CHAPTER 2

GEOPOLITICAL RISKS: IMPLICATIONS FOR ASSET PRICES AND FINANCIAL STABILITY

Chapter 2 at a Glance

- Stock prices have generally had a modest reaction to geopolitical risk events, but major events—especially military conflicts—have a disproportionally larger and more persistent effect on asset prices.
- Sovereign risk premiums can increase notably in response to major geopolitical risk events, particularly in emerging market economies with weaker fiscal and external buffers.
- The impact of geopolitical risk events can spill over to sovereigns and firms in other countries through trade and financial linkages, increasing the risk of financial contagion.
- Investors appear to price geopolitical risk into both equity and option markets to some extent. However, the realization of these risks can raise financial market volatility.
- Geopolitical risk events can adversely affect the stability and intermediation capacity of banks and non-bank financial institutions, such as investment funds, with potential impacts on macrofinancial stability.

Policy Recommendations

- Policymakers should consider country-specific geopolitical risks in their oversight of financial institutions. Financial institutions should devote adequate resources to identifying, quantifying, and managing such risks (April 2023 *Global Financial Stability Report*).
- Financial institutions should hold adequate capital and liquidity buffers to protect against extreme but plausible losses associated with the materialization of geopolitical risks.
- Emerging market and developing economies should continue efforts to deepen financial markets, accompanied by robust regulatory frameworks, to help investors manage and hedge against financial risks posed by geopolitical shocks.
- Adequate macroeconomic policy space and international reserve buffers should be maintained to help mitigate the adverse effects of geopolitical risk events.

Introduction

Geopolitical risks, encompassing potential adverse events such as wars, terrorist acts, and inter-state tensions that can disrupt international relations and economic stability, have risen notably in recent years. For example, news-based measures of geopolitical risk events, such as conflicts, wars, terrorist attacks, and military buildups, along with countries' actual military spending (relative to GDP) and restrictions on cross-border trade and financial transactions, have all increased since 2022 compared with levels in preceding years (Figure 2.1, panels 1–3). A measure combining these various indicators to capture overall geopolitical risk and fragmentation has reached its highest level in the last several decades (Figure 2.1, panel 4).[1] The elevated geopolitical risk raises concerns about further diplomatic and military tensions across countries and their potential implications for macrofinancial stability (Aiyar and others 2023; April 2023 *Global Financial Stability Report*).[2]

An increase in geopolitical risks can threaten macrofinancial stability through several channels. For

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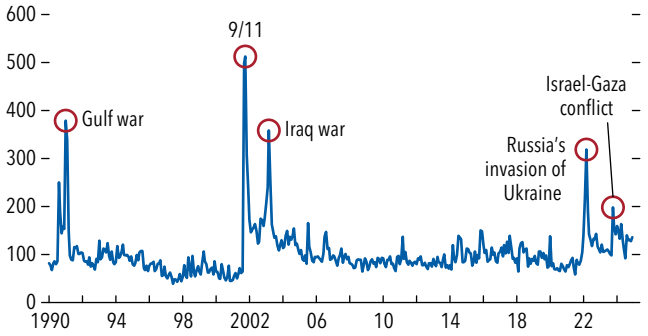
[1]The overall measure of geopolitical risk discussed here, known as the "geoeconomic fragmentation index" is a composite measure of restrictions on cross-border trade, investments, and financial transactions; military conflicts; indicators of diplomatic tensions; and migration policies (Fernández-Villaverde, Mineyama, and Song 2024)

[2]According to some surveys carried out since the second half of 2024 (for example, Bank of England 2024; Natixis Investment Managers 2024), investors and businesses view geopolitical risks as a major downside risk to economic activity and financial stability.

Figure 2.1. Rise in Global Geopolitical Tensions

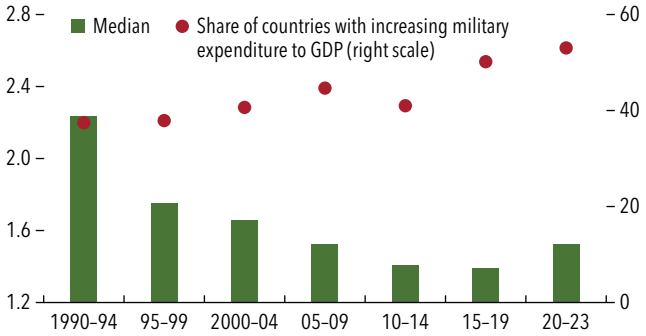
Geopolitical risks remain elevated against a backdrop of multiple conflicts.

1. Geopolitical Risk Index, 1990:M1–2024:M12
(Index, 1985–2019 = 100)



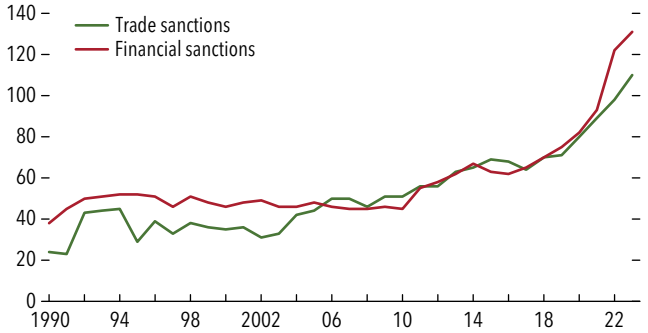
Countries' military spending has increased, on average ...

2. Ratio of Military Expenditure to GDP, 1990–2023
(Percent)



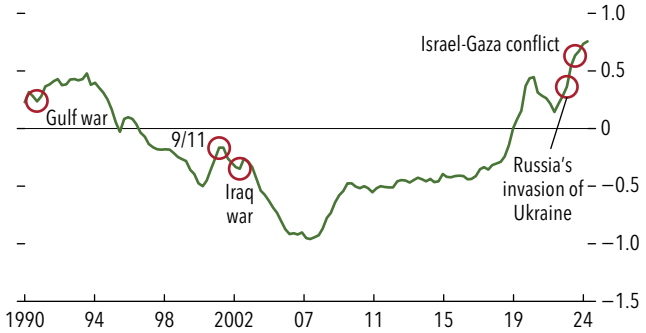
... and an increasing number of countries are facing financial and trade sanctions.

3. Financial and Trade Sanctions, 1990–2023
(Number of sanctioned countries)



A composite measure of geopolitical risk has reached its highest level in several decades.

4. Fragmentation Index, 1990:Q1–2024:Q1
(Standardized)



Sources: Caldara and Iacoviello 2022; Felbermayr and others 2020; Fernández-Villaverde, Mineyama, and Song 2024; Global Sanctions Database (release 4); Stockholm International Peace Research Institute, SIPRI Military Expenditure Database; and IMF staff calculations.

Note: Panel 1 plots the monthly global geopolitical risk index of Caldara and Iacoviello (2022), a news-based measure of adverse geopolitical events that covers 10 major newspapers in Canada, the United Kingdom, and the United States. Panel 2 plots the ratio of median military spending to GDP across all countries in the sample considered in this chapter and the share of countries in the sample with an increase in this ratio, averaged over the time periods indicated on the horizontal axis. Panel 3 presents the number of countries in the sample facing bilateral financial or trade sanctions. The trend of an increasing number of sanctioned countries holds even if Belarus and Russia are excluded from the sample. Panel 4 plots the geoeconomic fragmentation index of Fernández -Villaverde, Mineyama, and Song (2024), a composite measure of 14 indicators of geopolitical risk, such as the geopolitical risk index of Caldara and Iacoviello (2022), and several measures of uncertainty, financial flows, and trade openness. See Online Annex Table 2.1.1 for a description of the variables and data sources.

example, a rise in geopolitical risks that manifests through actual or potential restrictions on cross-border trade and financial transactions or military conflicts can trigger a reallocation of capital flows and cause abrupt asset price corrections (April 2023 *Global Financial Stability Report*; Gopinath 2024).[3] The adverse effect on asset prices can, in turn, jeopardize macrofinancial stability by affecting the liquidity and solvency of financial and nonfinancial institutions and by raising the risk of a negative macrofinancial feedback loop (Adrian and others 2019).

The impact of geopolitical risks on asset prices may vary across asset classes, sectors, and countries. For example, supply-chain disruptions may increase commodity prices but decrease stock prices if the disruptions are expected to have an adverse effect on economic activity.[4] Differences may also arise across sectors: for

[3]A number of studies (for example, Barro 2006; Berkman, Jacobsen, and Lee 2011; Barro and Ursua 2012; Baur and Smales 2020; Amiti and others 2024, Federle and others, forthcoming) document a significant impact of geopolitical risk events such as military conflicts and trade tensions on asset prices.

[4]For example, after Russia's 2022 invasion of Ukraine, prices of financial assets (such as stocks, sovereign bonds, and exchange rates) fell immediately, whereas prices of commodities (including oil and grains) increased notably on fears of supply disruptions. See Chapter 3 of the October 2023 *World Economic Outlook* for a discussion of how disruption in commodities trade can affect commodities prices and economic activity.

example, the energy sector may benefit if supply-chain disruptions raise oil prices, whereas energy-dependent sectors are likely to suffer in such a case.[5] The effect on countries is likely to differ as well depending on their economic and structural characteristics. For example, commodity-exporting countries may benefit if commodity prices rise in response to a geopolitical risk event. In addition, countries directly involved in a geopolitical risk event may experience more severe outcomes from physical damages or the imposition of trade and financial restrictions, whereas the impacts may be less severe in other countries. Geopolitical risk events can also significantly affect countries that have close economic and financial links with conflict-afflicted countries because of, for example, trade or investment disruption.[6]

The nature and intensity of geopolitical risk also matter. Extreme geopolitical risk events such as military interventions and wars may have a more severe economic and financial impact because of damages to physical and human capital than the imposition of economic sanctions or restrictions. Similarly, longer-lasting conflicts may have a more persistent effect than shorter ones. On average, major geopolitical events since World War II have triggered a modest and short-lived decline in aggregate stock prices, possibly because of policy reactions to mitigate the adverse effects of these events. But, in some cases, such as the 1973 Arab oil embargo and the 1990 Iraq invasion of Kuwait, the adverse stock market reaction was stronger and more persistent, lasting over several months (Figure 2.2, panels 1–3).[7]

Geopolitical risk events may be challenging for investors to price because of their unique nature, uncertain duration and scope, and rare occurrence. In some cases, a lack of financial market development may also impede the pricing of geopolitical risk. Moreover, investors may react to geopolitical risk events heuristically (Tversky and Kahneman 1974, 1992; Bordalo, Gennaioli, and Shleifer 2012; Dessaint and Matray 2017) or pay less attention to them if these risks persist for some time. This can lead to investor complacency and sharp market corrections when such risks materialize.[8]

Against this background, this chapter assesses the impact of geopolitical risk events on prices of financial assets and discusses potential policy measures for maintaining financial stability. The chapter begins by laying out a simple conceptual framework that summarizes the main channels through which an increase in geopolitical risk can have an impact on financial asset prices and threaten macrofinancial stability. It then presents some stylized facts on the association between geopolitical risk events and prices in a broad range of asset classes for a sample of major advanced and emerging market and developing economies, and empirically analyzes the following four key questions. First, how does an increase in geopolitical risk affect aggregate stock prices? Second, what factors determine the reaction of stock prices to geopolitical risk events at the firm level, and do cross-border linkages matter? Third, do equity investors price in geopolitical risk? Fourth, do geopolitical risk events affect macrofinancial stability, as proxied by the stability and lending behavior of banks and the redemption risks and returns of nonbank financial intermediaries, specifically investment funds?

To address these questions, the chapter uses various empirical methodologies and data sets. It measures geopolitical risk, at both the global and country levels, primarily using the news-based indices by Caldara and Iacoviello (2022), which capture the realization as well as the perception of risks that could matter for asset prices.[9] On the basis of these indices, the chapter

[5]Sectors related to defense may also benefit from increased government military expenditure in response to a rise in geopolitical risk. For example, the relatively low volatility in US stock markets during major conflicts may be attributable to a substantial increase in defense contracts during these times, which helps to reduce the uncertainty of the future cash flow of firms, especially those that produce goods and services for the military (Cortes, Vossmeyer, and Weidenmier 2024).

[6]For example, Qureshi (2013) finds that military conflicts can affect the bilateral trade of neighboring countries negatively, even if the latter are not directly involved in the conflict. Biermann and Leromain (2024) and Federle and others (forthcoming) show that stock markets in European countries that are geographically and economically closer to Ukraine experienced a larger immediate decline after Russia's invasion of Ukraine.

[7]Empirical analysis later in the chapter takes into account the impact of possible macroeconomic policy reactions to geopolitical risk events when assessing the impact on aggregate stock prices. As for the Arab oil embargo, cumulative stock returns for the US turned positive only after about six years as a recession followed the oil supply shock. During World Wars I and II, stock prices declined notably in countries that were directly involved in the conflict, but also in those that were not (Online Annex Figure 2.2.1).

[8]Even if investors were to account for the likelihood of geopolitical risk events, the actual realization of these events could still result in large asset price corrections as the uncertainty is resolved.

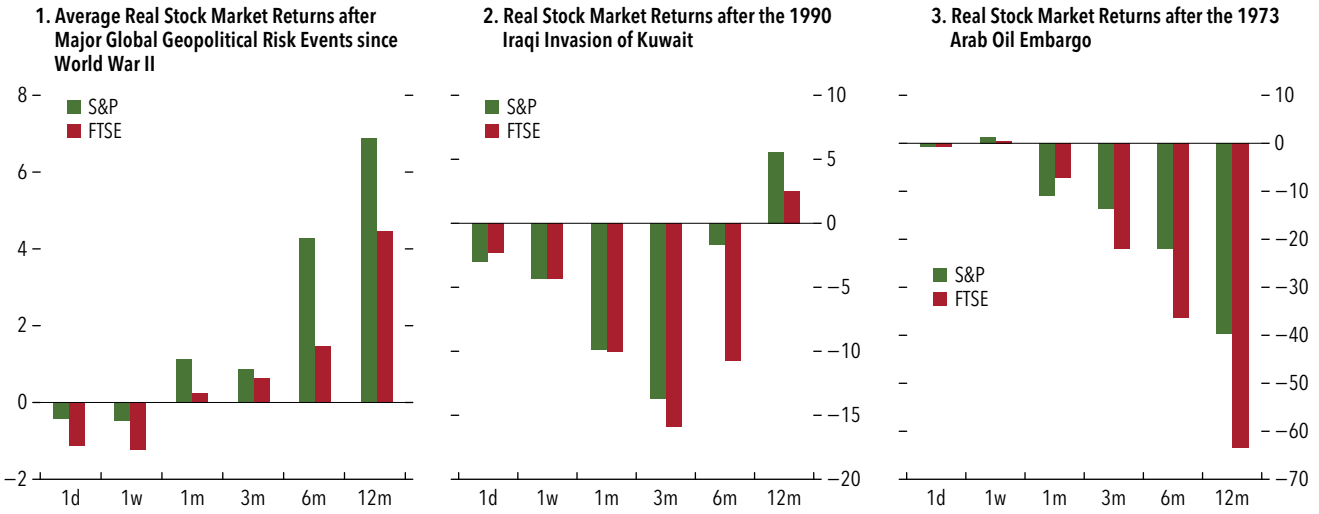
[9]The geopolitical risk indices of Caldara and Iacoviello (2022) are designed to capture various geopolitical risk events, both actual and threats, that have an international impact, such as diplomatic tensions, wars, uprisings and revolutions, and terrorism. The global index reflects the share of news articles in major publications related to adverse geopolitical events in a particular month. Country-specific indices capture the share of articles that meet the authors' criteria for inclusion in the global index and mention the name of a country or at least one of its major cities. These indices tend to be highly correlated with other text-based indices, particularly for large, advanced countries (Bondarenko and others 2024; Liu and Zhang 2024).

Figure 2.2. Stock Market Reaction after Major Geopolitical Risk Events
(Percent)

Stock markets tend to decline modestly after geopolitical risk events ...

... but the effect can be much more severe in some cases ...

... and last longer.



Sources: Caldara and Iacoviello 2022; and Finaeon Global Financial Data.

Note: Major geopolitical risk (GPR) events are identified as those for which the global geopolitical risk index by Caldara and Iacoviello (2022) is more than two standard deviations above the mean (see Online Annex Table 2.3.1 for the list of major global GPR events). The change in the S&P and FTSE indices is computed from the identified onset of an event to one day (1d), one week (1w), one month (1m), 3 months (3m), 6 months (6m), and 12 months (12m) afterward (in cumulative terms). For comparison, annual real return to S&P and FTSE indices after June 1950, when the first major post-World War II geopolitical risk event is identified, is 6.3 and 3.5 percent, respectively. "S&P" in the panels shows the cumulative returns for the S&P 500 index starting from 1957 and for the S&P 90 before 1957.

identifies about 450 major geopolitical risk events across countries over 1985–2024; events are defined as "major" if their scores on the index are at least two standard deviations above the average score for the country where they occurred.[10] About one-sixth of the events classified as major are international military conflicts; others involve diplomatic tensions, domestic political unrest, terrorism incidents, or the announcement and implementation of trade restrictions.

Transmission of Geopolitical Risk to Asset Prices: Framework and Stylized Facts

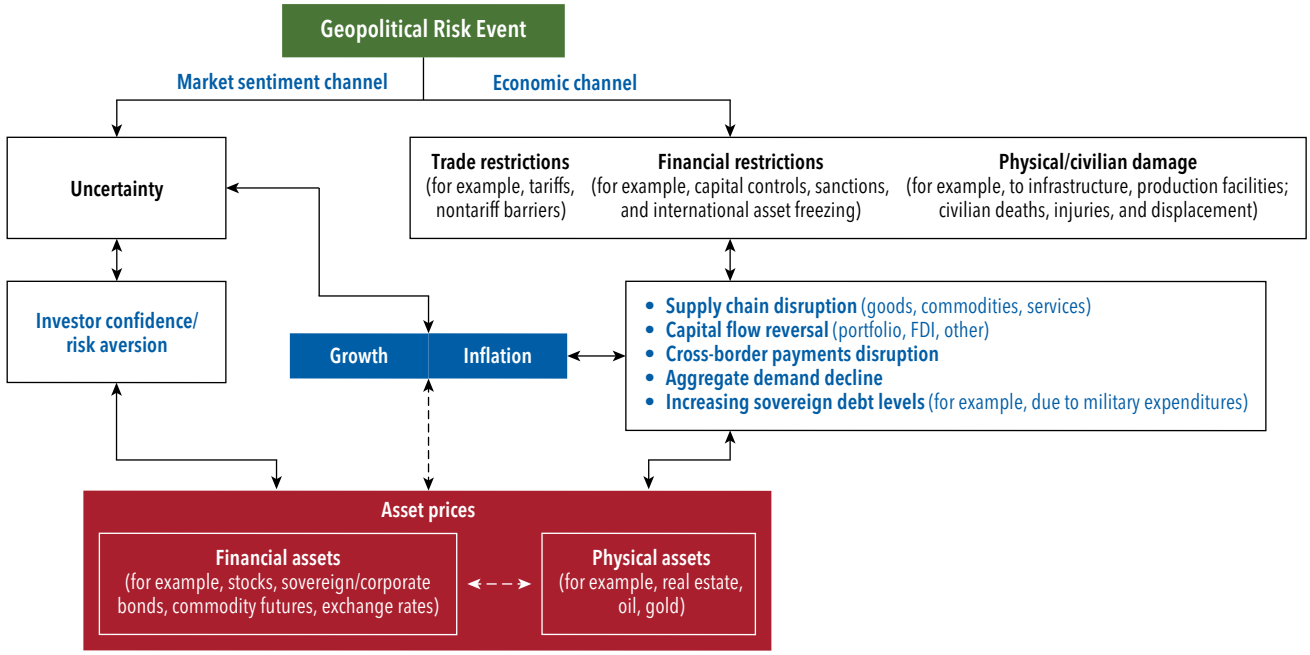
An increase in geopolitical risk can have an impact on prices of financial assets through two key channels. First, it can affect prices through an *economic* channel, whereby the threat or realization of geopolitically motivated restrictions on trade and financial transactions disrupts supply chains, reverses capital flows, or inflicts adverse demand shocks in the economy targeted by the restrictions, directly affecting prices of financial and real assets (Figure 2.3).[11] These changes can also affect asset prices indirectly through policy response to macroeconomic developments, such as growth and inflation. In cases of military conflicts, actual or expected damage to physical infrastructure, production facilities, and civilians and the resulting reduction in domestic and external demand can undermine investment and economic activity, with an impact on asset prices. Sovereign yield spreads or credit default swap (CDS) spreads may also increase if geopolitical risks raise fiscal sustainability concerns (due to, for example, increased spending and borrowing needs or because

[10]Identified events are verified using publicly available sources. Only major events that capture geopolitical risk from the perspective of a specific country are considered. Events that mark multinational summits, such as protests around such summits in a particular host country, are therefore not included as major geopolitical risk events from the perspective of that country. All countries in the chapter's sample had at least one identified major geopolitical risk event during the period under consideration, and some had many.

[11]For example, stock prices are likely to fall if such events are expected to dampen firms' cash flows and profitability, raise discount rates, or both.

Figure 2.3. Key Channels of Transmission for Geopolitical Risk and Prices of Financial Assets

An increase in geopolitical risk can have an impact on prices of financial assets through two key channels.



Source: IMF staff.
Note: FDI = foreign direct investment.

of a decline in output).[12] A second channel through which increases in geopolitical risk can affect prices of financial assets is the *market sentiment channel*. Such increases may raise macroeconomic and financial uncertainty even if no conflict or policy change has been realized, with an impact on asset prices through a decline in investor confidence and an increase in risk aversion (October 2024 *Global Financial Stability Report*).[13] Depressed asset valuations can, in turn, increase liquidity and credit risks for both financial and nonfinancial institutions. Large and abrupt declines in asset prices can also lead to margin and collateral calls, as well as redemption pressures on investment funds that could trigger asset fire sales and contagion within the broader financial system, thereby heightening the risk of an adverse macrofinancial feedback loop.

On average, aggregate asset prices exhibit a modest reaction to major geopolitical risk events, but the impact can be notable in some instances. For example, aggregate stock prices across economies have generally declined in the immediate aftermath of major global geopolitical risk events (Figure 2.4, panel 1). Although the average impact has been moderate, about 3 percent, some events have caused a substantially larger negative impact, up to 9 percent on average across countries.[14] The effects vary based on country-specific factors. For example, commodity-importing countries tend to suffer more, whereas commodity exporters often experience positive stock returns after major geopolitical risk events. The impact on commodity-exporting countries aligns

[12]Meyer, Reinhart, and Trebesch (2022) note that sovereign borrowing has historically been positively linked to extreme geopolitical events such as wars. Huang and others (2015) and Afonso, Alves, and Monteiro (2024) find that an increase in geopolitical risks raises sovereign spreads.

[13]Geopolitical risk indices and measures of economic policy uncertainty provided by Baker, Bloom, and Davis (2016) and the world uncertainty index (Ahir, Bloom, and Furceri 2022) show strong positive correlations in the range of 0.1 to 0.4.

[14]Although aggregate stock prices appear to recover, on average, within a month after the event (Online Annex Figure 2.2.2), subsequent analysis reveals that particularly large shocks can have persistent effects. This chapter primarily focuses on the short-term impact of geopolitical risk events on asset prices, considering that abrupt asset price movements may lead to financial stability concerns.

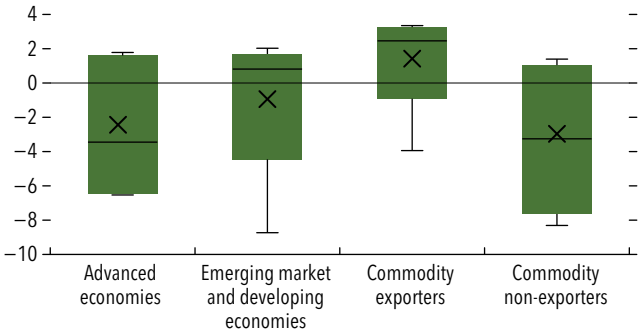
Figure 2.4. Varying Impact of Global Geopolitical Risk Events across Countries and Asset Classes

(Interquartile ranges across events)

Past major geopolitical risk events have generally lowered aggregate stock prices ...

1. Average Weekly Cumulative Change in Stock Market Returns

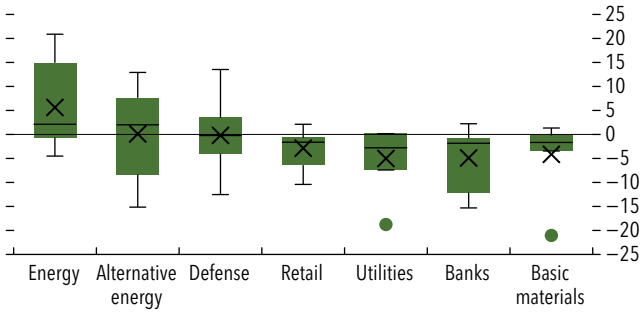
(Percent)



... with considerable variation across sectors.

2. Average Weekly Cumulative Change in Stock Market Returns by Sector

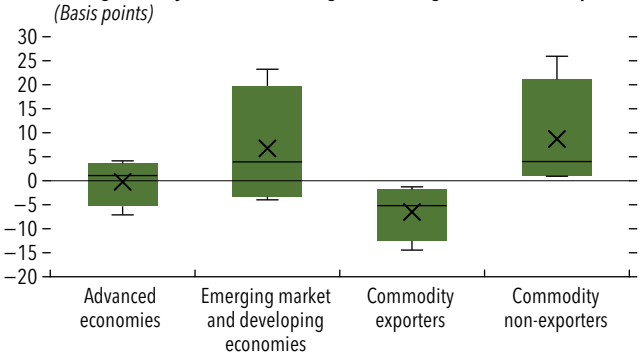
(Percent)



Sovereign risk premiums generally rise more in emerging markets and commodity non-exporters ...

3. Average Weekly Cumulative Change in Sovereign Five-Year CDS Spread

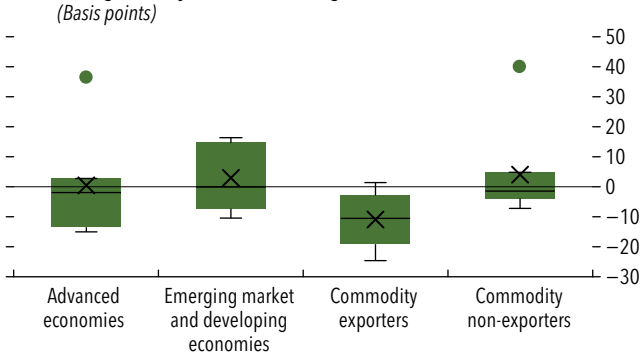
(Basis points)



... along with long-term government bond yields.

4. Average Weekly Cumulative Change in 10-Year Government Bond Yields

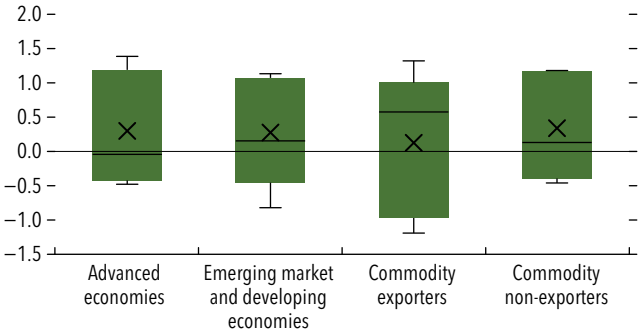
(Basis points)



Local currencies typically depreciate ...

5. Average Weekly Cumulative Change in Nominal Exchange Rate in Local Currency per US Dollar

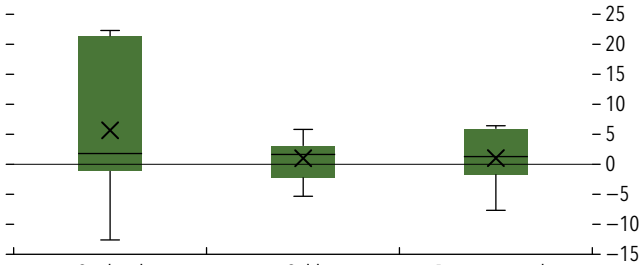
(Percent)



... whereas commodity prices rise after major geopolitical risk events.

6. Average Weekly Cumulative Change in Commodity Futures Prices

(Percent)



Sources: Bloomberg Finance L.P.; LSEG Datastream; UN Trade and Development; IMF, Global Data Source; and IMF staff calculations.

Note: Figure shows the interquartile ranges of one-week cumulative changes in asset prices across major global geopolitical risk events in the sample, defined as those for which the global geopolitical risk index of Caldara and Iacoviello (2022) is more than two standard deviations above the average. Cross marks and lines inside the boxes denote the average and the median impacts across events, respectively. Whiskers show the whole range of impacts across events, excluding outliers, which are shown by dots outside the whiskers. See Online Annex Table 2.3.1 for the list of the identified events. The sample includes the largest 40 economies, classified as advanced and emerging market and developing economies based on the IMF's *World Economic Outlook*, and as commodity exporters and non-commodity exporters based on UN Trade and Development data from 2019 to 2021. Commodity-exporting countries are defined as those for which commodities constitute more than 60 percent of total merchandise exports. In panel 6, precious metals refers to the average prices of copper, palladium, platinum, and silver futures (on a continuous contract basis). CDS = credit default swap.

with a general rise in prices of commodities, particularly that of oil, which tends to benefit firms in the energy sector (Figure 2.4, panels 2 and 6).

Sovereign risk premiums, yields, and exchange rates also react to geopolitical risk. The impact appears most pronounced for commodity-importing countries, whose CDS spreads generally increase more than 1 percent cumulatively one week after major global geopolitical risk events (Figure 2.4, panel 3).[15] By contrast, the sovereign CDS spreads of commodity exporters typically decline. While average sovereign CDS spreads and government bond yields increase slightly in advanced economies after major geopolitical risk events because of some large outlier observations, median values generally decline, suggesting possibly increased risk aversion and flight-to-safety behavior among investors in response to adverse global shocks.[16] Currencies, especially of commodity-importing countries, seem to weaken, on average, following major global geopolitical risk events (Figure 2.4, panels 3–5).

Geopolitical Risk Shocks and Aggregate Stock Prices

Geopolitical risks, macroeconomic outcomes, and asset prices are intertwined. As Figure 2.3 shows, an increase in geopolitical risk can affect prices of financial assets through an increase in uncertainty and disruptions to trade and financial transactions, which can be mutually reinforcing. In addition, factors other than geopolitical risk, such as domestic monetary or fiscal policy stances or global financial conditions, may influence prices of financial assets. To account for these relationships and identify the effect of geopolitical risk shocks on financial asset prices, this chapter estimates a panel vector autoregression model focusing on aggregate stock prices, while differentiating between global and country-specific geopolitical risk shocks.[17]

The analysis shows that geopolitical risk shocks weigh modestly on stock markets, on average, but major shocks can have a more pronounced effect. Aggregate stock prices generally decline by about 0.3 percent in response to a country-specific geopolitical risk shock, and the effect is persistent and lasts at least two years after the shock (Figure 2.5, panel 1).[18] However, more severe geopolitical risk shocks—that is, shocks that increase the geopolitical risk index by at least two standard deviations beyond its mean—have an effect about 7 times larger and are notably persistent. Global geopolitical risk shocks, which are likely to affect international relations or economies at a wider scale, also have an impact on aggregate stock prices. On average, the effect is about 1 percent and persists for a quarter. These effects are quantitatively meaningful, as the average three-month stock market return across countries in the chapter's sample is about 0.1 percent. In other words, a typical geopolitical risk shock has an impact about three times as large, and a large geopolitical risk shock has an impact about 20 times larger, than the average stock market return.[19]

Macroeconomic uncertainty and the risk attitude of participants in financial markets are two key channels through which geopolitical shocks are transmitted to aggregate stock prices. Following major domestic or global geopolitical shocks, the Chicago Board Options Exchange Volatility Index (VIX)—a widely used measure of expected volatility and market uncertainty—tends to spike (Figure 2.5, panel 2). This increase in implied volatility could reflect a lower tolerance for risk (risk aversion) or investor fears about economic fundamentals (macroeconomic uncertainty).[20] A decomposition of the VIX into these two components

[15]Sovereign CDS spreads measure the cost of buying protection against the risk of a sovereign default.

[16]Traditional safe haven countries not directly part of major geopolitical risk events, such as Japan and Switzerland, show larger median declines in long-term government bond yields.

[17]A panel vector autoregression model captures interdependencies among time series and accounts for country heterogeneity. The benchmark model includes monthly industrial production, the consumer price index, real oil prices, real equity prices in US dollars, short- and long-term rates, and the stock market option-implied volatility. Following the literature, geopolitical risk shocks are plausibly identified recursively (ordered first), assuming structural shocks to geopolitical risk affect all variables contemporaneously. See Online Annex 2.4 for a discussion of the model and the identification methodology.

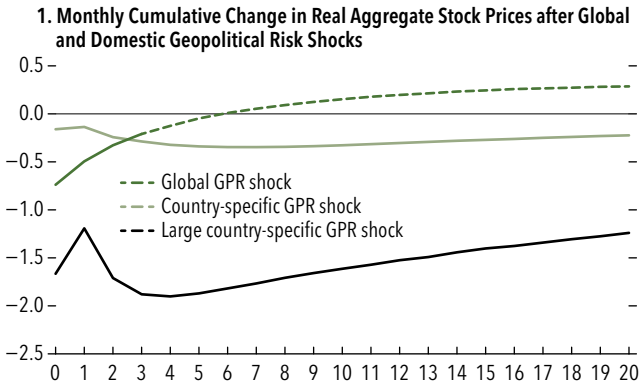
[18]The reported effect applies to country-specific geopolitical risk shocks scaled to two standard deviations. The modest average stock price reaction could be a result of more localized events included in the country-specific geopolitical risk index. It could also indicate that financial markets generally incorporate information on geopolitical risk events to some extent, as shown later in the chapter.

[19]The results presented in Figure 2.5 apply to the full sample of advanced and emerging market economies. An analysis of the subsamples suggests that the average response of aggregate stock prices is somewhat larger for Group of Seven economies compared with the other economies. See Online Annex 2.4.

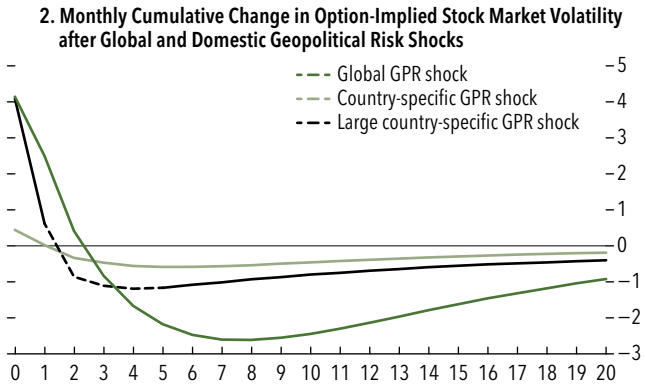
[20]Bekaert, Hoerova, and Lo Duca (2013) decompose the options-implied US stock market volatility (as measured by the VIX) into two components: uncertainty and risk aversion. Uncertainty represents the expected volatility of the stock market and is computed as a prediction of future stock market volatility based on option prices. Risk aversion is reflected in the premium investors demand for bearing risk, which can fluctuate with market conditions and investor sentiment. It is proxied by the variance risk premium, which is the difference between the predicted volatility from options and the actual market volatility.

Figure 2.5. Response of Aggregate Stock Prices and Option-Implied Volatility to Geopolitical Risk Shocks
(Percent)

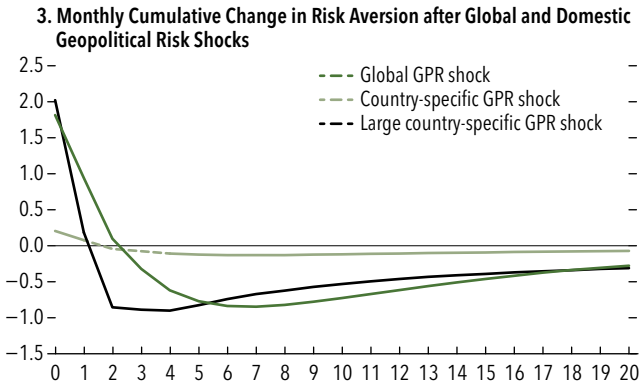
Stock prices decline, on average, across countries after geopolitical risk shocks, particularly after more severe ones ...



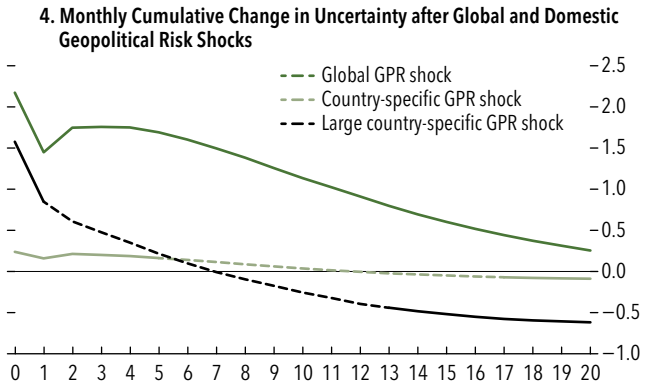
... whereas implied volatility spikes.



Investors' risk aversion increases after geopolitical risk shocks, but the impact is short-lived ...



... whereas economic uncertainty generally *increases* more strongly and persistently.



Sources: Bekaert, Engstrom, and Xu 2022; Caldara and Iacoviello 2022; Chicago Board Options Exchange; IMF, International Financial Statistics database; and IMF staff calculations.

Note: Panels 1–4 show the impulse response functions (IRFs) from the benchmark panel vector autoregressive models for, respectively, aggregate stock prices, the Chicago Board Options Exchange Volatility Index (VIX), risk aversion, and uncertainty. Online Annex 2.4 describes the methodology and sample in detail. For definitions of global and country-specific geopolitical risk (GPR) indices, see Online Annex 2.3. GPR shocks are identified using a recursive ordering in which the global and country-specific geopolitical risk indices of Caldara and Iacoviello (2022) are ordered first, consistent with the plausible exogeneity of the underlying variable. Risk aversion and uncertainty are obtained from the VIX following Bekaert, Hoerova, and Lo Duca (2013) and Bekaert, Engstrom, and Xu (2022). The panels indicate the responses to average geopolitical risk shocks that are scaled, for comparability purposes, to a shock of two standard deviations. The panels also show the responses to large shocks that correspond to observations for which the geopolitical risk index is more than two standard deviations above its mean; otherwise, the variable is set to zero. Solid lines indicate that the effect is statistically significant, that is, the 68 percent credible set around the IRF is not crossing the horizontal axis. The sample comprises major advanced and emerging market economies.

suggests that although both risk aversion and uncertainty increase after large geopolitical shocks, the effect on uncertainty is more notable and persistent, particularly when the shocks are global (Figure 2.5, panels 3 and 4).

An increase in geopolitical risk also raises market tail risks. Beyond the effect on average stock prices, an increase in geopolitical risk also raises downside risks to aggregate stock prices, defined as prices at the 10th percentile of the aggregate stock return distribution across countries (Box 2.1). An increase in global geopolitical risk has a quantitatively larger impact than an increase in country-specific geopolitical risks and lasts for about six months after the risk event that triggers the increase.

These results suggest that major geopolitical risk events can trigger large and persistent corrections in asset prices, generating market volatility that could threaten macrofinancial stability. To better explain how geopolitical risk shocks transmit to prices of financial assets, the analysis in the following section examines the effect of various factors, including the type of risk event

and cross-border trade and financial linkages, using more granular, firm-level data across countries.

Exposure of Firms to Geopolitical Risk

To investigate factors that drive the impact of geopolitical risk events on stock prices, the chapter follows two approaches. First, it carries out a regression analysis using firm-level data for a large panel of advanced and emerging market economies to determine how stock prices react to different types of geopolitical risk events and whether cross-border linkages of firms matter in the transmission of foreign geopolitical risk. Second, the chapter considers case studies of two more recent major geopolitical risk events, Russia's 2022 invasion of Ukraine and the trade tensions between China and the United States in recent years (2018–24), to examine their implications for firms' stock performance in detail.

Firm-level panel analysis suggests that, in general, stock prices react more to international military conflicts than to other types of risk events, particularly in emerging market economies. Regression results show that stock returns decline, on average, by about 1 percentage point in the month of a major domestic geopolitical risk event, which is comparable with the earlier results based on aggregate stock prices (Figure 2.6, panel 1).[21] The impact is statistically and quantitatively significant, as the average monthly firm-level stock return in the sample is about 0.6 percent. However, considerable variation across countries underlies this result. For example, international military conflicts have much larger effects, at about 5 percent, on stock prices of firms in emerging market economies than on stock prices of those in advanced economies (Figure 2.6, panel 2). This may be because advanced economies, unlike emerging market economies, did not experience military conflict on their own soil during the sample period, thus avoiding the risk of significant destruction and economic damage. Their military and economic power also often outpaces that of countries with which they may be in conflict.[22]

[21]This analysis defines domestic geopolitical risk events as major if the country-specific geopolitical risk index of Caldara and Iacoviello (2022) is at least two standard deviations above the country's average. See Online Annex 2.5 for a detailed discussion of the methodology for this analysis and the results.

[22]International military conflicts involving emerging markets in the sample range from mild armed border disputes to full-scale military wars.

Overall, international military conflicts appear to affect stock prices of emerging market firms more than other types of risk events (Figure 2.6, panel 2), underlining that the severity of conflicts matters.[23]

Geopolitical risk events transcend borders and can affect firms through cross-country trade linkages. Geopolitical risk events can still have an impact, through trade linkages, on firms in countries not directly involved in the events. For example, the involvement of a country's main trading partner in a major geopolitical risk event, on average, reduces stock returns for the country's firms by about 1 percentage point (Figure 2.6, panel 1). The impact is more pronounced, up to 2.5 percentage points, when a country's main trading partner is involved in a military conflict (Figure 2.6, panel 3), implying a potentially more significant disruption in revenue stream or supply-chain sources.

Firms' revenue sources and their exposure to partner countries through subsidiaries and corporate shareholders also highlight the importance of disrupted cross-border linkages on stock returns. Specifically, firms that generate a significant proportion of their revenues from, or have subsidiaries or shareholding companies in, countries affected by a geopolitical risk event generally experience an additional decline in their stock prices of 0.1–0.25 percentage points, while controlling for other macro and sectoral effects (Figure 2.6, panel 4).[24] The impact on emerging market firms appears to be primarily through their shareholding companies, rather than their subsidiaries, in countries affected by major geopolitical risk events.

Russia's Invasion of Ukraine

Russia's 2022 invasion of Ukraine had a strong impact on stock markets in both countries. Beginning with media reports of Russian troop movements near the Ukrainian border on October 30, 2021, the Russian stock market entered a gradual decline (Figure 2.7, panel 1). This decline culminated in

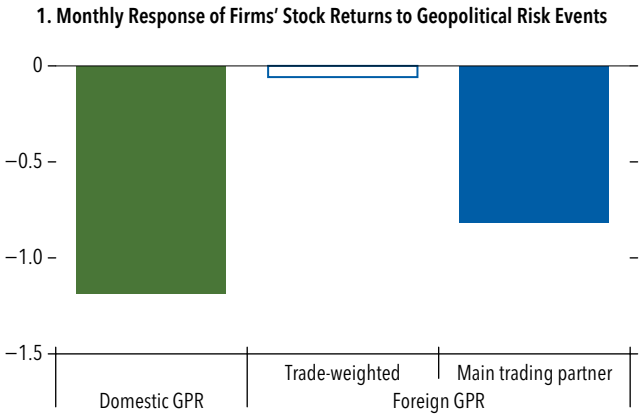
[23]For emerging markets, about one-third of the impact on stock prices appears to be driven by exchange rate movements vis-à-vis the US dollar. Furthermore, the impact on stock returns appears persistent up to at least six months.

[24]The reported results in Figure 2.6, panels 1 to 3, summarize the impact of the various channels laid out in Figure 2.3. Figure 2.6, panel 4, takes a more granular approach and identifies the impact through the trade and investment channels. The analysis here includes all firms in the sample, including those that may benefit from heightened geopolitical tensions, such as energy or defense firms. In countries where such sectors are not dominant, the impact could be larger.

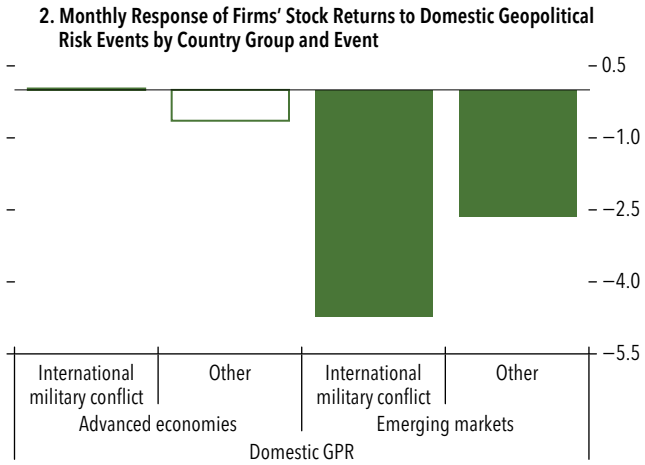
Figure 2.6. Rise in Global Geopolitical Tensions and Firm Stock Returns

(Percentage points)

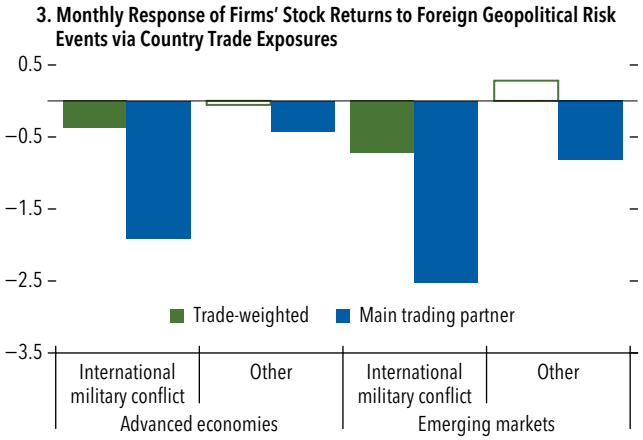
Average firm-level stock returns decline after major domestic and foreign geopolitical risk events ...



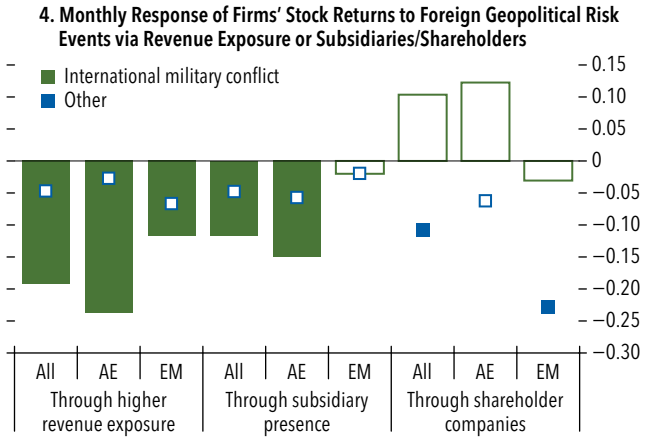
... with a larger effect on emerging markets.



Geopolitical risk events transcend borders and can affect firms globally through trade linkages ...



... through both revenue exposure and presence of subsidiaries.



Sources: Caldara and Iacoviello 2022; FactSet; LSEG Datastream; Orbis; IMF, Direction of Trade Statistics and World Economic Outlook databases; and IMF staff calculations.

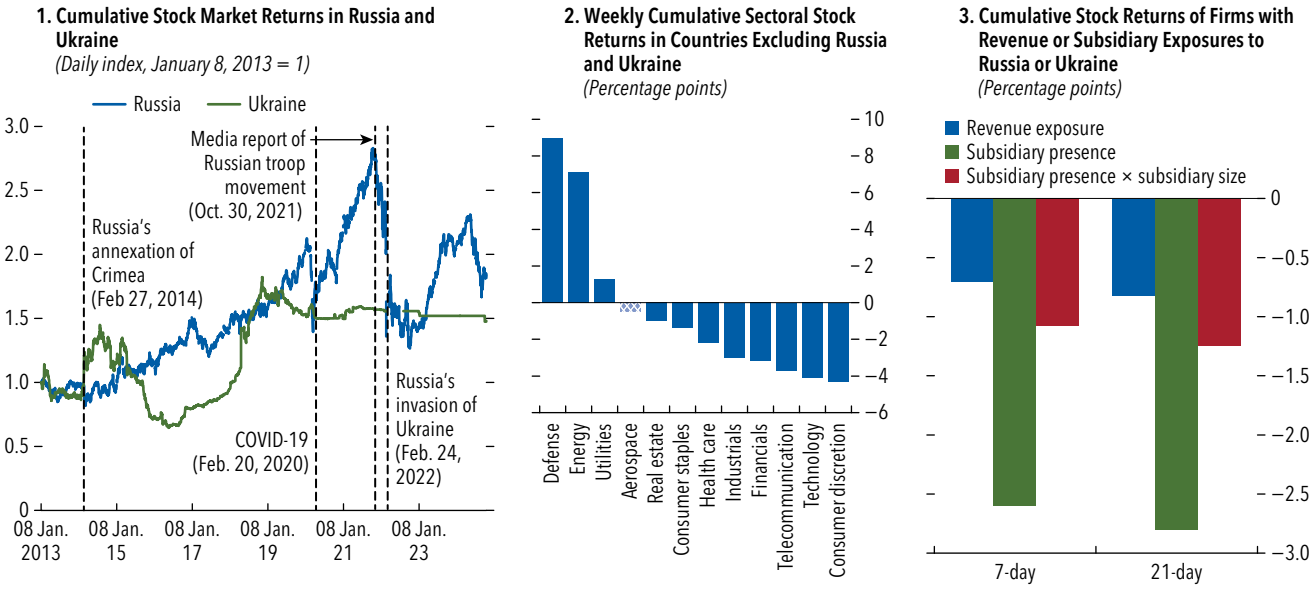
Note: Major geopolitical risk (GPR) events are defined as those for which values on the GPR indices of Caldara and Iacoviello (2022) are more than two standard deviations above the average. The events are cross verified from publicly available data sources and classified as either international military conflicts or other. See Online Annex 2.3 for further details on the definition of GPR events. The estimates are based on a sample of more than 60,000 firms (located in 20 advanced and 20 emerging market economies) and conditional on firm-level controls (panels 1–4), macroeconomic controls (panels 1–3), firm fixed effects (panels 1–3), or firm and country-sector-month fixed effects (panel 4). GPR events are deemed domestic if they occur in the country in which a particular firm is publicly listed and from which it derives most of its revenue, and foreign if they occur in one of its trading partners. Panel 3 shows the impact of involvement in a military conflict of a trading partner whose share in total exports and imports is 10 percentage points (corresponding to an increase in the respective standard deviation of about 2½ percentage points), or of a "main trading partner". "Main trading partner" is defined as the main export or import partner country, where the impacts are similar and averaged. Panel 4 shows the impact of a GPR event on stock returns of firms with higher revenue exposure to or subsidiary/shareholding companies in countries afflicted by such an event, by weighting the foreign GPR indicator variable with cross -border revenue shares, share of cross-border subsidiary, or shareholder companies. The identified impacts correspond to the change in stock returns of firms with a two-standard-deviation higher (weighted) foreign GPR indicator variable among firms within the same country and four-digit sector at a given month. Solid bars or markers indicate statistical significance at the 10 percent or lower level. See Online Annex 2.5 for further details. AE = advanced economies; EM = emerging markets.

Figure 2.7. Stock Returns After Russia's 2022 Invasion of Ukraine

Stock returns of local firms fell notably after Russia's invasion of Ukraine ...

... but the invasion also affected firms in other countries with exposure to Russia and Ukraine ...

... especially those directly connected to Russia.



Sources: FactSet; LSEG Datastream; Orbis; IMF, World Economic Outlook database; and IMF staff calculations.

Note: In panel 1, the Moscow Exchange was closed after Russia's invasion of Ukraine and reopened on March 24, 2022. The reopening was limited, with trading resuming for a select number of major stocks under strict restrictions, including a ban on short selling. The Ukrainian stock exchange also suspended trading until August 8, 2022, when trading partly resumed under strict regulations. In panel 2, the dependent variable is a firm's cumulative stock returns measured in US dollars seven trading days after the invasion (February 24, 2022). The analysis accounts for country-specific fixed effects. See Online Annex 2.6 for a detailed description of the empirical methodology. Solid bars indicate that the effect of the war on a particular industry was statistically significant at the 10 percent or lower level. In panel 3, the dependent variable is a firm's cumulative stock returns measured in US dollars for 7 and 21 days after February 24, 2022. The vertical axis represents the effect (in percentage points) of revenue exposure to either Russia or Ukraine two standard deviations greater than the average in the sample and of subsidiary presence (both unweighted and weighted by the share of subsidiary assets in a firm's total assets) on the cumulative stock returns of firms in the sample. The impact of subsidiary presence weighted by subsidiary size is computed for two standard deviations above the average.

Russia's military invasion of Ukraine on February 24, 2022, when the Russian stock market plummeted by 33 percent and trading on the Ukrainian stock market was suspended.[25]

The impact of Russia's invasion of Ukraine quickly spilled over to firms in other countries, especially those with strong ties to both countries. For example, stock returns of firms in the defense sector in other economies generally rose on investors' expectations of increased military expenditure as security concerns took center stage (Figure 2.7, panel 2). Firms in the energy sector also benefited as oil prices surged on fears of disruption in the global oil supply. By contrast, the invasion adversely affected stock returns of firms in these two sectors with direct revenue exposure to Russia or to Ukraine (Figure 2.7, panel 3). For example, stock returns of firms with high revenue exposures to Russia or Ukraine—defined as two standard deviations above the average exposure in the sample—had cumulatively declined about 0.7 percentage points seven days after the invasion, after accounting for a range of country- and sector-specific factors.[26] Whether firms had subsidiaries in Russia or Ukraine also made a difference. Stock returns of firms with a subsidiary in either or both countries had declined 2.5 percentage points, on average, a week after the war began.

Firms' exposure to Russia, both through subsidiaries and through revenues, has generally declined over time,

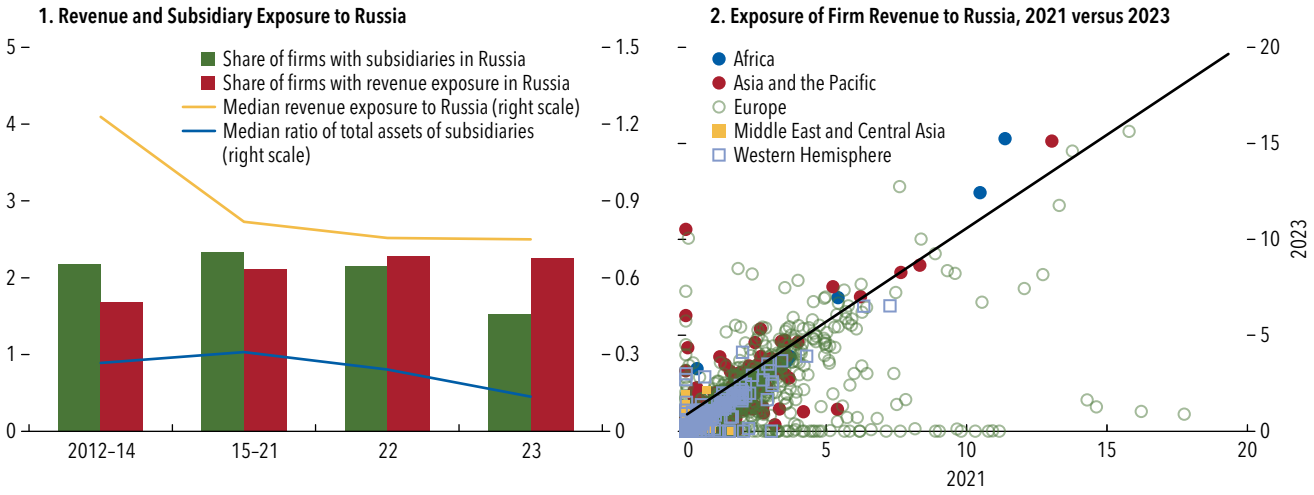
[25]The impact on the Ukrainian stock market was muted, likely because it was characterized by low liquidity and a limited number of listed firms even before the invasion (Gorodnichenko and Rodnyansky 2024). For example, the number of stocks listed on the PFTS (First Stock Trading System) exchange had declined from 20 to 7 by 2018 as the Russian annexation of Crimea and occupation of Donbas in 2014 severely affected many Ukrainian companies.

[26]The average revenue exposure of firms in the sample to Russia or Ukraine before the onset of the war was about 0.1 percent. A two-standard-deviation increase represents firm revenue exposure of about 1.3 percent.

Figure 2.8. Firms' Exposure to Russia
(Percent)

After Russia's invasion of Ukraine, firms reduced their exposure to Russia, on average ...

... but in some countries, firms' exposure to Russia has increased.



Sources: Centre d'Etudes Prospectives et d'Informations Internationales (CEPII); FactSet; LSEG Datastream; Orbis; and IMF staff calculations.

Note: In panel 1, the share of firms with revenue exposure to Russia is based on the largest 100 publicly listed firms in each country. The ratio of total assets of subsidiaries refers to the share of subsidiary assets in total assets of the parent company. Panel 2 shows for each firm in the sample the share of revenue derived from Russia in the year 2023 (*y*-axis) against that in the year 2021 (*x*-axis), with each dot colored by the firm's headquarters location, and the solid line representing the 45-degree reference line. The panel is based on firms that derive up to 20 percent of total revenues from Russia, covering over 99 percent of the firms with revenue exposure to Russia in 2021 or 2023.

but there are several exceptions. The share of firms with subsidiaries in Russia declined after Russia's invasion of Ukraine from more than 2 percent in 2015–21 to about 1.5 percent in 2023 (Figure 2.8, panel 1). Similarly, the size of these subsidiaries also halved, from about 0.3 percent of firms' total assets to about 0.14 percent. Although the share of firms with revenue exposure to Russia has remained somewhat stable, the average size of firms' revenue exposure appears to have decreased marginally. The average statistic, however, masks significant underlying variation, as the revenue exposure to Russia of firms in several European countries has declined, whereas that of firms in some other countries has increased, albeit from relatively low levels (Figure 2.8, panel 2). These findings suggest a possible reorientation of trade and investment linkages after major geopolitical risk events that could be disruptive for some countries, particularly in the near term.

China-US Trade Tensions

Geopolitical risk can manifest in the form of trade tensions. Although trade-related measures are not necessarily associated with geopolitical risk, trade tensions, such as tariffs, trade wars, and sanctions, could be imposed for geopolitical reasons and impact international relations and economic activity. For example, trade tensions between the US and China that accelerated in 2018 are reflected in an elevated geopolitical risk index for China around that time (Online Annex Figure 2.6.2).

Analysis shows that stock prices reacted negatively to tariff announcements by China and the US during 2018–24.[27] After announcements of tariffs on China by the US, the stock prices of Chinese firms declined by nearly 4 percent, on average. This decrease affected firms in both the directly impacted sectors and those in other sectors (Figure 2.9, panel 1).[28] The magnitude of the effect is notable, as the average stock return in these firms in the two-year period prior to the imposition of these tariffs was about 0.1 percent. Moreover, some US tariff announcements had an even larger impact on Chinese firms. For example, average stock

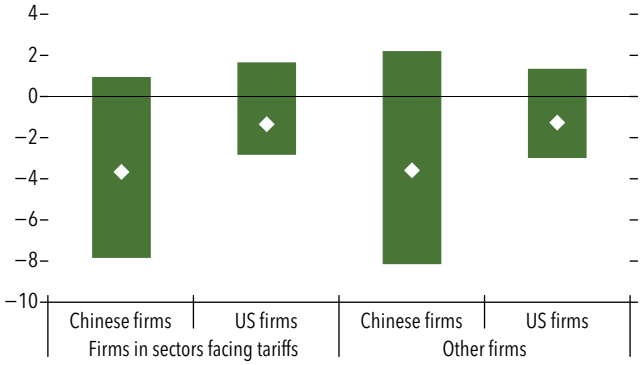
[27]The chapter focuses on announcements that introduced significant tariff increases or imposed new tariffs. It excludes tariff announcements that implied modifications to existing tariffs or followed within a few days of each other, as well as those that were eventually not implemented. See Online Annex 2.6 for details.

[28]The strong impact on firms in sectors not directly affected by tariffs could indicate interconnectedness among firms, as well as broader uncertainty and investor risk aversion. See Online Annex 2.6 for additional details.

Figure 2.9. China and US Tariff Announcements and Firm Stock Returns

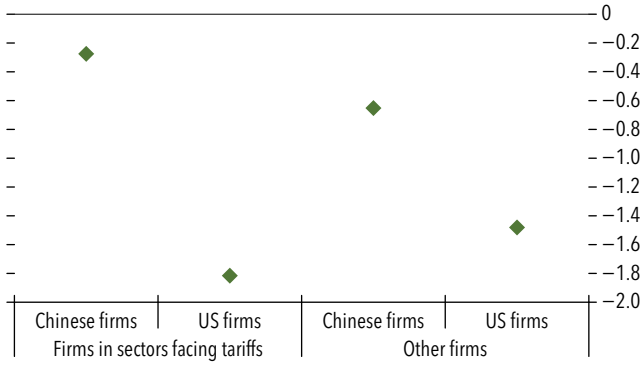
US tariff announcements had a negative impact on the stock prices of Chinese and US firms ...

1. Cumulative Three-Day Effect of US Tariff Announcements on Firms' Stock Prices
(Percent)



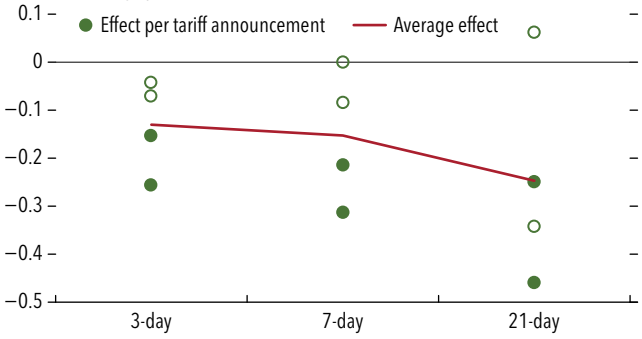
... as did tariff announcements by China.

2. Effect of China's Tariff Announcement on Firms' Stock Prices
(Percent)



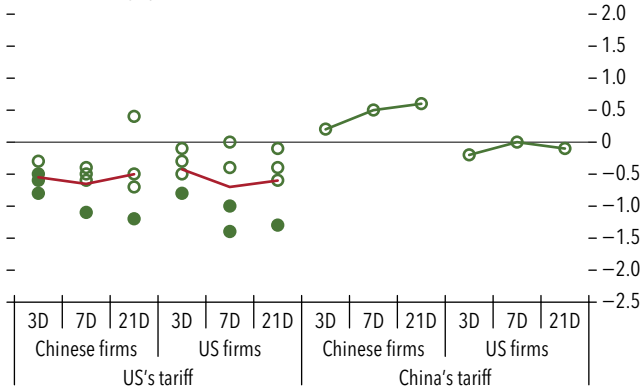
US tariffs affected firms with revenue exposure to the United States more strongly ...

3. Effect of Revenue Exposure on Chinese Firms' Cumulative Stock Returns across US Tariff Announcement Dates
(Percentage points)



... along with Chinese firms with US subsidiaries and US firms with subsidiaries in China.

4. Effect of Subsidiary Presence on Cumulative Stock Returns across China and US Tariff Announcement Dates
(Percentage points)



Sources: FactSet; LSEG Datastream; Orbis; and IMF staff calculations.

Note: US tariff increases correspond to the following announcement dates: March 22, 2018; May 6, 2019; August 1, 2019; and May 14, 2024. China's increase in tariffs on US goods, in particular soy and autos, was announced on August 23, 2019. The event dates have been selected based on the earliest official or media announcements of new tariff changes by each country, excluding retaliatory measures announced shortly after initial policies, to isolate primary market reactions, similar to the methodology in Amiti and others (2024) (see Annex 2.6). In panel 1, bars represent the minimum to maximum range of average stock returns across events, with diamonds indicating averages. In panel 2, diamonds represent average stock returns after China's retaliatory tariff announcement. Panel 3 measures effects using coefficients of revenue exposure to the United States. In the regression analysis, the dependent variables are firms' cumulative stock returns measured in US dollar terms for the next three (3D), 7 (7D), and 21 (21D) trading days after the date of a particular tariff announcement. Panel 4 measures effects using coefficients of dummy variables that have values of 1 for Chinese or US firms with subsidiaries in the United States or China, respectively. Solid circles indicate statistical significance at the 10 percent or lower level. Standard errors are clustered at the sector level.

returns declined by almost 8 percent on May 6, 2019, when the US announced tariff increases on Chinese products amounting to $200 billion.[29]

[29]Not every tariff announcement resulted in a pronounced stock market reaction. For example, the tariff announcements on March 22, 2018, and May 14, 2024, had a negligible or positive impact on firms' stock prices, suggesting that the specifics of the announcements matter. More targeted and less severe tariff announcements may have a smaller impact.

Stock prices in the United States also appear to have responded to its tariff announcements. US firms' stock prices declined by 1.3 percent, on average, after the US government made announcements regarding tariffs on China (Figure 2.9, panel 1). This suggests some "spillback" effects, possibly because of the anticipation of retaliatory tariffs, interconnectedness of firms through revenue exposure and supply chains, potential impact on aggregate demand, or a general rise in uncertainty and

investor risk aversion. Consistent with this, stock prices of firms in sectors directly affected by the tariffs declined similarly to those of firms in other sectors.[30]

The retaliatory tariff announcement by China also had a significant impact on both Chinese and US firms' stock prices. Stock prices of US firms fell by 1.6–1.8 percent, on average, after China's announcement of retaliatory tariffs on August 23, 2019. This tariff announcement also appears to have affected Chinese firms, with their stock prices declining by 0.3–0.7 percent (Figure 2.9, panel 2).

Tariff announcements affected firms connected through revenue or subsidiary exposure more acutely. Stock returns of Chinese firms that had revenue exposure to the United States before a US tariff announcement declined by about 0.2 percentage points more after the announcement than those of comparable firms without such revenue exposure (Figure 2.9, panel 3). Moreover, after a US tariff announcement, the stock returns of both US firms with subsidiaries in China and Chinese firms with a subsidiary in the US dropped, on average, by 0.6 percentage points more than returns of comparable firms without such subsidiary presence (Figure 2.9, panel 4).

Taken together, these results suggest that an increase in geopolitical risks, particularly of a military nature, can have significant, adverse effects on financial markets of the countries involved in the conflict. In addition, there can be cross-border contagion effects through trade and financial linkages.

Response of Sovereign Risk Premiums to Geopolitical Risk

An increase in geopolitical risks can influence sovereign risk. This may occur because of higher military spending weighing on a government's fiscal outlook or a deterioration in economic activity pushing up public-debt-to-GDP ratios and raising fiscal sustainability concerns (April 2025 *Fiscal Monitor*). The rise in sovereign risk premia can in turn impact financial stability through the interconnectedness of sovereign and financial sector balance sheets (April 2022 *Global Financial Stability Report*, Chapter 2). These effects are likely to be more pronounced in response to military conflicts than to other risk events, given the generally higher fiscal expenditure and greater deterioration in economic growth in the case of such conflicts. To examine whether geopolitical risk events affect sovereign risk, the chapter estimates a panel regression model using sovereign CDS spreads as a proxy for sovereign risk premiums.[31]

Sovereign CDS spreads widen significantly after major geopolitical risk events and most notably during military conflicts. For example, within one month of a country's involvement in a major international military conflict, sovereign CDS spreads widen by about 40 basis points in advanced economies and by about 180 basis points in emerging market economies (Figure 2.10, panel 1).[32] Sovereign risk premiums also increase in response to international military conflicts involving a country's trading partners, particularly its main export and import partners (Figure 2.10, panel 2), likely reflecting a negative impact on economic activity and upward pressures on inflation.

Foreign geopolitical risk events have a more pronounced effect on sovereign risk premiums for economies with smaller fiscal and international reserve buffers or weaker institutional quality. For example, sovereign risk premiums increase more in emerging market economies with high public-debt-to-GDP ratios (defined as those above the median in the emerging markets sample) when their key trading partners are involved in an international military conflict (Figure 2.10, panel 3).[33] Similarly, sovereign CDS premiums increase by 100 basis points more in economies with international reserve adequacy ratios below the sample median, and by 120 basis points in economies with institutional quality below the sample median,

[30]The impact of tariffs on firms in other countries (not directly affected by the tariffs) is less clear. Stock prices for firms in Mexico increased soon after the US tariff announcements on China, whereas firms in Canada, Germany, India, Japan, Korea, and the United Kingdom generally experienced negative stock market reactions (Online Annex 2.6).

[31]Sovereign bond spreads and CDS spreads tend to move together in the long run (Zhu 2004). See Online Annex 2.7 for a discussion of the methodology and the detailed results.

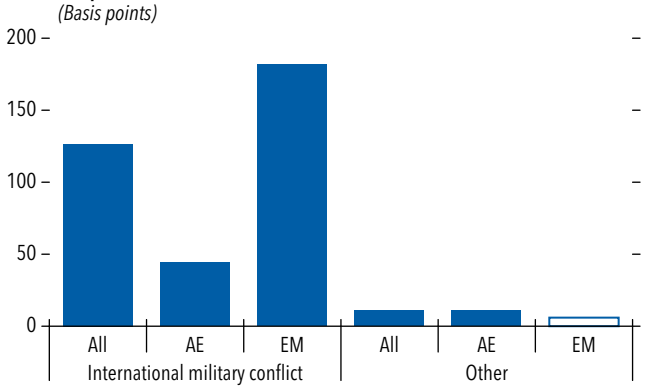
[32]To the extent that sovereign bonds are viewed as safer or less risky investments than other alternatives, an increase in geopolitical risk could also imply a flight-to-safety effect, pushing down sovereign bond yields and sovereign risk premiums. The chapter's analysis, however, suggests that, on average, such safe haven effects do not dominate. Additional analysis shows that in the case of global geopolitical risk events, advanced economies typically act as safe havens and their sovereign risk premiums decline.

[33]This result holds for the full sample of advanced and emerging market economies. However, when the sample is restricted to advanced economies, the results do not suggest an amplifying effect of the public-debt-to-GDP ratio, perhaps because of advanced economies' safe haven status, as noted earlier.

Figure 2.10. Response of Sovereign Risk Premiums to Geopolitical Risk Events

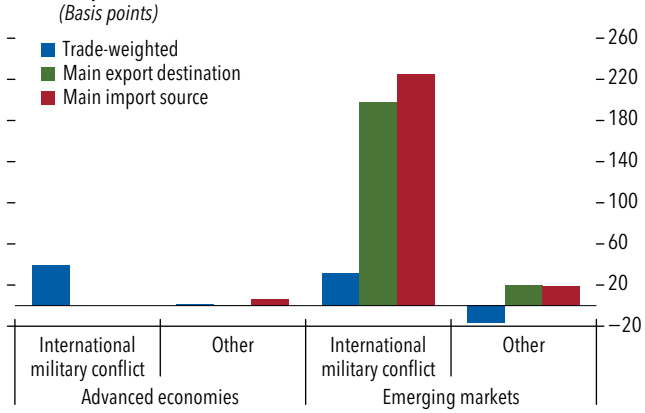
Sovereign CDS premiums rise after major domestic geopolitical risk events, particularly military conflicts ...

1. Monthly Response of Sovereign CDS Spreads to Major Domestic Geopolitical Risk Events
(Basis points)



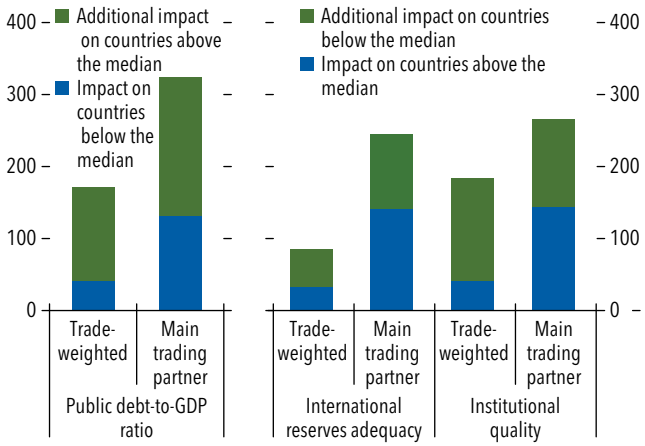
... as well as foreign geopolitical risk events ...

2. Monthly Response of Sovereign CDS Spreads to Major Foreign Geopolitical Risk Events
(Basis points)



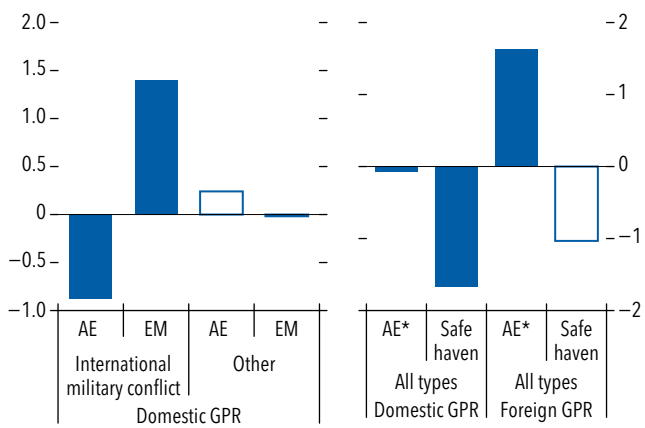
... with a larger impact in emerging markets that have higher levels of public debt and lower ratios of international reserves to GDP or institutional quality.

3. Monthly Response of Sovereign CDS Spreads in Emerging Markets to Trading Partners' Involvement in an International Military Conflict
(Basis points)



Long-term sovereign yields tend to decline in safe haven countries following major geopolitical risk events.

4. Monthly Response of 10-Year Sovereign Bond Yields
(Percentage points)



Sources: Bloomberg Finance L.P.; Caldara and Iacoviello 2022; International Country Risk Guide (ICRG); IMF, World Economic Outlook and Direction of Trade Statistics databases; and IMF staff calculations.

Note: Panel 1 shows the impact on five-year sovereign credit default swap (CDS) premiums, estimated for a monthly panel of 17 advanced and 20 emerging market economies, when a country is involved in an international military conflict, with lags of various domestic macroeconomic fundamentals controlled for, and country and month fixed effects included. "Trade-weighted" in panels 2 and 3 shows the impact in a particular country when a trading partner with a 10 percent greater weight in total trade (corresponding to about 2.5 standard deviations of trade shares in the sample) experiences a geopolitical risk event. Panel 3 interacts the indicator variable for major geopolitical risk events with the lagged public-debt-to-GDP ratio, international reserves adequacy ratio (as defined in IMF 2016), or institutional quality . "Institutional quality" is the average of ICRG's scores on bureaucracy quality, corruption, democratic accountability, investment profile, and law and order, of a country. Panel 4 shows the impact on 10-year sovereign bond yields, estimated for a monthly panel of 20 advanced and 18 emerging market economies, when a country experiences a major geopolitical risk event. These estimates reflect the long-term relationship between geopolitical risk events and sovereign CDS premiums or yields. Safe haven countries are taken as Germany, Japan, Switzerland, the United Kingdom, and the United States. Solid bars indicate statistical significance at the 10 percent or lower level. See Online Annex 2.7 for details. AE = advanced economies; AE* = advanced economies excluding traditional safe haven countries; EM = emerging markets.

after a major trading partner becomes involved in an international military conflict.

Long-term sovereign yields in countries traditionally considered safe havens tend to decline following geopolitical risk events. Following major domestic geopolitical risk events, long-term sovereign yields tend to decline in advanced economies, driven mainly by safe haven countries (Figure 2.10, panel 4). In contrast, the yields in emerging markets tend to increase. Such safe haven effects appear more pronounced for major foreign geopolitical risk events, when long-term yields tend to notably increase in other advanced economies but not so in traditional safe haven countries.[34]

These results suggest that rising geopolitical risks, and the associated macroeconomic uncertainty, can create a feedback loop with fiscal risk, adversely impacting financial stability. A significant geopolitical event can increase sovereign risk premiums, thereby amplifying fiscal vulnerabilities (see also the April 2025 *Fiscal Monitor*). The increase in fiscal vulnerabilities can, in turn, further exacerbate the impact of the geopolitical risk shock on sovereign risk premiums, which may adversely affect banks' balance sheets and lending, especially in countries with less well-capitalized banking systems and higher fiscal vulnerabilities (April 2022 *Global Financial Stability Report*, Chapter 2).

Pricing of Geopolitical Risk

The impact of geopolitical risk shocks on asset prices depends on the extent to which investors price in geopolitical risks. The relationship between geopolitical risk and stock returns can provide insights into the pricing in of geopolitical risks. According to modern asset-pricing theory, investors require positive risk premiums to hold stocks that are likely to lose value when economic activity worsens. This implies that stocks that respond more negatively to geopolitical risk should have higher risk premiums, and those that can hedge against such risks should have lower ones. To determine these premiums—well-established standard approaches from asset pricing—this section first calculates the exposure of assets to geopolitical risk and then estimates the premium expected with this risk exposure.[35]

Stock returns respond heterogeneously to geopolitical risk events. The sensitivity of stock returns to geopolitical risk shocks after market factors are controlled for—known as the geopolitical risk (GPR) beta—is nearly symmetric, with a large number of stocks exhibiting both positive and negative GPR betas (Figure 2.11, panel 1).[36] On average, stocks in the energy and defense sectors exhibit higher GPR betas, implying that their value rises after a geopolitical risk shock, whereas stocks in the consumer goods sector tend to have lower betas. This is consistent with the observation that geopolitical risk events tend to raise energy prices but reduce consumer demand, on average.[37]

Investors seem to factor in geopolitical risk to some extent.[38] When a cross-section of stock returns is examined, the analysis shows a statistically significant and negative premium associated with geopolitical risk shocks between 2012 and 2021. On average, over that period, a one-percentage-point difference in the GPR betas, equivalent to the difference between the average GPR beta for the energy sector and that for all other firms, leads to a negative premium of 0.01 percent-

[34]The results also suggest an increase in long-term yields in emerging markets following major foreign geopolitical risk events. See Online Annex 2.7 for details.

[35]In the first step, the chapter estimates risk exposures (betas) using time-series regressions of firm-level stock returns on risk factors. In the second step, regressions are estimated to obtain the time series of risk premiums for each factor by estimating cross-sectional regressions of returns on the estimated betas (Fama and MacBeth 1973), controlling for market, size, book-to-market ratio, and the momentum factor. The averages of these time series can be interpreted as the risk premiums associated with the factors. In the decile portfolio analysis, the chapter calculates returns of a portfolio that buys stocks with geopolitical risk betas in the highest decile and sells those with betas in the lowest decile. These returns are then regressed on the Fama and French (1993) three factors and the momentum factor. The estimated alphas indicate the (risk-adjusted) premiums for stocks with higher geopolitical risk betas.

[36]GPR shocks are the residuals from the first-order autoregressive model of the logarithm of the global GPR index by Caldara and Iacoviello (2022). See Online Annex 2.8 for a discussion of the sample, methodology, and results reported in this section.

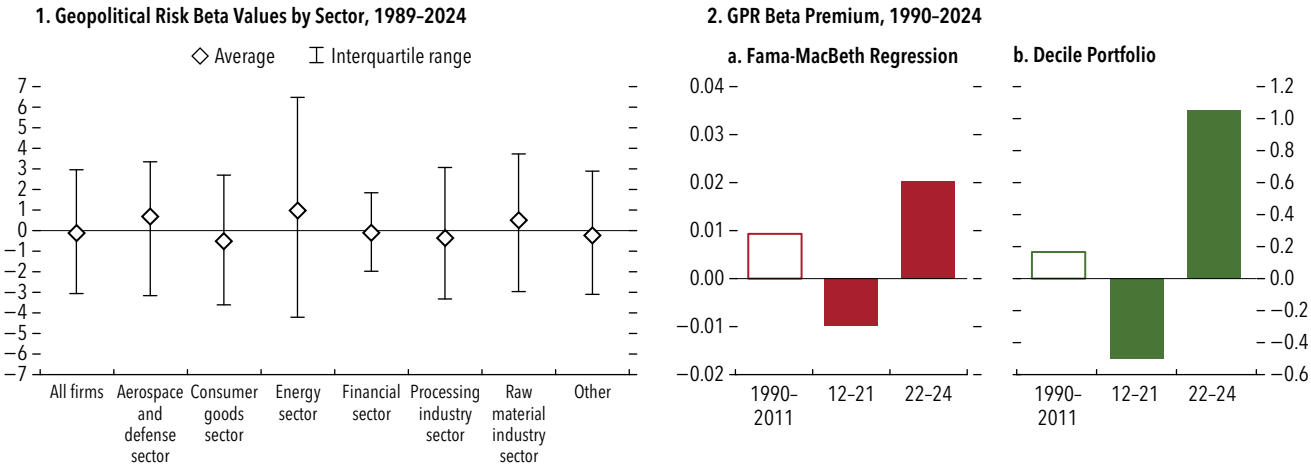
[37]The estimated GPR beta represents the average response of stock returns (in percentage points) to a geopolitical risk shock corresponding with that for Russia's invasion of Ukraine. See Online Annex Figure 2.8.2 for further details on the results.

[38]Consistent with the analysis in this chapter, Hirshleifer, Mai, and Pukthuanthong (2023a, 2023b) find a text-based index measuring war discourse to have significant predictive power for expected returns in the US stock market. Zhang and others (2024); Zaremba and others (2022); and Cheng, Liao, and Pan (2023) also find that geopolitical risk is a significant factor in pricing a cross-section of stocks in China, stocks in the aggregate in emerging markets, and commodity futures, respectively.

Figure 2.11. Pricing of Geopolitical Risk in Stock Markets
(Percentage points)

Stock returns show varying sensitivity to geopolitical risk shocks across and within sectors.

Consistent with investors' pricing in geopolitical risks, stocks that act as hedges offered lower premiums before Russia's invasion of Ukraine and higher premiums afterward.



Sources: Caldara and Iacoviello 2022; LSEG Datastream and Worldscope Fundamentals database; and IMF staff calculations.

Note: In panel 1, diamonds and whiskers, respectively, represent the simple average and interquartile range of the within-industry distribution of the time-series average of the estimated individual excess stock return sensitivity (in percentage points) to a one-unit geopolitical risk (GPR) shock, for a sample period from January 1989 to September 2024. Panel 2 indicates the estimated average coefficients for GPR betas for time windows in Fama-MacBeth (1973) regressions. Subpanel a. shows these coefficients for regressions in which one-month-ahead individual excess stock returns are regressed on GPR betas; subpanel b. shows the alphas of one-month-ahead returns of simple average portfolios constructed by buying stocks with GPR betas in the top 10 percent and selling those with GPR betas in the bottom 10 percent, with Fama-French (1993) three factors and momentum factor controlled for. In both subpanels, the sample period is from May 1990 to July 2024. Solid bars indicate statistical significance at the 10 percent or lower level. For details of the methodology, see Online Annex 2.8.

age points (proxied by the cross-sectional variation in one-month-ahead excess return across stocks). This premium, however, turned positive after Russia's invasion of Ukraine in 2022 (Figure 2.11, panel 2). Moreover, a portfolio that buys stocks with GPR betas in the highest decile and sells those with GPR betas in the lowest decile is found to have generated statistically significant negative premiums of about 0.5 percent per month during 2012–21 but a positive premium of about 1.1 percent after 2022.[39] These results suggest that, before Russia's 2022 invasion of Ukraine, investors demanded a premium for holding stocks that responded negatively to geopolitical risks. But after the invasion, they favored stocks that served as a hedge against such risks.

Investors' consideration of geopolitical risks can also be evaluated by analyzing the protection they seek against potential downside impacts from geopolitical risk events. Options markets are particularly suitable for analyzing the pricing in of such risk because the costs of protection against downside risks can be measured using "out-of-the-money" put options.[40] For an exercise using such an analysis, the chapter focuses on Russia's 2022 invasion of Ukraine and trade tensions between China and the US.

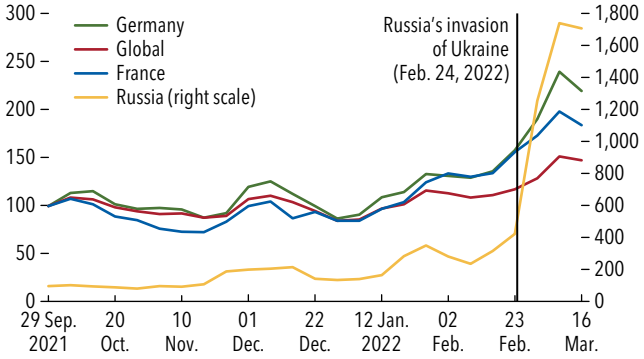
Investors appear to have priced geopolitical risks associated with Russia's invasion of Ukraine into stock options. The premiums for protecting against downside risk (the risk of declining stock prices) and additional premiums for protecting against

[39]Because the GPR betas differ, on average, by about 35 units between the first and tenth deciles, the marginal impact of a one-unit increase in GPR beta on one-month-ahead excess return (about 0.01 percentage point) is similar to the result obtained from the Fama-MacBeth (1973) regression. Moreover, consistent with these findings, GPR beta-based sorted portfolios appear to have provided opportunities for investors to hedge against geopolitical risk (Online Annex Figure 2.8.5).

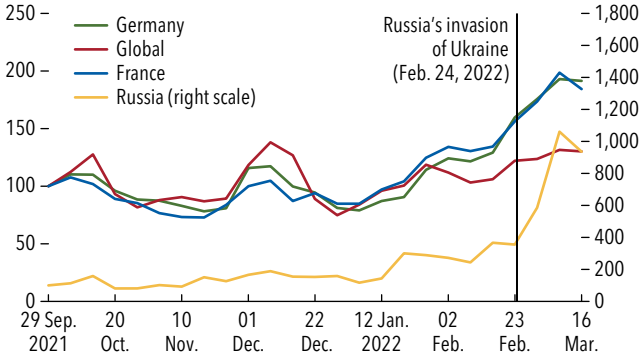
[40]An out-of-the-money put option is a type of options contract with a strike price (the price at which the option can be exercised) lower than the current market price of the underlying asset. Following Pastor and Veronesi (2013), the analysis here measures the cost of protection against tail risks by relating the implied volatility of out-of-the-money put options to their "moneyness" (delta), which measures how much the price of an option is expected to change in response to a change in the price of the underlying asset. See Online Annex 2.8 for further details on the analysis.

Figure 2.12. Pricing of Geopolitical Risk in Options Markets around Russia's 2022 Invasion of Ukraine
(Indices, 22 weeks before invasion = 100; unless noted otherwise)

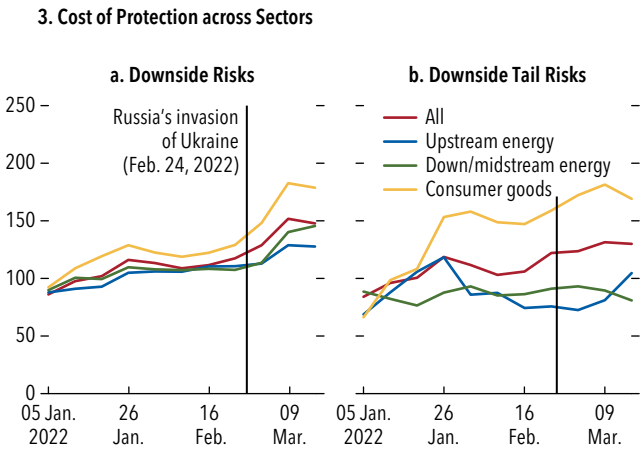
In Europe, the costs of protection from downside risks increased before Russia's invasion of Ukraine ...



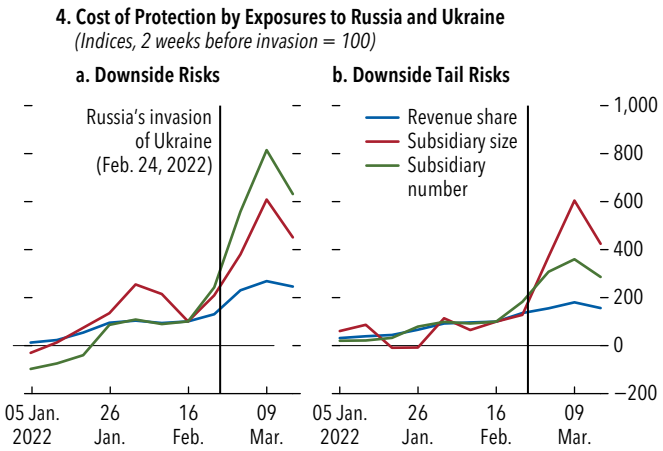
... as did those for protection from downside tail risks.



The cost of both types of protection remained stable for the energy sector while increasing for consumer goods ...



... and for firms with greater exposure to Russia and Ukraine.



Sources: FactSet; LSEG Datastream and Worldscope Fundamentals database; Orbis; and IMF staff calculations.

Note: "Downside risks" and "Downside tail risks" represent estimates of the average level and slopes of the implied volatility curves for firm-level stock put options for one-month-ahead prices; the estimates are calculated using panel data with a one-week window (the respective date and past four business days). The estimates for Russia in panels 1 and 2 are based on a country-level stock index, owing to data limitations. Panel 4 shows the increases in downside risks and tail risks resulting from a one-unit increase in exposures to Russia and Ukraine, relative to firm average exposure. The exposure measures are Russia's and Ukraine's shares in revenue exposure (percent), total asset size of subsidiaries in Russia and Ukraine relative to asset size of the parent company (percent), and the number of subsidiaries in Russia and Ukraine. For details of the methodology, see Online Annex 2.8.

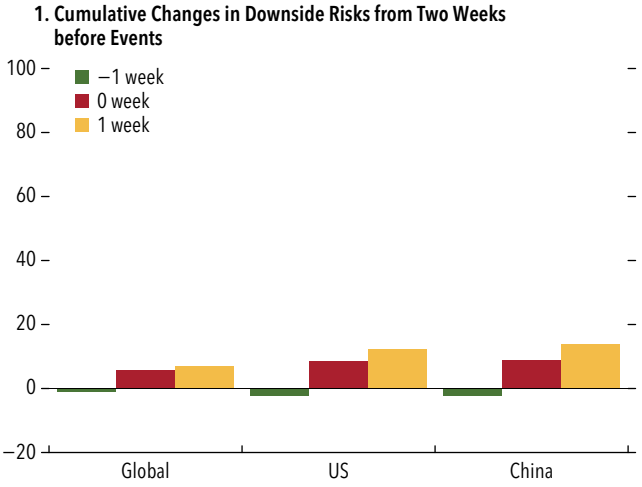
downside tail risks (the risk of extreme drops in stock prices) increased moderately before Russia's invasion but surged notably around the event (Figure 2.12, panels 1, 2, and 3). The premiums increased most for stock options on Russian firms, but they also rose for options on firms in European countries, reflecting the firms' higher exposure to the event than stocks of firms in other geographic areas to geopolitical risk. Sectoral breakdowns indicate that premiums remained stable in the energy sector, consistent with the notion that the sector was benefiting from rising energy prices. By contrast, options on stocks of firms with a higher exposure to Russia and Ukraine through subsidiaries or revenues faced higher premiums (Figure 2.12, panel 4).[41]

China–US trade tensions appear to have increased tail risks. For Chinese and US firms, option premiums for protecting against downside and tail risks increased after the tariff announcements by the Chinese and US governments in 2018–19 (Figure 2.13, panels 1 and 2). By contrast, premiums did not increase for options on stocks of firms in other countries, on average, after

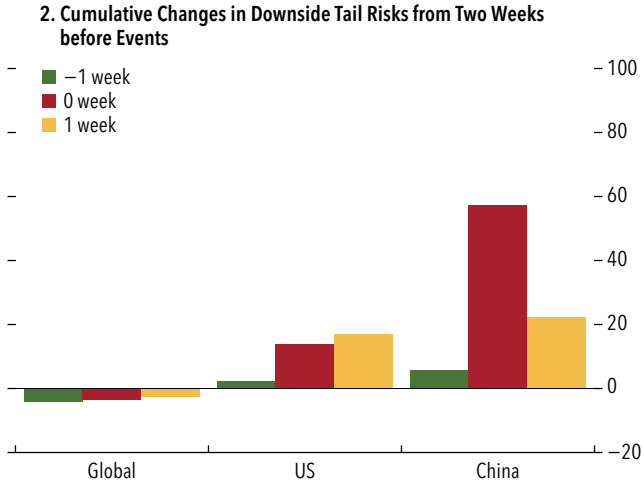
[41]At the onset of the Israel–Gaza conflict, premiums on options of stocks of firms with exposure to Israel increased modestly (Online Annex Figure 2.8.11).

Figure 2.13. Pricing of Geopolitical Risk in Options Markets amid China–US Trade Tensions
(Percent)

The costs of protection from downside risks broadly increased in Chinese and US firms after 2018–19 tariff announcements ...



... and even more strongly for protection from tail risks.



Sources: LSEG Datastream and Worldscope Fundamentals database; and IMF staff calculations.

Note: "Downside risks" and "Downside tail risks" represent estimates of the average level and slopes of the implied volatility curves for firm-level stock put options for one-month-ahead prices; the estimates are calculated using panel data with a one-week (five-business-day) window. Event weeks (0 week) represent the week that consists of the date of a tariff hike announcement by the United States and China and the next four business days. The selected announcements are consistent with those in Figure 2.9, but also include retaliatory tariff announcements. For details of the methodology and selected announcement dates, see Online Annex 2.8.

these announcements. In addition, the option premiums for protecting against tail risk rose more prominently than those for protecting against downside risk, indicating that the China–US trade tensions had a stronger impact on perceived tail risks.

Overall, investors seem to factor geopolitical risk into both equity and options markets. However, surprise realizations of geopolitical risks can still lead to sharp asset price corrections and increased financial market volatility, potentially impacting investors and financial institutions, as discussed in the next section.

Implications of Geopolitical Risk Exposure for the Financial System

Banks and nonbank financial institutions are exposed to a multitude of risks emanating from geopolitical developments. Because adverse geopolitical risk events may trigger market volatility, elevate macroeconomic uncertainty, and disrupt economic activity (Figures 2.3 and 2.5), financial institutions, including banks and nonbanks, may face elevated market, liquidity, and credit risks during these events (April 2023 *Global Financial Stability Report*). Changes in asset prices, especially in the case of rapid selloffs, can cause the value of financial assets held by these institutions to fluctuate significantly, with an impact on the institutions' balance sheets, risk-taking capacity, and funding conditions, triggering an adverse macrofinancial feedback loop. Moreover, investment funds facing rapid outflows after geopolitical risk shocks can exacerbate fragility in less liquid asset markets (October 2022 *Global Financial Stability Report*, Chapter 3). Increased risk of cyberattacks and the fragmentation of financial markets because of sanctions and capital controls can also challenge the operational resilience of financial institutions (April 2022 and April 2024 issues of the *Global Financial Stability Report*).

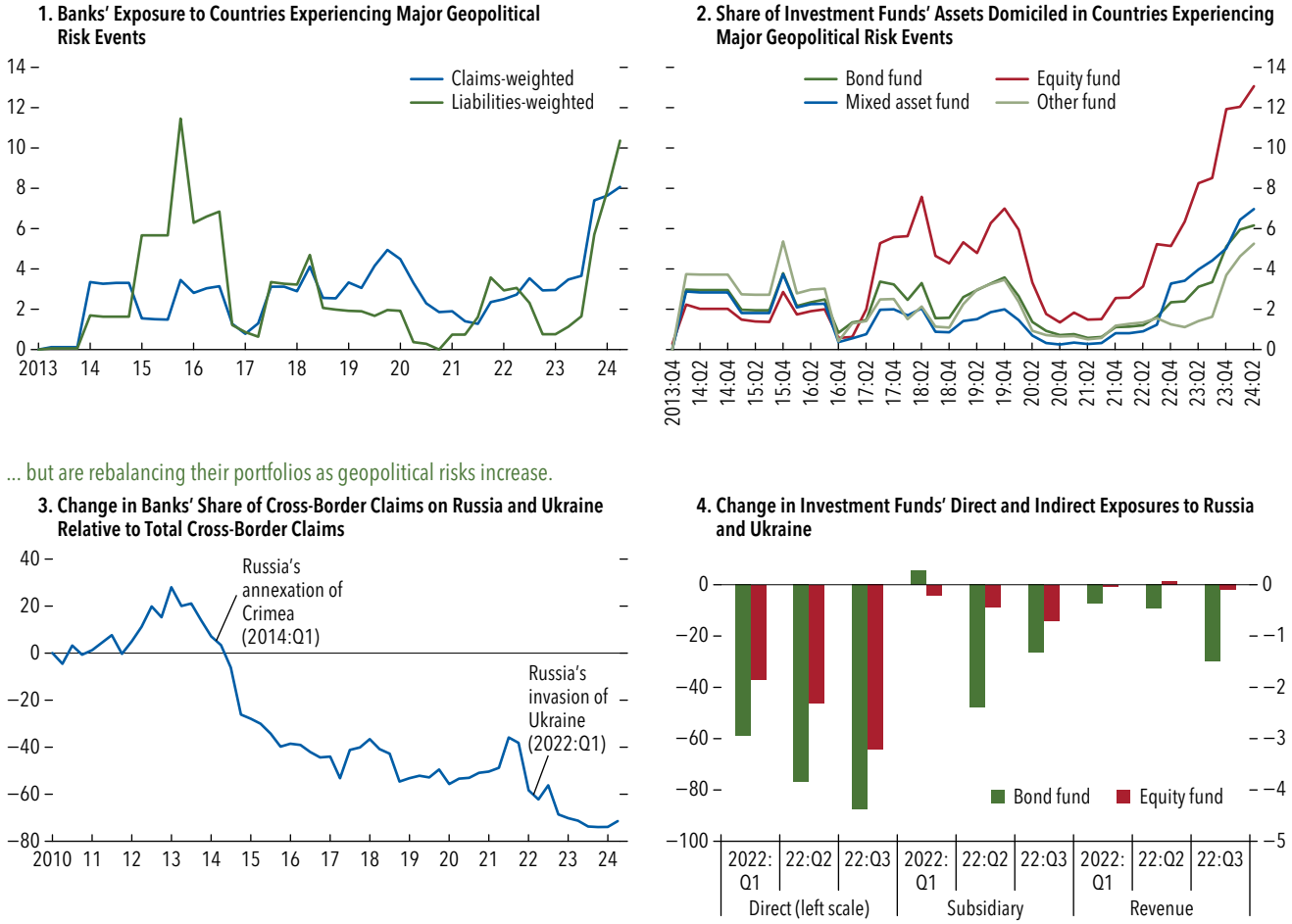
Banks and nonbank financial institutions hold assets in countries exposed to major geopolitical risk events.[42] Cross-border bank claims and liabilities involving countries afflicted by major geopolitical risk events are sizable: about 8 and 10 percent of total cross-border bank claims and liabilities, respectively, as of the second half of 2024 (Figure 2.14, panel 1).[43]

[42]Major geopolitical risk events are defined as those with values more than two standard deviations above the average on the respective geopolitical risk indices of Caldara and Iacoviello (2022).

[43]Banks' exposure to countries involved in major geopolitical risk events has increased considerably over time. The average share of cross-border bank claims on countries experiencing major geopolitical risk events was about 3 percent, on average, from the first quarter of 2000 to the first quarter of 2024.

Figure 2.14. Exposure of Banks and Investment Funds to Geopolitical Shocks
(Percent)

Banks and investment funds are exposed to geopolitical risks ...



Sources: Bank for International Settlements, Locational Banking Statistics; Caldara and Iacoviello 2022; FactSet; Lipper; and IMF staff calculations.

Note: Panel 1 shows 4-quarter moving averages for cross-border exposures, through claims or liabilities on a consolidated immediate basis measured at the end of the quarter, of banking sectors to countries afflicted by a major geopolitical risk event. The averages are calculated by weighting the foreign geopolitical risk indicator variable by the share of cross-border claims on or liabilities against countries for each quarter. Panel 2 is calculated similarly using fund holding positions at the end of the quarters, but the weighted 4-quarter moving averages for the risk indicator variable are averaged instead across individual funds (within fund types). The weighted average of shares across funds, with weights proportional to funds' assets under management, yields a similar picture, but values that are three to four percentage points lower, suggesting that smaller funds tend to have greater exposure to countries afflicted by geopolitical risk events. Panel 3 shows the change in total cross-border banking claims on Russia and Ukraine relative to total cross-border banking claims, expressed as the cumulative percent change relative to the first quarter of 2010. In panel 4, the vertical axis shows the change in portfolio exposures compared with one quarter before the event (that is, in the fourth quarter of 2021). Exposures are calculated as the weighted average of a variable indicating whether the issuer of a security is domiciled in, has at least one subsidiary in, or derives revenues from the countries in which an event occurs and the revenue percentage is higher than the country-sectoral median. The weights reflect the change in shares after the underlying price of assets is kept constant at the price at the end of the quarter before the event.

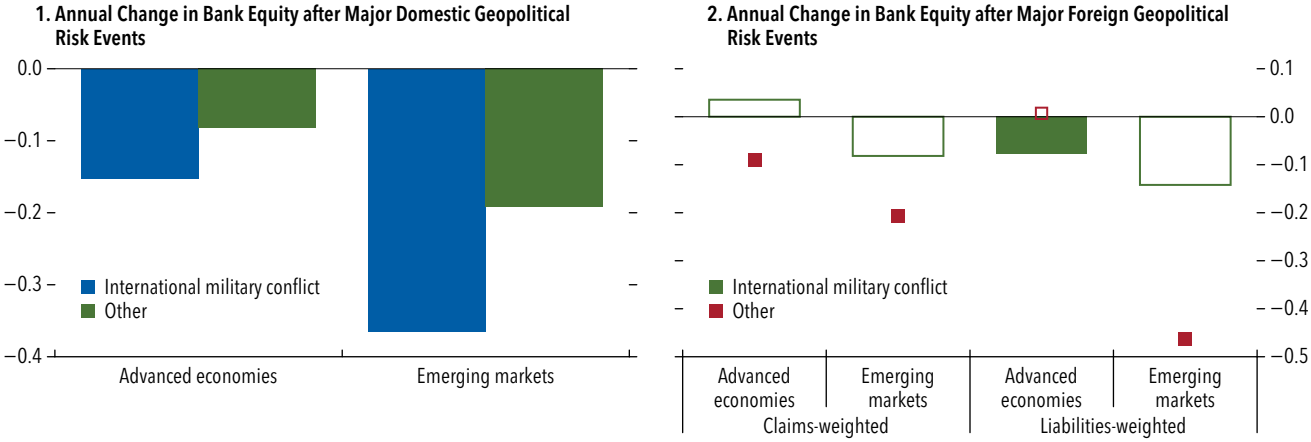
Similarly, the share of holdings by equity funds of assets domiciled in these countries reached 13 percent of these funds' assets in 2024 (Figure 2.14, panel 2). Moreover, most banking sectors and investment funds hold assets in countries exposed to major geopolitical risk events, highlighting previously noted industry concerns regarding geopolitical risks (see footnote 2).

Financial institutions have reduced their exposure to Russia and Ukraine. For example, cross-border banking claims on Russia and Ukraine fell significantly after the annexation of Crimea in 2014 and after Russia's invasion of Ukraine in the first quarter of 2022 (Figure 2.14, panel 3). Similarly, investment funds seem to have reduced their direct exposures to

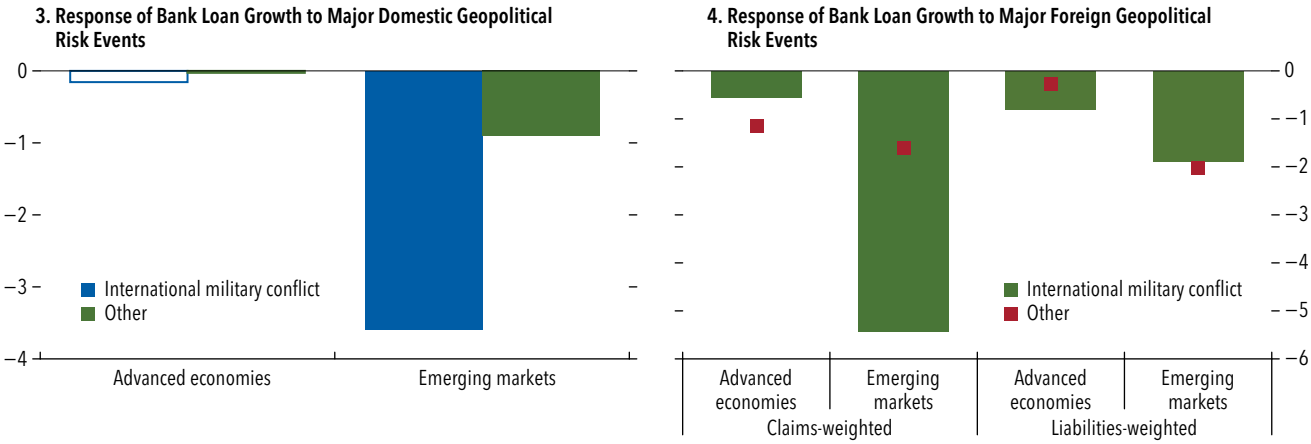
Figure 2.15. Impact of Major Geopolitical Risk Events on Bank Capital and Lending

(Percentage points)

Major geopolitical risk events generally have an adverse effect on bank capital, especially in emerging markets ...



... while weighing on bank lending.



Sources: Bank for International Settlements, Locational Banking Statistics; Bloomberg Finance L.P.; Caldara and Iacoviello 2022; Fitch Connect; and IMF staff calculations.

Note: The panels show the effect on bank outcome variables—namely, the change in the ratio of equity to lagged total assets and the log change in total domestic loans—after major geopolitical risk events in which the country in which a bank is located is involved (panels 1 and 3) or in foreign countries against which banks in a particular country have claims or from which these banks are funded (panels 2 and 4). In panels 2 and 4, the reported magnitudes correspond to the estimated impact of a one-standard-deviation increase in the weighted average of indicator variables for major foreign geopolitical risk events, with weights proportional to the share of total outstanding claims in total cross-border claims (or similarly for liabilities). The results are based on an unbalanced panel of more than 6,000 banks from 21 advanced economies and 15 emerging markets, with controls for a large set of bank and macro variables and bank and year fixed effects. See Online Annex 2.9 for further details. Solid bars or markers indicate statistical significance at the 10 percent or lower level.

both countries by 60 percent after Russia's invasion of Ukraine (Figure 2.14, panel 4). Moreover, investment funds also appear to have reduced their indirect exposures to these countries to some extent. For example, investment funds reduced their holdings of firms in third countries with high (above the country-sectoral median) revenue or subsidiary exposures to Russia or Ukraine.

Major geopolitical risk events may weigh on bank stability and lending, especially in emerging market economies. For example, borrower creditworthiness can deteriorate after a major domestic geopolitical risk event, and banks may cut back lending amid heightened uncertainty. Foreign geopolitical risk events can cause cross-border claims to lose value and make rolling over foreign wholesale debt more difficult, especially when such events affect key counterparts. Empirical results confirm these channels and suggest a stronger impact for emerging market economies, reflecting their greater vulnerability and weaker

capacity to absorb shocks related to such events.[44] For example, bank equity tends to decline when a bank's home country or key foreign counterparts are involved in an international military conflict (Figure 2.15, panels 1 and 2, respectively), contributing to a decline in loan growth (Figure 2.15, panels 3 and 4).[45]

Investment funds with significant exposure to countries involved in geopolitical risk events, especially international military conflicts, generally experience lower returns and lower net flows. Across international military conflicts, bond funds with a 10 percent exposure of fund holdings to countries affected by a conflict subsequently suffered a 1.0 percentage point decrease in returns and a 2.3 percentage point decline in flows. The impact was, on average, smaller for equity funds, with about a 0.2 percentage point decrease in returns and a 0.3 percentage point decline in flows (Figure 2.16, panels 1 and 2).[46] Moreover, investment funds that were highly exposed to Russia and Ukraine experienced lower returns and flows. For example, after Russia's invasion of Ukraine, investment funds with 10 percent of their holdings directly exposed to Russian or Ukrainian assets experienced about a 6 percent decline in cumulative returns within a week and an 8 percent decrease in cumulative flows over the subsequent six months (Figure 2.16, panels 3 and 4).[47]

China–US tariff announcements did not materially affect investment funds. During 2018–24, investment funds holding assets in Chinese firms in sectors affected by US tariffs experienced somewhat lower returns. For example, cumulative returns of funds with an additional 10 percent exposure to Chinese firms directly affected by US tariffs decreased, on average, by about 0.1 percent in the month after the US tariff announcements. However, there was no statistically significant impact on flows into funds (Online Annex Figure 2.10.4).

Overall, these findings suggest that an increase in geopolitical risk, particularly one related to international military conflicts, affects financial institutions and can undermine macrofinancial stability. Major geopolitical risk events generally have a significant impact on the performance and intermediation capacity of financial institutions, especially those in emerging markets. This suggests that should geopolitical shocks become larger, more frequent, or more persistent compared with, for example, those covered in the chapter's analysis, they could have a more severe impact on asset prices and macrofinancial stability.

Conclusion and Policy Recommendations

Major geopolitical risk events could pose a threat to macrofinancial stability. The analysis in this chapter shows that although asset prices have reacted only modestly to most geopolitical risk events, the reaction has varied significantly across different types of events, asset classes, countries, and sectors. Stock prices can decrease, and sovereign risk premiums can increase meaningfully after major geopolitical risk events, notably international military conflicts. Moreover, the analysis suggests that countries with limited fiscal and international reserve buffers are particularly vulnerable to a rise in sovereign risk premiums. The chapter also documents cross-border contagion effects, with the effects of geopolitical risk events spilling across countries through trade or financial linkages. Although geopolitical risks appear to be, at least to some extent, priced into stocks and options markets, the sudden realization of major geopolitical risks can adversely affect bank and nonbank financial institutions, with adverse consequences for macrofinancial stability.

Managers of financial institutions and their oversight bodies should consider the implications of geopolitical risks. Financial institutions should devote adequate resources to identifying, quantifying, and managing geopolitical risks. In addition, policymakers should explore the implications of these risks for the supervision and regulation of financial institutions (Chapter 3 of the April 2023 *Global Financial Stability Report*). Scenario analysis and stress testing, incorporating the interaction of geopolitical risks with traditional

[44]The smaller impacts for advanced economies should be interpreted with some caution as, unlike emerging markets, they were generally not involved in military conflicts on their own soil during the sample period.

[45]The results are generally statistically significant at conventional levels and are economically relevant. For instance, the average annual change in the equity-to-total-assets (lagged) ratio and loan growth are 0.4 and 8 percent, respectively, for emerging markets and 0.4 and 4.4 percent, respectively, for advanced economies. The results also confirm an increase in borrowing costs and nonperforming loans after major geopolitical risk events. See Online Annex 2.9 for details.

[46]These effects are economically significant, given that equity funds without exposure to affected countries before the risk event experienced 0.7 percent monthly return and 0.002 percent net flows, on average, and bond funds without exposure before the risk event experienced 0.2 percent return and 0.01 percent net flows.

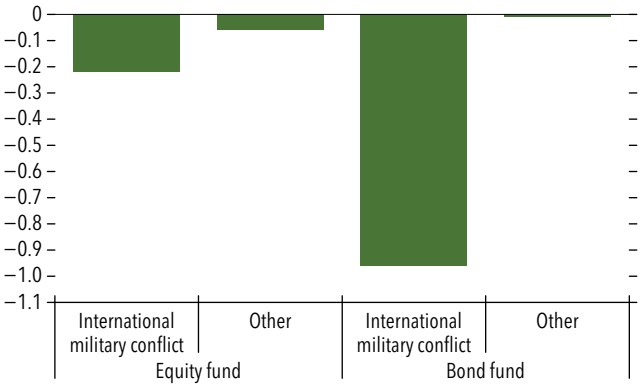
[47]Similarly, funds with 10 percent of their assets from issuers generating substantial revenue from, or having subsidiaries in, Russia or Ukraine saw declines of about 0.2 percent and 0.3 percent, respectively. An increase in subsidiary or revenue exposure decreased cumulative flows by a small amount (see Online Annex Figure 2.10.3). These findings are consistent with those of Wang and Young (2020), who find that investors reduce their investment in equity funds in response to terror attacks.

Figure 2.16. Impact of Exposure to Foreign Geopolitical Risk on Investment Funds

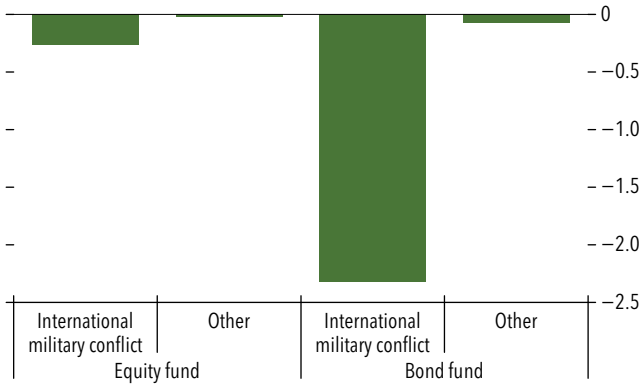
(Percentage points)

Investment funds, particularly bond funds, tend to experience lower returns and lower net flows, especially following international military conflicts, to the extent they ex-ante hold securities of countries involved in the conflict.

1. Impact of Higher Exposure to Destination Geopolitical Risk on Funds' Monthly Returns

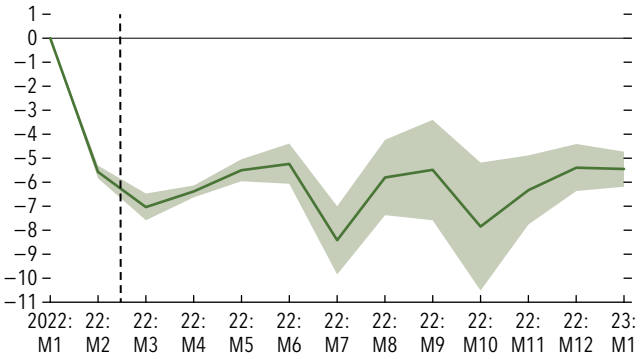


2. Impact of Higher Exposure to Destination Geopolitical Risk on Funds' Monthly Flows



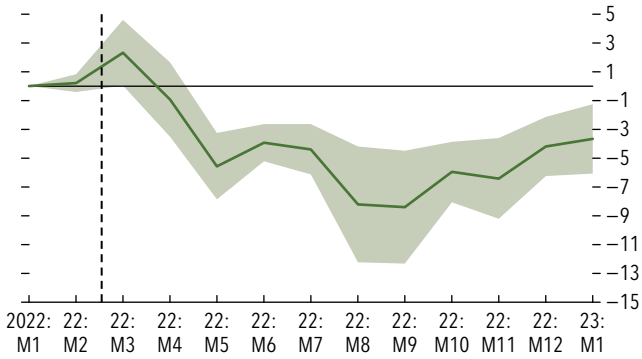
Investment funds with high exposures to Russia and Ukraine experience lower returns ...

3. Effect of a Change in Direct Exposure to Russia and Ukraine on Funds' Cumulative Returns



... and higher outflows.

4. Effect of a Change in Direct Exposure to Russia and Ukraine on Funds' Cumulative Flows



Sources: Caldara and Iacoviello 2022; FactSet: Lipper; LSEG Datastream; and IMF staff calculations.

Note: Vertical axes represent the effect of a 10-percentage-point change in exposure. In panels 1 and 2, exposure measures are calculated as the weighted averages of a variable that indicates whether the issuer of a security is domiciled in a country experiencing high international military conflict risks or high levels of other risks. Investment fund flows at month t are normalized by fund size at month $t-1$. In panels 3 and 4, exposure measures are derived by calculating the weighted average of a variable that indicates whether the issuer of a security is domiciled in Russia or Ukraine. All regression models control for investment fund size and fund liquidity, and flow regressions control for one-month-lagged fund return. Models in panels 1 and 2 also include fund type-domicile-month fixed effects, and standard errors are two-way clustered at fund and domicile-month levels. Models in panels 3 and 4 include fund type-domicile fixed effects, and standard errors are two-way clustered at fund and domicile levels. The weights reflect the holding percentage of each security one quarter before the event. Solid bars indicate statistical significance at the 10 percent or lower level. The shaded area represents the 90 percent confidence interval.

market, credit, and liquidity risks, can support the assessment and quantification of the transmissions of geopolitical shocks to financial institutions.[48] Capital and liquidity buffers at financial institutions should be able to absorb extreme but plausible losses associated with the materialization of geopolitical risks. Policymakers should also ensure that they have appropriate tools to tackle the financial stability consequences of stress in nonbank financial intermediaries (Chapter 2 of the April 2023 *Global Financial Stability Report*), including the use of liquidity management tools by open-end funds to mitigate the systemic impact from abrupt outflows in the face of geopolitical risk events

[48]Financial sector exposures to geopolitical risk may be inherently difficult to determine ex ante given the uncertain nature of these events. This underscores the importance of conducting scenario analysis to determine the resilience of financial institutions in the face of a variety of geopolitical risk shocks. To support the scenario analysis and stress testing, data on financial institutions' direct and indirect exposures to geopolitical risk should be collected.

(Chapter 3 of the October 2022 *Global Financial Stability Report*). Furthermore, crisis preparedness and management frameworks should be strengthened to deal with potential financial instability arising from an escalation of geopolitical tensions.

Policymakers should continue efforts to deepen and develop financial markets in emerging market and developing economies. Deeper financial markets and more developed derivatives markets can support investors' ability to manage and hedge financial risks, including those posed by geopolitical shocks. Robust regulatory frameworks should accompany the deepening and development of financial markets to ensure that hedging activities are conducted safely and transparently by, among other things, setting clear guidelines for the use of derivatives and other financial instruments (Cuervo, Long, and Stobo 2022).

Adequate fiscal policy space and external buffers can help mitigate the potential adverse effects of geopolitical risk events. Fiscal vulnerabilities should be contained to limit the potential amplifying effects of high public debt levels on sovereign borrowing costs, especially amid elevated geopolitical risks and uncertainty, which can undermine macrofinancial stability (October 2024 *Fiscal Monitor*). Economies reliant on external financing should ensure an adequate level of international reserves to cushion the impact of adverse geopolitical shocks and manage risks from potential capital flow volatility in line with the IMF's Integrated Policy Framework (IMF 2020).

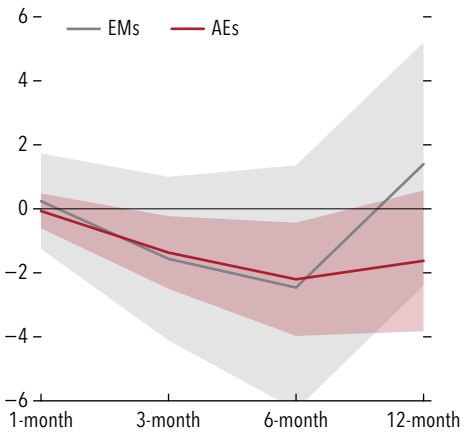
Box 2.1. Tail Risks to Stock Market Returns Amid Global Geopolitical Risks

Geopolitical risk events, such as wars, terrorism attacks, or political unrest, can increase uncertainty and investor risk aversion, raising downside risk for asset prices—that is, the risk of large negative realized future asset returns. The realization of market tail risks could be transmitted to the broader economy through balance sheet and financial acceleration effects, increasing downside risks to output (Adrian and others 2019).

This box investigates the impact of geopolitical risk on downside tail risks to stock market returns in advanced and emerging market economies using a panel quantile regression framework, following the approach in the October 2024 *Global Financial Stability Report*.[1] Geopolitical risk is measured at the global and country levels using the indices of Caldara and Iacoviello (2022) described in Online Annex 2.3.

The results show that an increase in global geopolitical risk raises the likelihood of large future stock market corrections. For example, a two-standard-deviation increase in the global geopolitical risk index is, on average, associated with a decline of 2 percentage points in downside tail risks to stock market returns (defined as the 10th percentile of the distribution of aggregate stock market returns) in advanced economies at a six-month horizon (Figure 2.1.1). For emerging market economies, an increase of a similar magnitude raises downside tail risks, but the effect is not statistically significant. Downside tail risks to stock returns in emerging market economies, however, react more to large country-specific geopolitical risk events (defined as those with index scores two standard deviations above the country-specific average). On average, a large country-specific geopolitical risk event raises downside tail risk to stock returns by about 3 percentage points.[2]

Figure 2.1.1. Global Geopolitical Risk and Downside Risk to Stock Market Returns
(Percentage points)



Sources: Federal Reserve Bank of St. Louis, Federal Reserve Economic Data; Haver Analytics; LSEG Datastream; Organisation for Economic Co-operation and Development, Main Economic Indicators database; IMF, Global Data Source and International Financial Statistics databases; and IMF staff calculations.

Note: The figure shows the impact of a two-standard-deviation increase in the (log) global geopolitical risk index on cumulative stock returns 1, 3, 6, and 12 months ahead for advanced and emerging market economies. The shaded areas indicate the 95 percent confidence interval. AEs = advanced economies; EMs = emerging markets.

The regressions control for a measure of real economic uncertainty (October 2024 *Global Financial Stability Report*), which significantly exacerbates the risk of future stock market crashes in both advanced and emerging market economies. The results therefore suggest that in addition to economic uncertainty, geopolitical risks increase the likelihood of large declines in stock prices, possibly through the economic channel, by affecting economic activity and the expected cash flows of firms.[3]

[1]The analysis focuses on the 10th percentile of cumulative stock returns over 1-, 3-, 6-, and 12-month horizons, using the overall stock price index. The model includes several control variables, standardized at the country level. These include three-month domestic consumer price index inflation, the three-month percentage change in real industrial production, average stock market dividend yield, a detrended short-term (three-month) interest rate constructed using the Hodrick-Prescott filter, the domestic term spread (calculated as the difference between 10-year and three-month government bond yields), the three-month daily stock market volatility, and the price-to-earnings ratio for the overall stock market. The sample consists of about 30 advanced and emerging market economies covering 1990–2024.

[2]These results imply a meaningfully large impact of geopolitical risk, given that the 10th percentile of stock market returns for advanced and emerging market economies in the sample is –5 percent.

[3]Further distinguishing between geopolitical risk events as "acts" or "threats," as in Caldara and Iacoviello (2022), the analysis shows that it is geopolitical acts rather than threats that have a strong impact on downside tail risks to stock markets.

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