potentially increasing the financial system's protection costs (Behn & Schramm, 2021; Dewenter & Riddick, 2018). The recent failure of a government bailout to prevent Credit Suisse's collapse highlights significant implications for moral hazard and TBTF policy. The funding cost advantage enjoyed by G-SIBs indicates a worsening of moral hazard amidst geopolitical risk, urging prudential regulatory bodies to adopt more prudent risk management practices, and recognizing that government bailout support is not always guaranteed.

Furthermore, the heterogeneous effects of geopolitical risk on G-SIBs compared to non-G-SIBs pose a potential systemic risk factor from a policy perspective. CDS, as an indicator of default risk may be obfuscated by the positive correlation between geopolitical risk and CDS spreads for G-SIB banks. In future negative geopolitical events, policymakers may be allured into a false sense of security if CDS spreads for G-SIBs reduce. This would potentially lead to a delayed reaction such as letting Lehman Brothers fail during the Global Financial Crises in 2008. Therefore, our study highlights the potential risk associated with using CDS spreads as an indicator of default risk.

The remainder of the paper is organized as follows. Section 2 provides a brief review of the relevant literature and hypotheses. Section 3 describes the data, sample, and variable construction. Section 4 presents the empirical results. Section 5 concludes.

## 2. Background Literature and Hypotheses Development

In this section, we review the prior literature on CDS spreads and G-SIBs. This is followed by hypotheses development.

## 2.1 **CDS spreads**

Since their introduction in the early 2000s, CDSs have revolutionized the markets for fixed income and credit. These instruments allow sellers to offer buyers protection from credit-related events concerning specific reference entities, in return for regular premium payments. For banks, the CDS spread is a crucial barometer of how the market views their creditworthiness and the likelihood of default. This spread reflects not just the individual characteristics of a bank, but also the wider economic and financial conditions, and the political and regulatory frameworks of the nation the bank is situated in, as noted by researchers such as Benbouzid et al. (2017), Chang et al. (2019), and Das et al. (2014). The research in this paper is based on CDS data sourced from a Bloomberg Terminal. The CDS spread is considered a more straightforward indicator of a bank's cost of funds than deposit funding costs—which may be obscured by various fees and conditions—or the spread paid on bank-issued bonds, which are often complicated by call options that hinder direct comparisons between banks, as suggested by Cetina and Loudis (2016).

A significant body of research has focused on identifying the factors that influence CDS spreads and the broader concept of default risk. Galil et al. (2014) found that variables such as stock returns, volatility shifts in stock returns, and median CDS spread variations are key in explaining the movements in CDS spreads. The impact of both private and public information, as well as credit spreads, on CDS spreads at a corporate level has also been scrutinized (Blanco et al., 2005; Norden, 2017). Additionally, extensive studies have delved into the determinants of CDS spreads for banks, highlighting the influence of firm-specific characteristics and macroeconomic factors—including the quality of a bank's balance sheet, asset liquidity, leverage ratios, yield curve slopes, CDS market liquidity, overall market liquidity, and interbank funding spreads such as

LIBOR-OIS. The concentration within the banking sector is also seen as a pivotal factor at the bank level (Benbouzid et al., 2017; Cottrell et al., 2021). Amidst rising global uncertainties, new research has begun to examine the connection between various macroeconomic uncertainties—such as economic and political instability—and CDS spreads at both corporate and sovereign levels (Pan et al., 2024; Waisman et al., 2015). Yet, the link between geopolitical uncertainty and banks' default risk remains unexamined. Our study investigates this gap, highlighting the impact of geopolitical risks in potentially precipitating crises that could threaten global financial stability.

### 2.2 **G-SIBS**

The 2008 crisis highlighted the TBTF problem, prompting global regulatory changes such as the US's Dodd-Frank Act and the Financial Stability Board's (FSB) efforts to fortify the financial system. The FSB, established in April 2009, was charged with pinpointing key international financial institutions and by November 2011, released its first list of 29 G-SIBs. This list, updated annually, was part of broader reforms including proposals for additional regulatory requirements such as capital surcharges and additional loss absorbency requirements to curb default risk and moral hazard, with full implementation in January 2019 (Degryse et al., 2023; Dewenter & Riddick, 2018; Markoulis et al., 2022).

The failure of G-SIB-designated Credit Suisse in March 2023 reinforces the debate on government bailouts and the global resolution strategy of the FSB. Facing liquidity issues due to operational setbacks and market distrust, Credit Suisse activated a CHF 50 billion emergency facility from the central bank (Swiss National Bank). Despite regulatory assurances, the bank failed, leading to a government-backed merger with UBS (Finacial Stability Board, 2023). This event has sparked discussions on the TBTF doctrine and the potential for regulatory overhaul. It

also raises questions about the perceived funding cost benefits for G-SIBs, suggesting a need to reassess the moral hazard associated with such banks.

The collapse of Credit Suisse, despite government intervention, may diminish the perceived safety net for large banks, potentially leading to a shift in TBTF policies and broader financial reforms. This situation has led us to conduct a comparative study of CDS spreads between G-SIBs and non-G-SIBs, particularly in the context of geopolitical tensions. Our goal is to investigate whether G-SIBs, compared to non-G-SIBs, have a lower risk of default due to the perception that they are backed by the government.

### 2.3 **Hypotheses Development**

Amid rising macroeconomic shocks, recent research has focused on the effects of various macroeconomic factors on CDS spreads at both the firm and sovereign levels. For instance, previous studies indicate that the severity of the COVID-19 pandemic correlates with wider CDS spreads at the firm level, with the banking sector being one of the most affected (Apergis et al., 2022; Hasan et al., 2023). In the same vein, economic and political uncertainty has been shown to elevate CDS spreads at the sovereign level. The banking sector is claimed as a potential channel through which this uncertainty increases sovereign risk (Pan et al., 2024). Economic policy uncertainty also notably widens CDS spreads at the firm level, resulting in increased costs for credit protection (Wang et al., 2018; Wisniewski & Lambe, 2015).

There are a limited number of studies that analyze the relationship between geopolitical risk and CDS spreads. The 2016 US presidential election is shown to have increased bank CDS spreads (Hachenberg et al., 2017). Demiralay et al. (2024) argue that geopolitical tensions raise

the sovereign risk of the home country, subsequently driving up the cost of default insurance and increasing CDS spreads. Evidence suggests that an increase in sovereign credit spreads can significantly raise corporate CDS spreads, highlighting a spillover effect from sovereign to corporate credit risk (Bedendo & Colla, 2015). Furthermore, sovereign credit risk is shown to be cointegrated with bank CDS spreads, especially during crises when sovereign CDS spreads may provide more timely information on banks' default probabilities than their own CDS spreads. Investors betting on bank default risk often trade sovereign CDS spreads, viewing them as a primary source of banking risk (Avino & Cotter, 2014). Increasing sovereign credit risk reduces the value of banks' assets and raises their funding costs (International Monetary Fund, 2023).

Overall, macroeconomic uncertainty shocks, such as geopolitical risks, can drastically reduce capital expenditure and output, provoke capital flight, and diminish consumer confidence (Wisniewski & Lambe, 2015). In the context of the bank CDS market, uncertainty factors can influence spreads. Heightened uncertainty prompts banks to restrict credit supply, tighten lending standards, and raise lending rates. Moreover, heightened uncertainty about investment returns causes potential bank borrowers to hesitate, leaving mainly risky borrowers in the market, which creates an adverse selection problem. (Bloom, 2009; Bordo et al., 2016; Kim et al., 2023; Wang et al., 2023). Rising bank loan interest rates compel high-risk borrowers to undertake riskier projects to offset higher borrowing costs, exacerbating moral hazard and potentially increasing the likelihood of bank defaults. Some investors become highly concerned about safeguarding their investments when geopolitical risk is high. As a result, they restructure their portfolios, shifting their investments from riskier assets to safer assets such as gold and silver (Baur & Smales, 2020). This flight to safety could reduce liquidity and heighten the risk of bank failures. Moreover, investor sentiment typically turns negative during periods of heightened geopolitical risk.

According to Shleifer and Vishny (2010), such shifts in sentiment adversely affect bank stability. Building on their arguments, we propose the following hypothesis:

***Hypothesis 1: Geopolitical risk increases bank CDS spreads.***

We intend to disentangle the impact of geopolitical risk on G-SIBs from non-G-SIBs due to their systematic importance. A study by Peterson and Arun (2018) suggests that G-SIBs differ from non-G-SIBs due to factors such as their size, complexity, and interconnectedness in the global financial system. This implies that G-SIBs could face an elevated risk of default from geopolitical factors compared to non-G-SIBs. Systemic importance is determined by several factors: the volume of services it provides, including total exposures and off-balance sheet items; its interconnectedness with other financial institutions; the complexity and opacity of its operations; the availability of substitutes for its services in the economy; and the extent of its operations across different geographical areas.

A strained geopolitical environment increases global financial instability by tightening financial conditions. This impacts key funding markets, asset prices, and cross-border lending. Sanctions and counter-sanctions can disrupt payment systems and financial infrastructure. The volatility in energy prices and the reduction in bilateral trade caused by the Russia-Ukraine conflict has systemic effects, particularly affecting European nations and the United States, thereby exposing banks to increased credit and market risks globally (Jones, 2023; Qureshi et al., 2022).

Most G-SIBs are located in the US and Europe and operate extensively across multiple regions, exposing them to a wider range of geopolitical risks. They engage in complex and diverse financial activities, including cross-border lending, trade finance, and investment banking (Violon et al., 2017), increasing their exposure to geopolitical risks. G-SIBs typically maintain substantial

cross-border loan portfolios and investments, rendering them more vulnerable to defaults in affected regions compared to non-G-SIBs, which typically operate on a more localized scale.

Furthermore, G-SIBs are deeply interconnected with global financial markets and institutions, making them more vulnerable to market volatility triggered by geopolitical risks (Moratis & Sakellaris, 2021; Peterson & Arun, 2018). Demirer et al. (2018) suggest that global bank equity connectedness is significantly influenced by geographic factors and tends to rise during times of crisis. In contrast, non-G-SIBs usually have more localized operations, simpler financial structures, and less exposure to international markets (Peterson & Arun, 2018). In light of these findings, we propose the following hypothesis:

***Hypothesis 2A: Geopolitical risk will result in higher CDS spreads for G-SIBs compared to non-G-SIBs.***

Literature supporting the alternate view that geopolitical risk will lead to a decrease in CDS spreads for G-SIBs compared to non-G-SIBs can be found in studies by Araten and Turner (2013) and Cetina and Loudis (2016). These studies dictate that G-SIBs or banks that are deemed systemic exhibit narrower CDS spreads, attributed to their perceived TBTF status. This status implies that investors anticipate government support in times of financial distress, thereby influencing market perceptions and pricing of default risk associated with G-SIBs. The implicit government guarantee is designed to safeguard G-SIBs or banks that have systemic importance in the event of a default, leading to a reduced likelihood of default and typically lower funding costs. This is consistent with the profit-based-reaction hypothesis which suggests that the market views G-SIBs as benefiting from a perceived government guarantee that could be activated in times of financial trouble, thus granting these banks a funding cost advantage (Markoulis et al., 2022). According to this view, the presence of such a perceived guarantee not only fails to mitigate moral hazard but worsens it,

as it encourages riskier behavior by G-SIBs assuming that they will be rescued by government intervention if necessary. Secondly, tighter bank capital requirements reduce default risk (Couaillier & Henricot, 2023). Since November 2012, the classification of a bank as a G-SIB by the Bank for International Settlements involves using a set of indicators obtained from a sample of banks provided by national prudential authorities. These indicators are aggregated to calculate scores for each bank in the sample. Banks scoring above 130 basis points are assigned to buckets determining their higher loss absorbency capital requirement, commonly known as a capital surcharge, ranging from 1% to 3.5% of risk-weighted assets. Each 0.5% increase in the capital surcharge requirement represents approximately $8 billion in additional required capital. (Degryse et al., 2023; Dewenter & Riddick, 2018; Markoulis et al., 2022). Investors often perceive higher capital requirements as reducing the probability of default for these banks. As a result, these requirements could potentially narrow CDS spreads.

Since non-G-SIBs lack the implicit government guarantee and hence, are not required to maintain additional capital, we posit the following hypothesis.

***Hypothesis 2B: Geopolitical risk will result in lower CDS spreads for G-SIBs compared to non-G-SIBs.***

We are testing the profit-based-reaction hypothesis, which posits that markets expect G-SIBs to receive government support during financial crises, effectively lowering their funding costs. Confirmation of this hypothesis would suggest that instead of mitigating moral hazard, such assumptions may actually be reinforcing it.

Given the alternate hypotheses suggested above, the question of whether geopolitical risk increases or decreases default risk for G-SIBs as compared to non-G-SIBs warrants an empirical examination.

# 3. Data and Methodology

## 3.1 Data and Variables

Our dataset includes monthly observations for 46 banks, consisting of twenty-three (23) G-SIBs and 23 non-G-SIBs, which are the second largest banks after the G-SIBs, all from the same 10 countries. These observations span from January 2012 to November 2023 (Table 1).

[Insert Table 1 about here]

To analyze the relationship between geopolitical risk and default risk (measured by CDS spreads), we gather data from various sources. First, we obtain the individual bank-level CDS spread data for 23 G-SIBs and 23 non-G-SIBs from a Bloomberg Terminal. Five-year senior CDS instruments are taken since they have the highest liquidity and constitute 85% of the whole market (Cottrell et al., 2021). Daily stock prices and volatility, leverage, price-to-book ratios, stock market indices, market volatility, and government bond yield data are also collected from Bloomberg. The data is then merged with the Geopolitical Risk Index (GPR index) data developed by Caldara and Iacoviello (2022). We source inflation data for 10 countries from the World Development Indicators database provided by the World Bank. Finally, we incorporate the probability of default data from the Credit Research Initiative Database developed by the National University of Singapore. Appendix 1 presents the detailed definitions of the variables.

Table 1 presents the banks selected in our sample across G-SIBs and non-G-SIBs. To identify G-SIBs, we utilize the 2023 List of G-SIBs published by FSB on November 27, 2023. We collected monthly CDS and firm-specific data from a Bloomberg Terminal. The sample

encompasses 2739 bank-month observations 23 G-SIBs from and 2094 observations for non-G-SIBs across 10 countries from January 2012 to November 2023. The total number of observations is 4833. We exclude 6 G-SIBs from our sample due to a lack of consistent data. Excluded G-SIBs include Agricultural Bank of China, China Construction Bank, Bank of Communications, Groupe BPCE, Royal Bank of Canada, and State Street.

Table 2 presents a comparative analysis of summary statistics between G-SIBs and non-G-SIBs. It indicates that the mean CDS spread is higher for non-G-SIBs compared to G-SIBs. The mean value of global geopolitical risk, geopolitical threats, and geopolitical acts do not vary across the two categories since they are independent of banks. The mean stock return is 0.006 for non-G-SIBs and 0.003 for G-SIBs. Illiquidity, measured by the difference between bid-ask spread of CDS, is higher for non-G-SIBs on average compared to G-SIBs, indicating that CDS contracts for G-SIBs are more liquid. The idiosyncratic factors demonstrate a considerable amount of similarity between the two groups. Comparing the probability of default data reveals that, on average, G-SIBs exhibit higher mean values for both 1-year and 5-year probability of default compared to non-G-SIBs. For instance, the 5-year probability of default mean is 0.025 for G-SIBs, whereas it is 0.013 for non-G-SIBs.

[Insert Table 2 about here]

We follow the approach of Cottrell et al. (2021) and Benbouzid et al. (2017) who examine the determinants of default risk of banks. We take the first differences of the CDS spread as the dependent variable.

The primary independent variable of interest for this research is geopolitical risk. Caldara and Iacoviello (2022) developed a novel metric for gauging uncertainty associated with geopolitical events which is known as the GPR index. The GPR index is constructed by monitoring

the percentage of monthly news articles discussing adverse geopolitical events and their associated threats. Its modern iteration traces back to 1985 and relies on automated text searches across ten prominent newspapers: the Chicago Tribune, the Daily Telegraph, the Financial Times, the Globe and Mail, the Guardian, the Los Angeles Times, the New York Times, USA Today, the Wall Street Journal, and the Washington Post. Each month, the index tallies the number of articles addressing escalating geopolitical risks, dividing this figure by the total number of published articles for the same period. They categorize the search into eight distinct groups: War Threats (Category 1), Peace Threats (Category 2), Military Build-ups (Category 3), Nuclear Threats (Category 4), Terror Threats (Category 5), Beginning of War (Category 6), Escalation of War (Category 7), and Terror Acts (Category 8). Caldara and Iacoviello have also developed two subindexes based on these search categories. The Geopolitical Threats (GPRT) index encompasses words from categories 1 to 5, while the Geopolitical Acts (GPRA) index includes words from categories 6 to 8.

We use the global monthly GPR index, $GPR_t$ for our baseline analysis since our sample consists of G-SIBs and other large financial institutions capable of impacting the global banking sector in response to geopolitical risks. We employ bank-specific and macro-level control variables at the monthly frequency, similar to Cottrell et al. (2021) and Benbouzid et al. (2017).

### 3.2 Model

We examine the impact of geopolitical risk on the first difference of CDS spread of banks using the following baseline Ordinary Least Square (OLS) panel regression model:

$$\Delta CDS_{i,t} = \alpha + \beta_1 GPR_t + \beta_2 \text{Bank Controls}_{i,t} + \beta_3 \text{Macro Controls}_t + \lambda_i + \varepsilon_{i,t} \quad \ldots. (1)$$

$\Delta CDS_{i,t} = CDS_{i,t} - CDS_{i,t-1}$, where $\Delta CDS_{i,t}$ is the credit spread of a G-SIB, i at the last date of month t. Here i and t stand for bank, and month, respectively. Bank controls include stock return and monthly change in historical volatility, illiquidity, leverage, and P/B ratio. Macro $\text{Controls}_t$

include market-wide variables such as market return and the monthly change in spot rate, term structure slope, market volatility, and market return. We include inflation as additional macroeconomic variable. $\lambda_i$ is the firm fixed effect. $\varepsilon_{i,t}$ is the random error.

# 4. Empirical Results

### 4.1 Baseline regression result

To analyze the effect of geopolitical risk on bank CDS spreads, we perform a baseline OLS panel regression using our complete sample of G-SIBs and non-G-SIBs. The results of the baseline regression are shown in Table 3. Column 1 shows results without fixed effects. Column 2 shows the results with firm fixed effects. Here, higher values of CDS_Spread signify higher default risk. Thus, the positive and statistically significant coefficients of GPR_Global (0.179) in column 1 present evidence that an escalation in geopolitical risk results in higher default risk for banks. The coefficient associated with the global geopolitical risk is significant at a 1% level of significance. In column 2, after introducing firm-fixed effects, the coefficient of GPR_Global remains positive (0.106) and significant at the 1% level. Moreover, the signs of the control variables are consistent with those found in the study conducted by Cottrell et al. (2021). CDS spreads are significantly negatively associated with the P/B ratio in Column 2. Additionally, CDS spreads shows a significant positive relationship with illiquidity, as increased illiquidity risk can elevate CDS spreads. The impact of geopolitical risk on CDS spreads is statistically significant. In terms of economic significance, a one standard deviation increase in geopolitical risk is associated with an increase of 10.82% (=0.179*34.181/56.550) in CDS Spreads with no fixed effects, an increase of 6.4% with firm-fixed effects. The results are statistically significant at the 1% level. In our baseline and subsequent regression analyses, we exclude year-fixed effects since they are collinear with the

GPR index and subsume its impact. Our findings corroborate Hypothesis 1, indicating that an increase in geopolitical risk is associated with higher bank CDS spreads.

[Insert Table 3 about here]

**4.2 CDS spreads of G-SIBs versus non-G-SIBs: Univariate analysis**

In our study, we categorize 23 of the 46 banks from 10 different countries as G-SIBs, based on FSB's 2023 G-SIBs list released on November 27, 2023. G-SIBs must also comply with additional FSB criteria, such as maintaining enhanced capital reserves, meeting Total Loss-Absorbing Capacity requirements, executing resolution strategies, and fulfilling more rigorous regulatory standards, reflecting their significant impact on global banking (Cottrell et al., 2021). Conversely, our selection for non-G-SIBs comprises the subsequent largest banks within each country, totaling an additional 23 institutions.

A discernible disparity in average CDS spreads between G-SIBs and non-G-SIBs could signal varying market perceptions of risk and the potential advantages G-SIBs receive due to their systemic relevance. To investigate this, we have created a visual representation (Figure 1) that plots monthly average CDS spreads from January 2012 to November 2023. As depicted in Figure 1, G-SIBs have lower CDS spreads compared to non-G-SIBs over the study period. Although there was a brief period from January 2012 to January 2014 when non-G-SIBs appeared to have lower CDS spreads, data from 2014 to 2023 consistently show lower CDS spreads for G-SIBs.

[Insert Figure 1 about here]

To assess the statistical significance of the difference in CDS spreads between G-SIBs and non-G-SIBs, we conducted a univariate t-test. This test compares the average CDS spreads' sample means. Over the 12-year span, G-SIBs' average CDS spreads stand at 76.94 basis points, compared

to 84.78 basis points for non-G-SIBs, resulting in a 7.84 basis point higher average spread for the latter, as shown in Table 4. The period from January 2012 to January 2014 stands out as the only interval during which non-G-SIBs had a lower CDS spread, averaging 4.92 basis points less. Nonetheless, this difference is not statistically significant, with a p-value of 0.26 (Table 4, row 2). Table 4 presents the univariate t-test results for the periods from January 2014 to November 2023 (row 3) and from January 2016 to November 2023 (row 4), consistently showing higher CDS spreads for non-G-SIBs, with the gap widening over time. The p-values for these periods confirm that the CDS spread differences are statistically significant at the 1% level.

[Insert Table 4 about here]

To further explore how geopolitical risk affects CDS spreads between G-SIBs and non-G-SIBs, we conduct a cross-sectional analysis. We first focus on the 23 G-SIBs and re-run our baseline regression We perform the same analysis for the sample of non-G-SIB. Table 5 reports the results of the cross-sectional analysis of the CDS spread difference between G-SIBs and non-G-SIBs. Panel A presents the results for G-SIBs and Panel B reports the results for non-G-SIBs. Columns 1 and 2 in both Panel A and B present the result with no fixed effects, and firm-fixed effects only. The coefficients for GPR_Global are negative and statistically significant at a 1% level for G-SIBs, indicating a negative relationship between geopolitical risk and CDS spreads of G-SIBs. Results from Panel B demonstrate that geopolitical risk is associated with an increase in CDS spreads for non-G-SIBs. The coefficients are 0.292 and 0.164 in columns 1 and 2 respectively. The tests of coefficient equality are statistically significant at 1%. Overall, these results suggest support for Hypothesis 2B which posits that higher geopolitical risk will result in lower CDS spreads for G-SIBs compared to non-G-SIBs.

[Insert Table 5 about here]

The divergent effects observed for G-SIBs and non-G-SIBs indicate that during times of increased geopolitical risk, G-SIBs exhibit lower CDS spreads, which correlates with a decreased likelihood of default. This perceived funding benefit is likely due to the assumption that G-SIBs, given their systemic significance, are implicitly guaranteed providing them better access to liquidity, enhancing their stability amidst geopolitical volatility. Consequently, while geopolitical risk generally increases default risk for non-G-SIBs, it appears to reduce the default risk for G-SIBs, suggesting greater stability during periods of heightened volatility. To substantiate these observations from our subsample analysis, we conduct additional tests introducing an interaction term between geopolitical risk and G-SIB status in our regression model.

Specifically, we conduct an empirical analysis by estimating the following equation:

$$\Delta CDS_{i,t} = \alpha + \beta_1 GSIB_i * GPR_t + \beta_2 \text{Bank Controls}_{i,t} + \beta_3 \text{Macro Controls}_t + \lambda_i + \varepsilon_{i,t} \quad \ldots. (2)$$

The dependent variable is the first difference of CDS spreads. G-SIB is a dummy variable that assumes the value 1 if the bank is identified as a G-SIB, and 0 otherwise. The coefficient of interest is $\beta_1$**,** which indicates whether G-SIB designation has any differential impact on the relationship between geopolitical risk and default risk, relative to non-G-SIB banks. We include the same control variables used for the baseline regression. In addition, the specification includes bank fixed effects, $\lambda_i$, to control for unobserved structural differences between various banks under this study.

Table 6 presents the results analyzing the impact of G-SIB status on the relationship between geopolitical risk and default risk. Column 1 displays the results for Eq. (2), without fixed effects, while column 2 incorporates firm-fixed effects. Results from column 1, suggest a significant differential effect for G-SIBs relative to non-G-SIBs. The coefficient of interest $\beta_1$, is negative and statistically significant at the 1% level, meaning that an increase in geopolitical risk

leads to a lower default risk for G-SIBs as compared to non-G-SIBs. We find that G-SIB status reduces CDS spreads by 14.4%, relative to non-G-SIBs. After controlling for firm fixed effects, the coefficient remains significant at the 1% level, indicating a 16.2% decline in default risk for G-SIBs, as shown in column 2. This suggests a statistically significant differential impact of geopolitical uncertainty on default risk between G-SIBs and non-G-SIB banks.

[Insert Table 6 about here]

### 4.2 Difference-in-difference regression with two exogenous shocks: Russian annexation of Crimea and Paris attack

We enhance our identification strategy by considering two significant geopolitical events—the Russian annexation of Crimea in 2014 and the series of terrorist attacks in Paris in 2015— as potential exogenous shocks. These events provide the framework for a DiD analysis to explore the causal link between geopolitical risk and CDS spreads.

Research has shown that the CDS market reacts in distinct ways to banks designated as G-SIBs compared to non-G-SIBs. For example, Bijlsma et al. (2014) examined the CDS spreads of smaller European banks during the financial crisis, leveraging this data to project spreads for larger banks. The findings indicated a funding advantage of 67 basis points for larger European banks and 121 basis points for G-SIBs. Araten and Turner (2013) similarly highlighted a funding cost benefit for G-SIBs, particularly in CDS related to senior debt and domestic deposits, with G-SIBs experiencing an average funding cost 18 basis points lower than non-G-SIBs. We conduct a DiD analysis to examine if CDS spreads react differently for G-SIBs compared to non-G-SIBs following significant geopolitical events such as the annexation of Crimea and the Paris attacks. We categorize G-SIBs as the treatment group and non-G-SIBs as the control group, based on the FSB's 2023 G-SIB list. A 6-year window surrounding the geopolitical events is used to calculate

the average effect. This approach follows established methodologies by Degryse et al. (2023) and Behn and Schramm (2021), aiming to assess the impact of G-SIB status on banks' perceived default risk amid geopolitical tensions.

The following model is employed to perform the DiD test using the Russian annexation of Crimea and the Paris attack events:

$$\Delta CDS_{i,t} = \alpha + \beta_1 GSIB_i * POST_t + \beta_2 \text{Bank Controls}_{i,t} + \beta_3 \text{Macro Controls}_t + \lambda_i + \varepsilon_{i,t} \quad \ldots. (3)$$

Where $GSIB_i$ is a dummy variable and equals 1 for banks that are designated as and 0 otherwise. POST is an indicator variable that takes on the value 1 for 3 years following a specified event. The interaction term, $GSIB_i * POST_t$ is our variable of interest as it captures the impact of geopolitical risk on default risk for banks having G-SIB status. The coefficient of interest is β1 which indicates how G-SIBs differ in default risk following significant geopolitical events, compared to non-G-SIBS.

The results of our DiD analysis, presented in Table 7, suggest a causal relationship. It explores the differences in CDS spreads among banks and assesses the impact of G-SIB designation during the events of the Russian annexation of Crimea and the Paris attacks. We find that the coefficients for the interaction terms are negative and statistically significant at the 1% level, for both events. Our findings imply that G-SIBs experience a reduced default risk compared to non-G-SIBs, supporting our argument that G-SIBs are insulated from the adverse effects of geopolitical risk due to their TBTF status. Our DiD analysis suggests a causal link between geopolitical risk and differences in CDS spreads. The findings conclusively support Hypothesis 2B, indicating that geopolitical risk leads to lower CDS spreads for G-SIBs compared to non-G-SIBs. This also aligns with the profit-based reaction hypothesis.

[Insert Table 7 about here]

### 4.3 Robustness check: Alternative measure of default risk

To ensure the reliability of our default risk analysis, we conduct a robustness check using an alternate metric, the PD, provided by the CRI of the National University of Singapore. The CRI database aggregates credit event data from diverse sources, such as Bloomberg, Compustat, CRSP, Moody's, stock exchanges, and media outlets. The CRI offers PD estimates across different time spans, ranging from one month up to five years. In line with the approach adopted by Dewenter and Riddick (2018), we utilize the five-year default probability measure, CRI:PD:5, which assesses the default probability for a given month by integrating company-specific data with broader market information. Additionally, we use the one-year default probability measure, CRI:PD:1, due to its strong correlation with CRI:PD:5, evidenced by a correlation coefficient of 0.9123.

Table 8 presents the regression results using CRI:PD:1 and CRI:PD:5 as alternative default risk measures for both G-SIBs and non-G-SIBs. Panel A details the results for G-SIBs, while Panel B outlines the results for non-G-SIBs. The analysis reveals a positive coefficient (0.001) for geopolitical risk in non-G-SIBs, which is significant at the 10% level when employing CRI:PD:5 as the dependent variable. Conversely, for G-SIBs, geopolitical risk is associated with negative coefficients (-0.002), which are significant at the 5% level for both CRI:PD:1 and CRI:PD:5. These findings are consistent with our previous results, reinforcing the differential impact of geopolitical risk on the default probabilities of G-SIBs and non-G-SIBs.

[Insert Table 8 about here]

Having documented the differential effects of geopolitical risk on CDS spreads of G-SIBs and non-G-SIBs, following previous studies that highlight the distinct impacts of geopolitical threats and acts (Nguyen & Thuy, 2023; Phan et al., 2022), we delve deeper into the components of geopolitical risk—geopolitical threats and geopolitical acts—that may account for our findings.

Our analysis includes two subsamples: one focusing on geopolitical threats and the other on geopolitical acts. Table 9 shows the results of the subsample analysis with geopolitical threats and Table 10 reports the results with geopolitical acts. Panel A in both tables represents the results for G-SIBs and Panel B for non-G-SIBs. Our results reveal that geopolitical threats reduce CDS spreads more for G-SIBs than non-G-SIBs due to their TBTF status. Conversely, actual geopolitical events increase CDS spreads for both G-SIBs and non-G-SIBs, with a more pronounced effect on non-G-SIBs.

[Insert Table 9 about here]

[Insert Table 10 about here]

Thus, while G-SIBs might initially experience reduced default risk under the assumed TBTF protection amid threats, this perceived benefit wanes in the face of real geopolitical acts. Non-G-SIBs, which do not enjoy such implicit government backing, invariably face a heightened perception of risk and thus increased CDS spreads when geopolitical risks materialize. One possible explanation for these findings is that geopolitical acts, being concrete events, are often linked to heightened fears of further escalation and prolonged conflict (Caldara & Iacoviello, 2022). The tangible nature of geopolitical acts amplifies perceived risk and increases default risk for both G-SIBs and non-G-SIBs. For G-SIBs, while geopolitical threats might lower default risk due to the market's belief in a TBTF safety net, this implicit government guarantee is less effective in the face of actual geopolitical events. As a result, real geopolitical acts disrupt the expected TBTF protection, causing an increase in CDS spreads.

## 5. Conclusion

This paper examines the relationship between geopolitical uncertainty and the default risk of banks, as proxied by 5-year senior CDS spreads. Utilizing a unique dataset spanning from January 2012 to November 2023, we explore the impact of geopolitical risk, measured by the GPR index, on the default risk of 46 major banks across 10 countries. We document a positive relationship between geopolitical risk and CDS spreads, indicating that increased geopolitical risk leads to higher default risk for banks overall. Specifically, a one standard deviation increase in geopolitical risk is associated with a 6.4% to 10.82% rise in CDS spreads.

We further examine the impact of G-SIB status on default risk, motivated by the TBTF policy implications. Our univariate tests reveal that G-SIBs consistently demonstrate lower CDS spreads compared to non-G-SIBs. This difference is statistically significant and persists despite geopolitical uncertainties, suggesting an implicit government guarantee stemming from their systemic importance.

Our cross-sectional analysis sheds light on the varying effects of geopolitical risk on G-SIBs and non-G-SIBs. Intriguingly, we find that for G-SIBs, an uptick in geopolitical risk is associated with a decrease in CDS spreads, implying a market perception of a safety net that lowers their perceived default risk. In contrast, non-G-SIBs experience an increase in default risk as geopolitical risk intensifies. This dichotomy is supported by regression analyses that reveal a significant negative coefficient for G-SIBs, indicating a reduction in default risk, and a positive coefficient for non-G-SIBs, indicating an increase in default risk.

Further evidence comes from a DiD analysis centered on major geopolitical events, which demonstrates that G-SIBs benefit from lower CDS spreads compared to non-G-SIBs in the aftermath of such events, reinforcing the TBTF advantage. Robustness checks with alternative

measures of default risk, like the Probability of Default, corroborate these findings. For non-G-SIBs, geopolitical risk has a direct and positive impact on default risk, whereas for G-SIBs, the impact is inversely related, aligning with the TBTF hypothesis. Delving deeper, we differentiate between geopolitical threats and acts, finding that threats tend to lower CDS spreads for G-SIBs more than the non-G-SIBs, while actual geopolitical acts lead to higher CDS spreads for both bank categories, with non-G-SIBs feeling a more significant impact.

The study indicates that G-SIBs benefit from lower default risk during high geopolitical risk, possibly due to TBTF perceptions and higher capital reserves. However, this may lead to increased moral hazard, with G-SIBs potentially engaging in riskier practices, expecting government bailouts in crises. Future research could explore whether G-SIBs' reduced lending to risky firms persists in such risky periods. Furthermore, the trend of banks becoming "too big to save" suggests that large banks in financially strained countries may face limited bailout options, as seen in the European Commission's downsizing mandate for major banks after the financial crisis to maintain competitive fairness and reduce moral hazard (Demirgüç-Kunt & Huizinga, 2013).

Policymakers must address these moral hazard issues to mitigate systemic risks and ensure financial stability. They should also strengthen crisis preparedness and risk management framework in the face of geopolitical risks due to the unpredictable nature of such uncertainty shocks.

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**Figure 1.** CDS Spreads

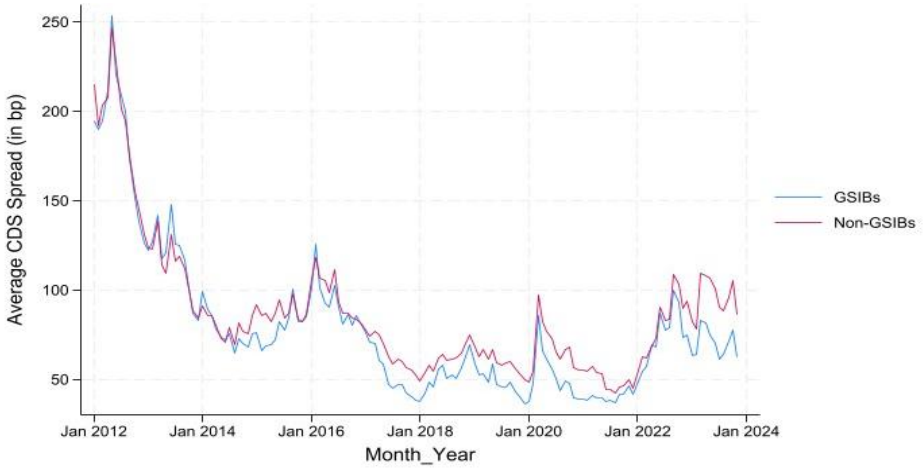


**Figure 1.** Time trend of average CDS spread for G-SIBs and non-G-SIBs

**Table 1: Sample Distribution**

| Country | G-SIBs | Non-G-SIBs |
|---|---|---|
| Britain | Barclays | Lloyds Banking Group |
| | Hongkong and Shanghai Banking Corporation Limited (HSBC) | NatWest Group United Kingdom |
| | Standard Chartered Bank (SCB) | Santander UK |
| Canada | Toronto Dominion | The Bank of Nova Scotia |
| | | Bank of Montreal |
| | | Canadian Imperial Bank of Commerce |
| China | Bank of China | China Merchants Bank |
| | Industrial and Commercial Bank of China | |
| France | BNP Paribas | AXA Banque |
| | Group Credit Agricole | Natixis Bank |
| | Societe Generale | |
| Germany | Deutsche Bank | Commerzbank Germany |
| Japan | Mitsubishi UFG FG | Norinchukin Bank |
| | Mizuho FG | |
| | Sumitomo Mitsui FG | |
| Netherlands | ING Bank | ABN Amro |
| Spain | Santander Bank | Caixabank |
| | | Banco Bilbao Vizcaya Argentaria |
| Switzerland | Union Bank of Switzerland (UBS) | Raiffeisen Schweiz |
| US | Bank of America | U.S Bancorp |
| | Bank of New York Mellon | PNC Financial Group US |
| | Citigroup | Capital One |
| | Goldman Sachs | First Citizens Bank |
| | JP Morgan Chase | American Express |
| | Morgan Stanley | Ally Financial |
| | Wells Fargo | Charles Schwab Corporation |
| | | Truist Financial |

**Table 2: Summary statistics**

| Variables | G-SIBs | | | | Non-G-SIBS | | | |
|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | Median | Std. Dev. | Obs | Mean | Median | Std. Dev. |
| CDS Spread (bp) | 2739 | 76.938 | 62.86 | 51.336 | 2094 | 79.755 | 59.960 | 59.487 |
| Δ CDS Spread | 2739 | -1.198 | -0.68 | 39.268 | 2094 | -0.578 | -0.287 | 32.053 |
| GPR_Global | 2739 | 100.050 | 91.460 | 34.181 | 2094 | 100.050 | 91.460 | 34.181 |
| GPR_Threat | 2739 | 114.536 | 101.260 | 48.105 | 2094 | 114.536 | 101.260 | 48.105 |
| GPR_Act | 2739 | 83.363 | 76.340 | 35.812 | 2094 | 83.363 | 76.340 | 35.812 |
| Stockreturn | 2739 | 0.003 | 0.004 | 0.005 | 2094 | 0.005 | 0.009 | 0.007 |
| Volatility | 2739 | 0.302 | 0.265 | 0.130 | 2094 | 0.319 | 0.281 | 0.142 |
| Illiquidity | 2739 | 0.069 | 0.051 | 0.046 | 2094 | 0.112 | 0.099 | 0.090 |
| Leverage_ratio | 2739 | 0.057 | 0.058 | 0.015 | 2094 | 0.061 | 0.060 | 0.013 |
| P/B ratio | 2739 | 0.008 | 0.007 | 0.036 | 2094 | 0.012 | 0.009 | 0.009 |
| Spot | 2739 | 0.014 | 0.014 | 0.012 | 2094 | 0.014 | 0.015 | 0.011 |
| Slope | 2739 | 0.008 | 0.007 | 0.006 | 2094 | 0.121 | 0.008 | 0.446 |
| Marketreturn | 2739 | 0.002 | 0.0006 | 0.005 | 2094 | 0.015 | 0.015 | 0.049 |
| Marketvol | 2739 | 0.180 | 0.166 | 0.070 | 2094 | 0.186 | 0.158 | 0.081 |
| Inflation | 2739 | 0.020 | 0.016 | 0.021 | 2094 | 0.020 | 0.016 | 0.021 |
| CRI:PD:1 | 2739 | 0.004 | 0.0017 | 0.009 | 2094 | 0.002 | 0.0007 | 0.003 |
| CRI:PD:5 | 2739 | 0.025 | 0.015 | 0.029 | 2094 | 0.013 | 0.009 | 0.011 |

Note: This table reports the summary statistics of all the variables used for the empirical study. G-SIBs stand for global systemically important banks and non-G-SIBs are the other large banks from 10 countries. Our sample includes 2739 bank year observations for G-SIBs and 2094 observations for non-G-SIBs. Data cover the period of January 2012 to November 2023.

**Table 3: Baseline Regression results.** This table reports the baseline results from the panel regression analysis. GPR_Global is the monthly global geopolitical risk index. CDS_Spread is the first difference of 5-year maturity Credit Default Swap spread of 46 banks. The sample comprises 4833 observations from the period of January 2012 to November 2023. Standard errors are reported in parentheses. ∗∗∗, ∗∗, and ∗ denote significance at the 1%, 5%, and 10% level, respectively.

| VARIABLES | (1)<br>CDS_Spread | (2)<br>CDS_Spread |
|---|---|---|
| GPR _Global | 0.179*** | 0.106*** |
| | (0.042) | (0.038) |
| Stockreturn | -16.648*** | -21.586*** |
| | (1.256) | (2.709) |
| ΔVolatility_180 | -0.253 | -0.170 |
| | (0.417) | (0.373) |
| Δ Illiquidity | 0.665*** | 0.615*** |
| | (0.258) | (0.229) |
| Δ Leverage_ratio | -0.543 | -0.558 |
| | (1.208) | (1.074) |
| Δ P/B ratio | -2.415 | -0.425 |
| | (8.676) | (7.759) |
| Δ Spot | -9.468** | -8.633** |
| | (3.845) | (3.428) |
| Δ Slope | -0.329 | -0.180 |
| | (0.578) | (0.514) |
| Marketreturn | 0.008 | -5.789*** |
| | (0.236) | (0.907) |
| Δ Marketvol | -0.521 | -0.532 |
| | (0.614) | (0.548) |
| Inflation | 0.084 | 1.314*** |
| | (0.434) | (0.440) |
| Constant | 60.174*** | 80.981*** |
| | (3.196) | (5.609) |
| Observations | 4,833 | 4,833 |
| R-squared | 0.045 | 0.253 |
| Firm FE | No | Yes |

**Table 4: Univariate test** - Difference in the mean of CDS spreads between G-SIBs and Non-G-SIBs

| Variable of interest | No. of obs.(Non-G-SIBs) | No. of obs. (G-SIBs) | Mean (1) (Non-G-SIBs) | Mean (2) (G-SIBs) | Mean(1)-Mean(2) | St Err | t-value | p-value |
|---|---|---|---|---|---|---|---|---|
| CDS Spread (January 2012-November 2023) | 2455 | 3056 | 84.776 | 76.938 | 7.838 | 1.53 | 5.15 | 0.00 |
| CDS Spread (January 2012-January 2014) | 459 | 699 | 132.406 | 126.885 | 5.522 | 4.915 | 1.1 | .262 |
| CDS Spread (January 2014-November 2023) | 2164 | 2597 | 74.364 | 63.503 | 10.861 | 1.095 | 9.9 | 0.00 |
| CDS Spread (January 2016-November 2023) | 1828 | 2114 | 72.445 | 60.18 | 12.265 | 1.179 | 10.4 | 0.00 |

Note: The table shows the variable of interest, credit default swap spread (CDS spread), and the cost of wholesale debt funding at the end of each month. The second row provides the univariate tests of differences in CDS spread between G-SIBs and non-G-SIBs groups for the whole period. Row 3 reports results for the period of CDS Spread January 2012-January 2014. Rows 4 and 5 present the results for the period of January 2014- November 2023 and January 2016- November 2023, respectively. All variables are defined in Appendix A. ∗∗∗, ∗∗, and ∗ denote statistical significance at the 1%, 5%, and 10% levels, respectively.

**Table 5: CDS Spread difference.** This table reports the results from the subsample analysis of CDS spread difference between G-SIBs and non-G-SIBs. Panel A and Panel B present the results associated with G-SIBs and non-G-SIBs, respectively. GPR_Global is the monthly global geopolitical risk index. CDS Spread is the first difference of 5-year maturity Credit Default Swap spread of 23 G-SIBs and 23 non-G-SIBs. The sample comprises observations from the period of January 2012 to November 2023. We include some bank-level and macroeconomic control variables. Both panels include firm-fixed effects. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

| | Panel A | | Panel B | |
|---|---|---|---|---|
| VARIABLES | (1) CDS Spread | (2) CDS Spread | (1) CDS Spread | (2) CDS Spread |
| GPR _Global | -0.198*** | -0.161*** | 0.292*** | 0.164*** |
| | (0.032) | (0.029) | (0.066) | (0.058) |
| Stockreturn | -2.520 | 9.417** | -19.704*** | -11.328*** |
| | (1.885) | (4.044) | (1.788) | (3.704) |
| ΔVolatility_180 | -1.331** | -1.089** | 1.099* | 1.334** |
| | (0.534) | (0.474) | (0.620) | (0.530) |
| Δ Illiquidity | 0.065 | 0.141 | 0.814** | 0.766*** |
| | (0.401) | (0.355) | (0.337) | (0.286) |
| Δ Leverage_ratio | -0.132 | -0.163 | -1.014 | -5.063 |
| | (1.101) | (0.974) | (6.570) | (5.589) |
| Δ P/B ratio | -24.625 | -27.619** | 6.325 | 4.654 |
| | (15.048) | (13.382) | (10.841) | (9.264) |
| Δ Spot | -13.611** | -12.610** | -3.676 | -3.108 |
| | (5.683) | (5.058) | (5.938) | (5.051) |
| Δ Slope | 1.763 | 1.610 | -0.547 | -0.509 |
| | (8.075) | (7.170) | (0.616) | (0.523) |
| Marketreturn | -31.258*** | -72.256*** | 0.070 | -0.503 |
| | (1.873) | (2.917) | (0.259) | (0.957) |
| Δ Marketvol | 0.880 | 0.353 | -1.918** | -2.006** |
| | (0.787) | (0.700) | (0.921) | (0.784) |
| Inflation | 6.194*** | 8.611*** | -1.121* | 0.141 |
| | (0.603) | (0.607) | (0.677) | (0.650) |
| Constant | 90.469*** | 107.895*** | 57.358*** | 37.104*** |
| | (3.196) | (5.543) | (5.037) | (6.108) |
| Observations | 2,739 | 2,739 | 2,094 | 2,094 |
| R-squared | 0.127 | 0.322 | 0.083 | 0.347 |
| Firm FE | No | Yes | No | Yes |
| Chi-square | 55.19 | | | |
| Prob>chi2 | 0.00 | | | |

**Table 6: Effect of G-SIB status on default risk.** This table reports the estimation results for wholesale funding and investigates the impact of banks' G-SIB status. The dummy variable G-SIB takes the value of 1 if the bank is identified as a G-SIB, and 0 otherwise. GPR_Global is the monthly global geopolitical risk index. CDS_Spread is the first difference of 5-year maturity Credit Default Swap spread of 23 G-SIBs and 23 non-G-SIBs. The sample comprises 4833 observations from the period of January 2012 to November 2023. We include some bank-level and macroeconomic control variables. Column 1 doesn't include year and firm fixed effects. Column 2 includes firm fixed effects and Column 3 includes firm fixed effects. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

| | (1) | (2) |
|---|---|---|
| VARIABLES | CDS_Spread | CDS_Spread |
| GPR _Global | -0.050 | -0.102*** |
| | (0.036) | (0.033) |
| GSIB | 2.262 | -6.714 |
| | (4.820) | (8.422) |
| GSIB*GPR | -0.144*** | -0.162*** |
| | (0.033) | (0.030) |
| Stockreturn | -18.234*** | -22.172*** |
| | (1.269) | (2.698) |
| ΔVolatility_180 | -0.031 | 0.087 |
| | (0.417) | (0.372) |
| Δ Illiquidity | 0.611** | 0.562** |
| | (0.257) | (0.229) |
| Δ Leverage_ratio | -0.467 | -0.435 |
| | (1.206) | (1.071) |
| Δ P/B ratio | -6.309 | -4.100 |
| | (8.662) | (7.744) |
| Δ Spot | -7.385* | -6.861** |
| | (3.841) | (3.421) |
| Δ Slope | -0.452 | -0.299 |
| | (0.577) | (0.513) |
| Marketreturn | -0.136 | -6.010*** |
| | (0.240) | (0.905) |
| Δ Marketvol | -0.408 | -0.481 |
| | (0.613) | (0.546) |
| Inflation | 1.400*** | 2.911*** |
| | (0.454) | (0.456) |
| Constant | 80.269*** | 108.864*** |
| | (3.623) | (5.553) |
| Observations | 4,833 | 4,833 |
| R-squared | 0.049 | 0.257 |
| Firm FE | No | Yes |

**Table 7: Difference-in-difference test.** This table reports the estimation results for the difference-in-difference analysis. GSIB is the treatment group, an indicator variable that takes the value of 1 if the bank is identified as a GSIB, and 0 otherwise. $POST_{t=2014}$ and $POST_{t=2015}$ are dummy variables equal to 1 if it is one to three years post-annexation of Crimea in 2014 and the Paris attack in 2015, respectively, and 0 otherwise. Columns 1 and 2 report the results associated with the exogenous shocks i.e., the Russian conflict and the Paris attack, respectively. CDS_Spread is the first difference of 5-year maturity Credit Default Swap spread. The sample comprises observations from the period of January 2012 to November 2023. We include some bank-level and macroeconomic control variables. Both models include firm fixed effects. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

| VARIABLES | (1) CDS_Spread | (2) CDS_Spread |
|---|---|---|
| $GSIB*POST_{t=2014}$ | -15.023*** | - |
| | (4.422) | |
| $GSIB*POST_{t=2015}$ | - | -6.368** |
| | | (2.806) |
| Stockreturn | -61.028*** | -39.583*** |
| | (8.458) | (4.208) |
| ΔVolatility_180 | 1.673*** | 0.508 |
| | (0.629) | (0.433) |
| Δ Illiquidity | 0.748*** | 0.648*** |
| | (0.265) | (0.233) |
| Δ Leverage_ratio | -0.840 | 0.030 |
| | (1.380) | (1.017) |
| Δ P/B ratio | -45.515*** | -4.594 |
| | (14.140) | (9.039) |
| Δ Spot | -10.874** | -2.811 |
| | (5.173) | (3.986) |
| Δ Slope | -0.336 | 0.907 |
| | (1.047) | (0.669) |
| Marketreturn | -7.483*** | 1.496* |
| | (1.526) | (0.856) |
| Δ Marketvol | -6.970*** | -2.550*** |
| | (1.058) | (0.716) |
| Inflation | 12.211*** | -1.104 |
| | (1.518) | (0.945) |
| Constant | 165.078*** | 114.892*** |
| | (8.161) | (4.798) |
| Observations | 1,869 | 2,378 |
| R-squared | 0.634 | 0.532 |
| Firm FE | Yes | Yes |

**Table 8: Empirical analysis with an alternative measure of default risk.** Column 1 and Column 2 of this table report the results for the relationship between default risk, as measured by CRI:PD, and geopolitical risk for G-SIBs and non-G-SIBs, respectively. We present the results for the National University of Singapore Credit Research Initiative (CRI) probability of default measure, CRI:PD:1 and CRI:PD:5, for a one and five-year horizon, monthly data. The sample includes 23 banks from 10 countries designated G-SIBs, and 23 more banks from the same countries that do not have G-SIBs status: the non-G-SIBs, covering the period from January 2012 to November 2023. We incorporate various bank-level and macroeconomic control variables. Both models account for firm fixed effects, year fixed effects and standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

| | Panel A | | Panel B | |
|---|---|---|---|---|
| VARIABLES | (1)<br>CRI:PD:1 | (2)<br>CRI:PD:5 | (1)<br>CRI:PD:1 | (1)<br>CRI:PD:5 |
| GPR _Global | -0.002** | -0.002** | 0.001 | 0.001* |
| | (0.001) | (0.001) | (0.001) | (0.000) |
| Stockreturn | -1.757*** | -0.667*** | -1.351*** | -0.560*** |
| | (0.071) | (0.041) | (0.063) | (0.027) |
| ΔVolatility_180 | 0.028* | 0.001 | 0.024 | 0.000 |
| | (0.016) | (0.009) | (0.022) | (0.009) |
| Δ Illiquidity | -0.011 | -0.003 | 0.013 | 0.003 |
| | (0.011) | (0.007) | (0.012) | (0.005) |
| Δ Leverage_ratio | -0.004 | 0.002 | -0.183 | -0.011 |
| | (0.032) | (0.018) | (0.225) | (0.097) |
| Δ P/B ratio | -1.525*** | -0.547* | -0.354 | -0.090 |
| | (0.488) | (0.282) | (0.357) | (0.154) |
| Δ Spot | -0.041 | 0.174 | -0.185 | -0.037 |
| | (0.207) | (0.119) | (0.249) | (0.108) |
| Δ Slope | 0.149 | -0.201 | 0.001 | 0.006 |
| | (0.257) | (0.148) | (0.019) | (0.008) |
| Marketreturn | -0.292*** | -0.124*** | 0.064*** | 0.045*** |
| | (0.056) | (0.033) | (0.008) | (0.003) |
| Δ Marketvol | -0.047** | -0.008 | -0.021 | -0.004 |
| | (0.023) | (0.014) | (0.031) | (0.013) |
| Inflation | -0.020 | -0.033*** | 0.151*** | 0.076*** |
| | (0.022) | (0.012) | (0.033) | (0.014) |
| Constant | -6.854*** | -4.131*** | -8.163*** | -5.064*** |
| | (0.100) | (0.075) | (0.115) | (0.050) |
| Observations | 2,097 | 2,097 | 1,463 | 1,463 |
| R-squared | 0.282 | 0.155 | 0.295 | 0.321 |
| Firm FE | Yes | Yes | Yes | Yes |

**Table 9: Subsample analysis using geopolitical threat.** This table reports the results from the subsample analysis using geopolitical threats. Panel A and Panel B present the results associated with G-SIBs and non-G-SIBs, respectively. GPR_Threats is the monthly global geopolitical threat index. CDS Spread is the first difference of 5-year maturity Credit Default Swap spread of 23 G-SIBs and 23 non-G-SIBs. The sample comprises observations from the period of January 2012 to November 2023. We include some bank-level and macroeconomic control variables. Both panels include firm-fixed effects. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

| | Panel A | | Panel B | |
|---|---|---|---|---|
| | (1) | (2) | (1) | (2) |
| VARIABLES | CDS_Spread | CDS_Spread | CDS_Spread | CDS_Spread |
| GPR_Threat | -0.304*** | -0.226*** | -0.038 | -0.133*** |
| | (0.023) | (0.022) | (0.046) | (0.040) |
| Stockreturn | -3.365* | 7.776* | -20.418*** | -12.713*** |
| | (1.843) | (3.991) | (1.798) | (3.683) |
| ΔVolatility_180 | -0.957* | -0.843* | 1.277** | 1.569*** |
| | (0.522) | (0.468) | (0.623) | (0.530) |
| Δ Illiquidity | -0.067 | 0.043 | 0.821** | 0.755*** |
| | (0.392) | (0.350) | (0.339) | (0.286) |
| Δ Leverage_ratio | -0.078 | -0.124 | 0.971 | -3.081 |
| | (1.075) | (0.961) | (6.601) | (5.589) |
| Δ P/B ratio | -32.594** | -32.649** | 3.054 | 2.017 |
| | (14.711) | (13.201) | (10.884) | (9.258) |
| Δ Spot | -9.895* | -10.744** | -1.376 | -1.385 |
| | (5.526) | (4.967) | (5.957) | (5.043) |
| Δ Slope | -6.256 | -3.258 | -0.665 | -0.634 |
| | (7.864) | (7.051) | (0.619) | (0.523) |
| Marketreturn | -29.760*** | -67.889*** | 0.136 | -0.643 |
| | (1.830) | (2.906) | (0.260) | (0.956) |
| Δ Marketvol | 0.856 | 0.354 | -1.673* | -1.804** |
| | (0.769) | (0.690) | (0.925) | (0.784) |
| Inflation | 8.122*** | 9.911*** | 0.242 | 2.040*** |
| | (0.604) | (0.607) | (0.738) | (0.691) |
| Constant | 100.746*** | 112.138*** | 81.108*** | 59.437*** |
| | (2.597) | (5.218) | (4.409) | (5.573) |
| Observations | 2,739 | 2,739 | 2,094 | 2,094 |
| R-squared | 0.166 | 0.341 | 0.075 | 0.348 |
| Firm FE | No | Yes | No | Yes |
| Chi-square | 27.73 | | | |
| Prob>chi2 | 0.00 | | | |

**Table 10: Subsample analysis using geopolitical act.** This table reports the results from the subsample analysis using geopolitical acts. Panel A and Panel B present the results associated with G-SIBs and non-G-SIBs, respectively. GPR_Acts is the monthly global geopolitical acts index. CDS Spread is the first difference of 5-year maturity Credit Default Swap spread of 23 G-SIBs and 23 non-G-SIBs. The sample comprises observations from the period of January 2012 to November 2023. We include some bank-level and macroeconomic control variables. Both panels include firm-fixed effects. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

| | Panel A | | Panel B | |
|---|---|---|---|---|
| | (1) | (2) | (1) | (2) |
| VARIABLES | CDS_Spread | CDS_Spread | CDS_Spread | CDS_Spread |
| GPR _Act | 0.176*** | 0.103*** | 0.416*** | 0.350*** |
| | (0.028) | (0.025) | (0.050) | (0.044) |
| Stockreturn | -2.286 | 9.138** | -19.528*** | -8.204** |
| | (1.883) | (4.056) | (1.765) | (3.675) |
| ΔVolatility_180 | -1.690*** | -1.373*** | 1.169* | 1.354*** |
| | (0.532) | (0.474) | (0.612) | (0.522) |
| Δ Illiquidity | 0.192 | 0.242 | 0.776** | 0.740*** |
| | (0.401) | (0.356) | (0.333) | (0.283) |
| Δ Leverage_ratio | -0.251 | -0.248 | -1.943 | -5.982 |
| | (1.100) | (0.977) | (6.491) | (5.514) |
| Δ P/B ratio | -17.353 | -22.182* | 7.447 | 5.328 |
| | (15.008) | (13.390) | (10.707) | (9.138) |
| Δ Spot | -25.083*** | -19.795*** | -6.337 | -5.533 |
| | (5.679) | (5.075) | (5.879) | (4.994) |
| Δ Slope | 17.952** | 12.388* | -0.573 | -0.519 |
| | (8.004) | (7.136) | (0.608) | (0.516) |
| Marketreturn | -28.943*** | -69.769*** | 0.054 | -0.306 |
| | (1.892) | (2.984) | (0.256) | (0.945) |
| Δ Marketvol | 0.654 | 0.231 | -1.865** | -2.013*** |
| | (0.787) | (0.701) | (0.909) | (0.774) |
| Inflation | 4.244*** | 6.811*** | -0.871 | -0.274 |
| | (0.572) | (0.583) | (0.634) | (0.606) |
| Constant | 59.481*** | 86.245*** | 54.110*** | 27.334*** |
| | (2.664) | (5.450) | (3.441) | (5.218) |
| Observations | 2,739 | 2,739 | 2,094 | 2,094 |
| R-squared | 0.128 | 0.318 | 0.104 | 0.364 |
| Firm FE | No | Yes | No | Yes |
| Chi-square | 20.41 | | | |
| Prob>chi2 | 0.00 | | | |

## Appendix 1

### Variable Definition

| Variable | Definition | Source |
|---|---|---|
| CDS | Monthly credit default swap spread | Bloomberg Terminal |
| ΔCDS | The first difference of the CDS spread | Bloomberg Terminal |
| GPR_Global | Monthly global geopolitical risk index | (Caldara & Iacoviello, 2022) |
| GPR_Threat | Monthly global geopolitical threat index | (Caldara & Iacoviello, 2022) |
| GPR_Act | Monthly global geopolitical act index | (Caldara & Iacoviello, 2022) |
| Control Variables | | |
| Stock Return | Individual stock return over a 180-day window | Bloomberg Terminal |
| Volatility | Individual historical volatility of the annualized stock return over a 180-day window | Bloomberg Terminal |
| Illiquidity | The bid-ask spread of CDS quotes at the end of the month | Bloomberg Terminal |
| Leverage | The leverage ratio of the banks at the end of the month | Bloomberg Terminal |
| P/B ratio | The daily price-to-book ratio of the banks at the end of the month | Bloomberg Terminal |
| Spot | 10-year treasury yield rate at the end of the month for each country | Bloomberg Terminal |
| Slope | Term structure slope at the end of the month, the difference between 10-year treasury yield rate and 2-year treasury yield rate | Bloomberg Terminal |
| Market Return | Annualized return of the corresponding market index, ASX-200 over 180-day window | Bloomberg Terminal |
| Market Volatility | Historical volatility of the annualized ASX-200 returns over a 180-day window | Bloomberg Terminal |
| CRI:PD:1 | Monthly CRI:PD probability of default values, for a one-year horizon | Credit Research Initiative at National University of Singapore |
| CRI:PD:5 | Monthly CRI:PD probability of default values, for a five-year horizon | Credit Research Initiative at National University of Singapore |
| Inflation | Annual headline consumer price inflation | WDI from the World Bank |