
Staff Memo

# The transmission of geopolitical shocks to bank lending in Sweden: Evidence from Russia's full-scale invasion of Ukraine

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# Summary[1]

This memo studies how Swedish banks adjusted credit supply after Russia's full-scale invasion of Ukraine. Using loan-level data and bank-level measures of geopolitical risk exposure, it finds that credit expanded overall but was reallocated away from energy-intensive and financially vulnerable firms, with banks more exposed to geopolitical risk tightening lending more aggressively.

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# Sammanfattning på svenska

Detta memo undersöker hur svenska banker anpassade kreditutbudet efter den ryska *fullskaliga* invasionen av Ukraina. Med hjälp av data på lån och mått på bankernas exponering mot geopolitisk risk visar studien att kreditgivningen överlag ökade, men omfördelades bort från energiintensiva och finansiellt sårbara företag. Banker med högre exponering mot geopolitisk risk stramade dessutom åt utlåningen i större utsträckning jämfört med andra banker.

# 1 Introduction

This memo presents new empirical evidence on Swedish banks' exposure to geopolitical risk, with particular attention to how Russia's full-scale invasion of Ukraine affected credit supply to Swedish firms.

Geopolitical risk refers to the economic and financial consequences of geopolitical events and tensions (Caldara and Iacoviello, 2022).[2] Recent work suggests that such risks can tighten financial conditions, raise risk premia, weaken loan growth, and reduce expected output, especially in more open or otherwise vulnerable economies (ECB and ESRB, 2026; Hodula et al., 2024). Geopolitical risk is therefore increasingly viewed as an important source of financial stability risk in a more fragmented global environment (ECB and ESRB, 2026; IMF, 2025).

Geopolitical risks affect the financial system through several channels. In financial markets, they raise risk premia and disrupt capital flows (Caldara and Iacoviello, 2022; Metiu, 2025). In the real economy, sanctions and trade barriers can reduce trade and weaken firms' cash flows (Aiyar et al., 2023). They may also affect operational resilience by disrupting payment systems and critical infrastructure. For banks, the effects are often heterogeneous, reflecting differences in capitalization, funding structure, and exposure to affected regions or sectors (Avril et al., 2025; Behn et al., forthcoming). In small open economies such as Sweden, where banks play a central role in corporate financing, geoeconomic shocks can have significant implications for both credit supply and financial stability.

Russia's full-scale invasion of Ukraine, which led to a sharp increase in geopolitical risk,[3] represented a significant macro-financial shock for the Swedish banking sector, primarily through indirect channels such as energy prices, inflation, and financial market volatility rather than through direct exposures (Sveriges Riksbank, 2022:1; 2022:2). At the same time, Swedish banks maintain substantial exposures to the Nordic and Baltic region, raising concerns about indirect spillovers. Against this background, the analysis in this memo draws on Sweden's credit database (KRITA)[4] to assess whether, and if so how, banks' exposure to the geopolitical risks arising from Russia's full-scale invasion of Ukraine translated into changes in credit supply to Swedish firms.

[2] Rather than refereeing to geopolitical risk, studies such as ECB and ESRB (2026) employ the term *geoeconomic risk* to discuss the economic and financial consequences of geopolitical tensions (Caldara and Iacoviello, 2022) *and* economic policy uncertainty (Baker et al., 2016). As a matter of fact, economic policy uncertainty (EPU) may also affect financial conditions, although typically through a more gradual transmission mechanism that weighs on investment, credit growth, and firms and consumers' confidence. While the implications of economic policy uncertainty are also important, this study focuses solely on credit supply developments following Russia's full-scale invasion of Ukraine in 2022. Further analysis of more recent events is planned as a follow-up to this work.

[3] See Figure 1.A in the Appendix for details.

[4] KRITA is a credit database constructed by Statistics Sweden (SCB) on behalf of Sveriges Riksbank. It contains monthly information on loans to businesses and the public sector, reported by 25 monetary financial institutions. The database covers around 95 percent of all loans to the Swedish corporate sector. KRITA is the Swedish equivalent of the euro area credit database, AnaCredit, and closely follows its data structure and variable definitions.

The memo first documents aggregate credit dynamics following Russia's full-scale invasion of Ukraine in February 2022. It then analyses how credit outcomes differed across three dimensions: firms more directly exposed to the initial shock, financially vulnerable firms, and banks with varying exposure to geopolitical risk. To study the latter, I construct bank-level exposure measures based on the sensitivity of bank stock returns to the global GPR index of Caldara and Iacoviello (2022). This framework makes it possible to test whether banks with greater pre-invasion exposure to geopolitical risk adjusted their lending more strongly after the shock.

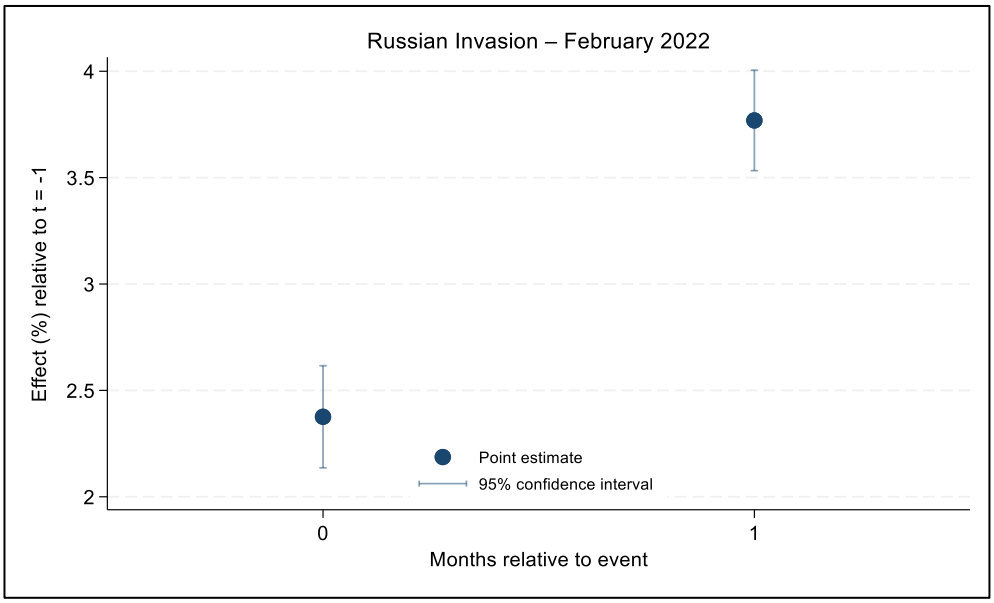
Overall, the results point to a selective reallocation of credit away from more exposed sectors and financially vulnerable firms, particularly by banks with higher pre-existing geopolitical risk exposure.

# 2 Bank lending following Russia's full-scale invasion of Ukraine

This section examines how banks adjusted lending to Swedish non-financial firms after Russia's full-scale invasion of Ukraine. The main results are shown in Figure 1 which summarizes the short-run lending response following the invasion. Descriptive statistics for the main variables are shown in Table 1.A in the Appendix. The analysis, in this section and throughout the memo, uses monthly credit data from the KRITA database to track lending within firm–bank relationships over time, while controlling for macroeconomic conditions, bank balance-sheet characteristics, and persistent differences across banks, firms, and years.

Figure 1 shows how outstanding term loan volumes changed immediately after Russia's full-scale invasion of Ukraine with respect to the month immediately before. It compares lending in the event month ($t = 0$) and one month later ($t = 1$), relative to the month immediately before the invasion ($t = -1$). The dots represent the coefficients of estimates based on an event-study specification with bank–group and firm–bank fixed effects, together with lagged lending contract characteristics, macroeconomic variables and firm-level controls.

**Figure 1: Short-run lending response to Russia's full-scale invasion of Ukraine**




Note: The figure plots event-study estimates of changes in outstanding term loan volumes around Russia's full-scale invasion of Ukraine. Dots represent point estimates and vertical bars denote 95 percent confidence intervals. Effects are expressed in percentage terms relative to the month immediately preceding the invasion (t = −1). The event month is February 2022 (t = 0), and t = 1 denotes the month following the invasion. All regressions include firm, bank–group, firm–bank and year fixed effects, errors are clustered at the firm–bank level.
Sources: KRITA, Bisnode-Serrano, Macrobond, S&P Capital IQ.

Figure 1 shows that, relative to the month immediately preceding the invasion, loan volumes rise by approximately 2.4 percent in the invasion month and by about 3.8 percent one month after, both estimates are statistically significant.[5] However, as the ECB and ESRB (2026) report highlights, firms', sectors', and institutions' exposure to geopolitical risk may also have influenced how credit was allocated. Then, aggregate credit growth may have masked important differences in the allocation of credit across firms and industries. The analysis below examines this possibility by first focusing on energy-intensive sectors, which were especially exposed to the sharp rise in energy prices, and then by looking at differences across sectors and firms' vulnerabilities. Then, using a novel approach in the existing literature, it also examines whether banks' pre-invasion stock market sensitivity to geopolitical risk shaped their response to the shock, in line with evidence that bank valuations respond differently to geopolitical risk across institutions (Niepmann, Shen, and Walker, 2026).

[5] Swedish corporate borrowing rose sharply in early 2022, supported by strong demand from the commercial real estate sector, the post-pandemic recovery, and banks' continued lending capacity, which remained solid thanks to strong profitability and capital buffers. Russia's full-scale invasion of Ukraine increased inflation, uncertainty, and market stress. However, its direct short-run impact on Swedish industry was limited by Sweden's relatively low trade exposure to Russia and Ukraine and its low dependence on fossil fuels. At the same time, firms increasingly turned from market financing to bank loans as the corporate bond market became more costly and less liquid (Sveriges Riksbank, 2022:1 and 2022:2; Finansinspektionen, 2022:1 and 2022:2).

### 2.1.1 Did banks adjust lending differently to energy-intensive industries after Russia's full-scale invasion of Ukraine?

Russia's full-scale invasion of Ukraine triggered a sharp surge in oil and gas prices which triggered a global macro-financial shock. Energy-intensive sectors – such as mining, chemicals, and basic metals – emerged as a key transmission channel. These industries were particularly exposed to the energy crisis that followed and, given their central role in complex value chains, provide a useful lens for assessing how geopolitical risk translates into lending behaviour. The results are presented in Table 1.

In Table 1, the post-period indicator ($POST$) equals one for March–April 2022 and zero for September–December 2021 and January–February 2022. The variable $Energy$ identifies firms operating in energy-intensive industries in 2020. The interaction term ($Energy \times POST$) captures how banks adjusted credit allocation to these industries after the invasion, relative to less energy-intensive sectors. Full details of the econometric specification are provided in the table legend.

**Table 1. Sectoral exposure to energy costs**

| | Loan Volume | | Interest Rate | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| POST | 0.046*** | 0.064*** | 0.008 | 0.002 |
| | (0.000) | (0.000) | (0.666) | (0.928) |
| Energy x POST | -0.017*** | -0.018*** | 0.021*** | 0.016** |
| | (0.000) | (0.000) | (0.000) | (0.017) |
| Observations | 356,249 | 279,684 | 356,249 | 279,684 |
| Adjusted $R^2$ | 0.996 | 0.996 | 0.952 | 0.952 |

Note: Table 1 reports results obtained estimating the following regression:

(1) $X_{fbt} = \alpha_{fb} + \gamma_t + \beta_1 \text{POST}_t + \beta_2 \text{Energy}_f + \beta_3 (\text{Energy}_f \times \text{POST}_t) + \text{Controls} + \varepsilon_{fbt}$,

where $X$ is either the log of term loans volume or the interest rate (%). $POST$ equals 1 in March–April 2022 and 0 in September–December 2021 and January–February 2022. $Energy$ identifies energy-intensive industries (ECB and ESRB, 2026: NACE B07–B08, C16–C24, E36–E39, H49–H51) in 2020. Because the variable $Energy$ is firm and time invariant, its main effect is absorbed by firm–bank fixed effects. The interaction term captures credit reallocation after the invasion. Lagged monthly controls (not shown) include GPR, US EPU, loan volume, interest rate, remaining time to maturity, oil price volatility, VIX index, and unemployment rate. One year lagged firm leverage and size, as well as lagged monthly bank stock return volatility and wholesale ratio, the share of a bank's funding that comes from wholesale sources, are also included. Standard errors are clustered at the firm–bank level. P-values are in parentheses: * p<0.10, ** p<0.05, *** p<0.01.
Sources: KRITA, Bisnode-Serrano, Macrobond, S&P Capital IQ.

Table 1 shows that banks increased overall lending following Russia's full-scale invasion of Ukraine, but to a lesser extent for energy-intensive industries. The post-invasion indicator is positive and statistically significant across loan-volume specifications, implying an expansion in credit of approximately 4.6 to 6.4 percent relative to the pre-invasion period. In contrast, the stand-alone Energy coefficient is small and statistically insignificant, indicating no systematic differences in lending levels between energy-intensive and other industries prior to the invasion.

The key result is the negative coefficient on the $Energy \times POST$ interaction. This suggests that, after the invasion, lending to energy-intensive industries increased by about 1.7 to 1.8 percentage points less than lending to other sectors. In other words, although

banks expanded credit overall, they reallocated lending away from sectors most exposed to rising energy costs and heightened uncertainty. Based on the average pre-invasion term loan size in energy-intensive sectors (SEK 1,590,000), this corresponds to roughly SEK 27,000 to 29,000 less lending per firm–bank relationship after the invasion.

Next, Table 1 shows that, although firms' average borrowing costs remain unchanged in the full sample, the Energy × POST interaction term is positive and statistically significant, indicating a 1.6–2.1 basis point relative increase in borrowing costs for energy-intensive firms following the invasion. Relative to a pre-invasion mean interest rate of 3.06 percent, this implies post-invasion rates of approximately 3.076–3.081 percent. Overall, the effect is economically small, consistent with an unchanged assessment of firms' credit risk.

Taken together, the results are consistent with a reallocation of credit rather than a general contraction in lending. In response to the invasion, banks appear to have expanded overall credit supply while shifting away from firms in energy-intensive industries, likely reflecting heightened uncertainty about their exposure to rising energy costs and broader geopolitical risk. The absence of a substantial increase in borrowing costs suggests that this adjustment was driven more by changes in perceived risk and portfolio rebalancing considerations than by deterioration in firms' credit quality per se. These findings are broadly in line with evidence on the role of geopolitical and energy price shocks in shaping credit allocation, as documented in ECB and ESRB (2026), Avril et al. (2025), Behn et al. (forthcoming), and Møller and Poeschl (2025), which emphasise heterogeneous lending responses and sectoral reallocation effects rather than uniform contractions in credit supply.

### 2.1.2 Did banks' credit supply responses differ for vulnerable firms after Russia's full-scale invasion of Ukraine?

While the previous section documents clear differences in lending patterns toward energy-intensive industries, firm-level vulnerabilities may also play an important role within sectors. This section explores this dimension by focusing on financially vulnerable firms, which are generally less able to substitute for lost credit. The results are presented in Table 2 and Table 2.A in the Appendix.

Vulnerability is defined using pre-invasion interest coverage ratios (ICR) —defined as an ICR below or equal to one in 2020, Table 2, or below the bottom industry-specific quartile in Table 2.A in the appendix. The triple interaction term captures whether banks reallocated credit away from vulnerable firms in energy-intensive industries after the invasion, relative to vulnerable firms in less energy-intensive sectors, within the same firm–bank relationships. Because the vulnerability indicator is defined prior to the shock and remains fixed over time, the estimated coefficients capture within-relationship changes rather than cross-sectional differences across firms.

Together, results in Table 2 and Table 2.A in the appendix show that banks adjusted their credit supply after Russia's full-scale invasion of Ukraine by reducing credit to financially vulnerable firms but provide little evidence that this response was particularly acute in energy dependent sectors.

At the aggregate level, credit volumes increased following the invasion, while average interest rates did not exhibit a uniform change. At the same time, vulnerable firms experienced smaller increases in lending volumes. Moreover, firms with ICR below 1 experienced even a statistically significant increase in borrowing costs, although the economic magnitudes are negligible.

**Table 2. Firm-level vulnerability**

| | ICR<=1 in 2020 | |
|---|---|---|
| | Loan Volume | Interest Rate |
| | (1) | (2) |
| POST | 0.065*** | 0.002 |
| | (0.000) | (0.931) |
| Vulnerable x POST | -0.004*** | 0.010** |
| | (0.003) | (0.011) |
| POST x Energy | -0.017*** | 0.017** |
| | (0.000) | (0.023) |
| Vulnerable x POST x Energy | -0.006 | 0.002 |
| | (0.208) | (0.930) |
| Observations | 277,097 | 277,097 |
| Adjusted $R^2$ | 0.996 | 0.952 |

Note: Table 2 reports results obtained estimating the following regression:

(2) $X_{fbt} = \alpha_{fb} + \gamma_t + \beta_1 \text{POST}_t + \beta_2 \text{Energy}_f + \beta_3 (\text{Energy}_f \times \text{Vulnerable}_f \times \text{POST}_t) + \text{Controls} + \varepsilon_{fbt}$,

where $X$ is the log of term loans volume or the interest rate (%). All loans are term loans. $POST$ equals 1 in March–April 2022 and 0 in September–December 2021 and January–February 2022. $Energy$ identifies energy-intensive industries (ECB and ESRB, 2026: NACE B07–B08, C16–C24, E36–E39, H49–H51) in 2020. $Vulnerable$ captures financially weak firms which are defined as firms with an interest coverage ratio (ICR) below or equal to 1 in 2020. The triple interaction term captures whether banks differentially adjusted lending to vulnerable firms in energy-intensive industries after the invasion. Because the variables $Vulnerable$ and $Energy$ are firm and time-invariant, their main effects and interaction are absorbed by firm–bank fixed effects. Lagged monthly controls (not shown) include GPR, US EPU, loan volume, interest rate, remaining time to maturity, oil price volatility, VIX index, and unemployment rate. One year lagged firm leverage and size, as well as lagged monthly bank stock return volatility and wholesale ratio, the share of a bank's funding that comes from wholesale sources, are also included. Standard errors are clustered at the firm–bank level. P-values are in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

Sources: KRITA, Bisnode-Serrano, Macrobond, S&P Capital IQ.

The evidence on energy exposure points to a distinct, sector-level adjustment. Although energy-intensive firms continued to experience comparatively smaller credit expansions, the triple interaction between vulnerability, energy-intensity, and the post-invasion period is generally small and statistically insignificant. This suggests that the reallocation of credit did not appear to be confined to vulnerable firms in energy-intensive industries but instead occurred more broadly across the corporate sector.

Overall, the results indicate that banks responded along two separate dimensions. First, they reallocated credit away from sectors more exposed to energy shocks. Second, they reallocated lending away from financially weaker firms across the board. From a policy perspective, this highlights both sectoral and balance-sheet channels through which geopolitical shocks can affect credit allocation in the real economy.

### 2.1.3 Did pre-invasion geopolitical risk exposure shape banks' credit supply responses to Russia's full-scale invasion of Ukraine?

Table 3 extends the analysis by examining whether banks' lending responses varied with their pre-existing exposure to geopolitical risk. Specifically, it estimates a model in which firms' outstanding credit and borrowing costs are regressed on the $POST$ dummy interacted with a bank-level measure of geopolitical risk exposure estimated prior to the invasion.

Bank exposure is captured by the Bank GPR beta, defined as the sensitivity of a bank's stock returns to the global geopolitical risk index.[6] This measure is estimated using data up to August 2021, employing a five-factor CAPM augmented model with daily geopolitical risk (GPR) shocks over a five-year window.[7] It therefore reflects market-implied bank vulnerability *prior to the invasion* and is independent of borrower characteristics.

**Table 3. Bank-level geopolitical exposure**

| | Loan Volume | Interest Rate |
|---|---|---|
| | (1) | (2) |
| POST | 0.045*** | 0.044** |
| | (0.000) | (0.044) |
| POST x Bank GPR Beta | -3.789*** | 13.718*** |
| | (0.000) | (0.000) |
| Observations | 356,162 | 356,162 |
| Adjusted $R^2$ | 0.996 | 0.948 |

Note: Table 3 reports results obtained estimating the following regression:
(3) $X_{fbt} = \alpha_{fb} + \gamma_t + \beta_1 \text{POST}_t + \beta_3 (Bank\ GPR\ Beta_{Aug2021} \times \text{POST}_t) + \text{Controls} + \varepsilon_{fbt}$,
where $X$ is the log of term loan volume or the interest rate (%). $POST$ equals 1 in March–April 2022 and 0 in September–December 2021 and January–February 2022. $Bank\ GPR\ Beta_{Aug2021}$ measures each bank's exposure to geopolitical risk prior to the invasion (as of August 2021). The interaction term captures whether banks with higher pre-existing exposure to geopolitical risk adjusted lending differently after the invasion. Lagged monthly controls (not shown) include GPR, US EPU, loan volume, interest rate, remaining time to maturity, oil price volatility, VIX index, and unemployment rate. One year lagged firm leverage and size are also included. Standard errors are clustered at the firm–bank level. P-values are in parentheses: * p<0.10, ** p<0.05, *** p<0.01. The sample contains a total of 6 banks.
Sources: KRITA, Bisnode-Serrano, Bloomberg, Macrobond, S&P Capital IQ.

Table 3 provides evidence of a bank-level supply-side channel by showing that lending responses varied systematically with banks' pre-existing exposure to geopolitical risk. While the baseline effect confirms the aggregate credit expansion documented in earlier tables—around 4.5 percent and statistically significant—the interaction term reveals substantial heterogeneity across banks. Banks with higher geopolitical risk exposure prior to the invasion expanded lending less and increased interest rates more than less exposed peers, with both effects statistically significant. The effect on interest rates is economically small, but the reduction in term loan volumes is more pronounced.

[6] See Appendix for more details.

[7] The average Bank GPR beta in the sample of banks for which it could be estimated is -0.0012746 with a standard deviation of 0.001336. A one standard deviation increase in geopolitical risk is associated with a 0.062 percentage point decline in daily excess bank stock returns, based on the average bank GPR beta.

These results remain statistically significant after controlling for banks' size, liquidity, stock volatility, and wholesale financing.

Overall, the evidence points to selective credit reallocation with limited repricing rather than a broad-based tightening in credit supply. The findings suggest that, while the Swedish banking system remained resilient following the invasion, banks adjusted lending according to sectoral exposure, borrower vulnerability and their own exposure to geopolitical risk.

# 3 Discussion and conclusions

This memo shows that Swedish banks expanded credit in the immediate aftermath of Russia's full-scale invasion of Ukraine but did so selectively. Credit growth was weaker for firms in energy-intensive industries compared with other sectors, and financially vulnerable firms—irrespective of sector—experienced smaller increases in credit. Firms' borrowing costs, however, remained largely unchanged.

Although shifts in credit demand cannot be fully ruled out, several features of the analysis point to a credit supply channel. The identification strategy exploits within-firm–bank relationship variation, controls for macroeconomic conditions, and incorporates pre-determined bank-level exposure to geopolitical risk. The combination of weaker lending growth for energy-intensive and financially vulnerable firms, together with limited repricing, is difficult to reconcile with a purely demand-driven contraction. Instead, it suggests selective adjustments in banks' lending allocation across borrowers. Additional support comes from the role of banks' geopolitical risk (GPR) beta—measured prior to the invasion—as firms' credit demand is unlikely to be systematically related to banks' ex-ante sensitivity to geopolitical risk.

These findings are consistent with broader European evidence (ECB and ESRB, 2026), which documents a reallocation of credit away from energy-intensive sectors following the invasion. The Swedish case adds two further insights. First, banks adjusted lending rapidly, as shown by the high-frequency event-study evidence. Second, banks with greater pre-existing exposure to geopolitical risk adjusted lending more strongly, highlighting an important bank-level transmission mechanism.

The results also shed new light on Swedish banks' responses to geopolitical shocks. The Riksbank's Financial Stability Reports identify Russia's full-scale invasion of Ukraine as a significant macro-financial shock to the Swedish banking sector (Sveriges Riksbank, 2022:1; 2022:2). While direct exposures were limited, key risks arose through indirect channels, including energy prices, inflation, and financial market volatility (Sveriges Riksbank, 2022:1). Public disclosures from major Swedish monetary financial institutions further highlight their Nordic and Baltic operations as important channels for these shocks (e.g. Swedbank, 2022). Taken together, these observations support the interpretation of Russia's full-scale invasion of Ukraine as a system-wide but primarily indirect shock transmitted through macroeconomic and sectoral channels, consistent with the mechanisms identified in this analysis.

From a financial stability perspective, the results highlight that resilience in aggregate lending can mask meaningful shifts in credit allocation. A selective reduction in lending to energy-intensive firms may amplify sectoral stress by tightening financing constraints. At the same time, reduced lending to financially vulnerable firms may strengthen bank resilience, but at the cost of amplifying adverse outcomes for those firms. More broadly, these findings suggest that geopolitical shocks can have uneven effects across firms and sectors—for example, not only by directly affecting firms' production costs, but also through the endogenous response of the banking system.

# List of references

Avril, P., McQuade, P., Pancaro, C. and Reghezza, A. (2025), "Geopolitical risk, bank lending and real effects on firms: evidence from the Russian invasion of Ukraine", *Working Paper Series*, No 3143, ECB, Frankfurt am Main.

Aiyar, S., Ilyina, A. et al. (2023), "Geoeconomic fragmentation and the future of multilateralism", *IMF Staff Discussion Note*, No 2023/001, IMF, Washington, DC.

Baker, S.R., Bloom, N. and Davis, S.J. (2016), "Measuring economic policy uncertainty", *The Quarterly Journal of Economics*, 131(4), pp. 1593–1636.

Behn, M., Bozzelli, G., Mendicino, C., Reghezza, A. and Supera, D. (forthcoming), "Global uncertainty, local credit: the bank lending channel of international spillover", *Working Paper Series*, ECB, Frankfurt am Main.

Caldara, D. and Iacoviello, M. (2022), "Measuring geopolitical risk", *American Economic Review*, 112(4), pp. 1194–1225.

European Central Bank and European Systemic Risk Board (2026), "Financial stability risks from geoeconomic fragmentation", joint ECB/ESRB report, January.

Finansinspektionen (2022:1), *Stability in the financial system*, 31 May.

Finansinspektionen (2022:2), *Decision regarding the countercyclical buffer rate*, FI Ref. 22-11683, 21 June.

Hodula, M., Janků, J., Malovaná, S. and Ngo, N.A. (2024), "Geopolitical risks and their impact on global macro-financial stability: literature and measurement", *Working Paper Series*, No 8, Czech National Bank, August.

International Monetary Fund (2025a), *Global financial stability report: enhancing resilience amid uncertainty*, April, Washington, DC.

International Monetary Fund (2025b), *Global financial stability report: shifting ground beneath the calm*, October, Washington, DC.

Metiu, N. (2025), "Global financial transmission of geopolitical risk shocks", SSRN Working Paper, 27 March.

Møller, N.F. and Poeschl, J. (2025), "The effects of a large energy price shock on firm credit", *Working Paper Series*, No 209, Danmarks Nationalbank, 20 February.

Niepmann, F., Shen, L.S. and Walker, J. (2026), "How U.S. bank stock prices respond to geopolitical risk", *FEDS Notes*, Board of Governors of the Federal Reserve System, 2 June.

Sveriges Riksbank (2022:1), *Financial stability report 2022:1*, May.

Sveriges Riksbank (2022:2), *Financial stability report 2022:2*, November.

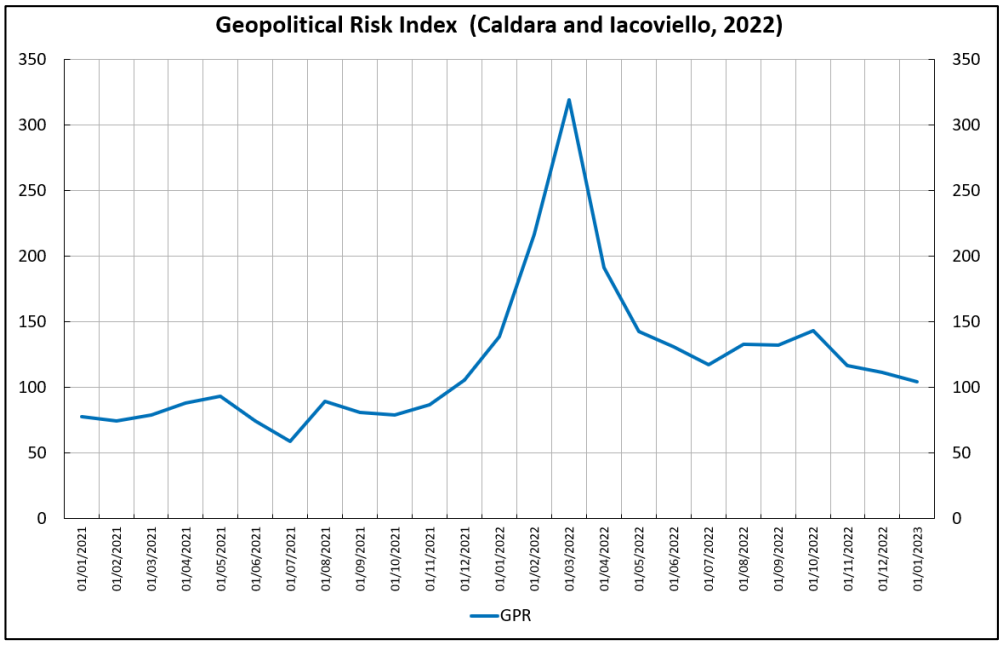
Swedbank (2022), Interim report 2022: Second quarter, April – June, 19 July.

# APPENDIX

## A1: The Geopolitical Risk (GPR) Index

This study uses the Geopolitical Risk Index developed by Caldara and Iacoviello (2022) as a proxy for geopolitical risk. The index measures the frequency of newspaper coverage of adverse geopolitical events, such as wars, terrorism, and interstate tensions. It is available for 44 countries from 1985 onwards, including Sweden. Higher values indicate a greater intensity of geopolitical risk relative to a normalized benchmark period. Figure 1.A shows the evolution of the index from January 2021 through the end of 2022.

**Figure 1.A: GPR Index 2021-2022**




Note: The figure plots the GPR index from 2021 through 2022.
Sources: Caldara and Iacoviello (2022).

Importantly, because the index is news-based, it may understate slow-moving or low-salience developments, such as some cyber threats or sanctions that receive limited media attention. It also does not capture differences in how market participants perceive the same event. Even so, it remains a widely used and practical measure for cross-country analysis, and recent ECB and ESRB work confirms its relevance for financial-stability assessments (ECB and ESRB, 2026).

## A1.1: Banks' Exposure to Geopolitical Risk

To measure banks' exposure to geopolitical risk, Hodula et al. (2024) propose a portfolio-weighted indicator based on the geographic composition of banks' balance sheets. While informative, this approach is not well suited to the Swedish context. Supervisory data on foreign asset exposures are available for Sweden, but the time series is too short for meaningful econometric analysis. The Riksbank's IRIS database provides broader quarterly coverage from 2013 to 2025, yet geopolitical risk data are unavailable for the Baltic countries, which are important markets for several Swedish banks. A portfolio-weighted measure would therefore likely understate actual exposure to geopolitical risk, and it would also be affected by both changes in country-level risk and banks'

own portfolio reallocations. In addition, because the weights are based on total assets, the measure may be mechanically related to the lending outcomes studied in the credit regressions.

For these reasons, this study relies on a novel market-based measure of exposure. This approach is better suited to the empirical setting because it captures how financial markets price a bank's *overall* sensitivity to geopolitical risk, including direct foreign activity, funding conditions, and broader balance-sheet vulnerability. It also provides a pre-event measure of exposure, which is useful for assessing banks' vulnerability before the invasion. Each bank GPR beta is constructed in a CAPM-style framework, in which each bank's daily stock returns are regressed on five market factors and the global daily GPR index over a five-year rolling window. The resulting beta captures each bank's sensitivity to geopolitical risk and is estimated well before each geopolitical event. Throughout the analysis, the memo uses the GPR beta estimated using five years of daily data up to August 2021. This measure avoids reliance on contemporaneous balance-sheet composition, although it is available only for listed banks and may still reflect broader market conditions in addition to geopolitical risk.

Finally, it is important to note that the GPR beta captures a bank's sensitivity to global geopolitical risk even for fully domestic banks listed on the stock exchange. In fact, even a bank that operates *solely* in the domestic market can remain meaningfully exposed to geopolitical risk, because such shocks can affect borrowers, funding conditions, and operating systems through trade and supply-chain disruptions, energy-price spikes, tighter financial conditions, sovereign-bank linkages, and cyber or infrastructure risks (ECB and ESRB, 2026; Hodula et al., 2024; Caldara and Iacoviello, 2022). Domestic concentration may reduce direct cross-border exposure, but it does not eliminate vulnerability in an increasingly interdependent financial system (Sveriges Riksbank, 2022:1; Finansinspektionen, 2022:1).

# A2: Additional Tables

**Table 1.A. Descriptive Statistics**

| | Entire Sample Pre-Invasion | | | Energy=0 | | Energy=1 | |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| | N | Mean | SD | N | Mean | N | Mean |
| Term Loans (000) | 349,226 | 8,020 | 46,000 | 239,308 | 8,100 | 23,953 | 1,590 |
| Interest Rate (%) | 349,226 | 2.82 | 1.49 | 239,308 | 2.77 | 23,953 | 3.06 |
| GPR, Global | 349,226 | 117.81 | 48.53 | | | | |
| EPU, US | 349,226 | 163.33 | 22.18 | | | | |
| ICR | | | | 235,965 | 13.07 | 23,820 | 15.05 |
| Leverage | | | | 237,771 | 0.72 | 23,895 | 0.71 |
| Total Assets (000) | | | | 237,787 | 20,465 | 23,895 | 22,036 |

Note: Table 1.A reports total number of observations (N) and average (Mean) over the period September–December 2021 and January–February 2022. $Energy$ identifies energy-intensive industries (ECB and ESRB, 2026: NACE B07–B08, C16–C24, E36–E39, H49–H51) in 2020.

**Table 2.A. Firm-level vulnerability**

| | ICR< Bottom 1st Industry-Quartile in 2020 | |
|---|---|---|
| | Loan Volume | Interest Rate |
| | (1) | (2) |
| POST | 0.065*** | 0.003 |
| | (0.000) | (0.906) |
| Vulnerable x POST | -0.003** | 0.006 |
| | (0.021) | (0.109) |
| POST x Energy | -0.017*** | 0.009 |
| | (0.000) | (0.237) |
| Vulnerable x POST x Energy | -0.003 | 0.028* |
| | (0.496) | (0.086) |
| Observations | 277,097 | 277,097 |
| Adjusted $R^2$ | 0.996 | 0.952 |

Note: Table 2.A reports results obtained estimating the following regression:

(2) $X_{fbt} = \alpha_{fb} + \gamma_t + \beta_1 \text{POST}_t + \beta_2 \text{Energy}_f + \beta_3 (\text{Energy}_f \times \text{Vulnerable}_f \times \text{POST}_t) + \text{Controls} + \varepsilon_{fbt}$,

where $X$ is the log of term loans volume or the interest rate (%). All loans are term loans. $POST$ equals 1 in March–April 2022 and 0 in September–December 2021 and January–February 2022. $Energy$ identifies energy-intensive industries (ECB and ESRB, 2026: NACE B07–B08, C16–C24, E36–E39, H49–H51) in 2020. $Vulnerable$ captures financially weak firms which are defined as firms with an interest coverage ratio (ICR) in the bottom industry-specific quartile in 2020. The triple interaction term captures whether banks differentially adjusted lending to vulnerable firms in energy-intensive industries after the invasion. Because the variables $Vulnerable$ and $Energy$ are firm and time-invariant, their main effects and interaction are absorbed by firm–bank fixed effects. Lagged monthly controls (not shown) include GPR, US EPU, loan volume, interest rate, remaining time to maturity, oil price volatility, VIX index, and unemployment rate. One year lagged firm leverage and size, as well as lagged monthly bank stock return volatility and wholesale ratio, the share of a bank's funding that comes from wholesale sources, are also included. Standard errors are clustered at the firm–bank level. P-values are in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

Sources: KRITA, Bisnode-Serrano, Macrobond, S&P Capital IQ.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