Tension Across the Tail: The Cross-Country Effects of Geopolitical Risk on Macroeconomic Tail Risk*

Julian Reynolds† Simon Lloyd‡

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Abstract

We investigate how the impact of geopolitical risk differs across countries and the distribution of macroeconomic outcomes. Applying quantile local projections to a popular metric of geopolitical risk, we show that the macroeconomic effects of geopolitical-risk shocks are larger for emerging market economies than advanced economies. We also find that geopolitical risk has materially larger impacts on macroeconomic tail risk – especially the left tail of GDP growth and the right tail of inflation – compared to the median. These two results are particularly borne out in the impact of geopolitical risk via trade volumes and prices, emphasising the role of international supply-side channels in the propagation of geopolitical-risk shocks, while financial conditions also play a role in transmission.

JEL Codes: E32, E66, H56.

Key Words: Geopolitical shocks; Macro tail risk; Transmission.

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†Bank of England and University of Oxford. Email Address: julian.reynolds@bankofengland.co.uk. Address: Bank of England, Threadneedle Street, London, EC2R 8AH, UK.

‡Bank of England and Centre for Macroeconomics. Email Address: simon.lloyd@bankofengland.co.uk. Address: Bank of England, Threadneedle Street, London, EC2R 8AH, UK.

1 Introduction

Geopolitical tensions increasingly concern macroeconomic policymakers (International Monetary Fund, 2025) and market participants (Bank of England, 2025). In this paper, we exploit cross-country variation in geopolitical risk to assess its effects on macroeconomic outcomes and risks using an outlook-at-risk framework (Adrian et al., 2019). Using panel quantile local projections, we examine how geopolitical risk affects the conditional distribution of multiple macroeconomic variables. We identify geopolitical risk shocks within a cross-country panel, controlling for global moves in geopolitical risk, macroeconomic aggregates and country-quantile fixed effects.

Our main results are as follows. First, geopolitical risk has materially larger impacts on the tails of the distributions of macroeconomic variables – namely the 5^{th} percentile of activity and 95^{th} percentile of prices – compared to the median. Second, this impact is larger in emerging market economies (EMEs) than advanced economies (AEs), particularly in the tails. Finally, the responses of trade volumes and prices suggest supply-side channels are especially important for the transmission of geopolitical-risk shocks.

We contribute to the existing literature by exploiting variation in the country-level geopolitical risk indices to analyse how the impact of geopolitical risk differs across different groups of economies and across the distribution of macroeconomic variables. Most similar to our work, Caldara and Iacoviello (2022) estimate quantile regressions across countries to assess how country-level geopolitical risk affects the distribution of GDP and TFP growth, as well as military expenditure. Also Anobile et al. (2025) analyses how the global GPR index affects US investment-at-risk. We expand on these studies by analysing how geopolitical risk affects inflation-at-risk as well as output-at-risk, and assessing differences between AEs and EMEs, to understand better how geopolitical risks affect the distribution of outcomes across regions.

Furthermore, we apply our quantile regression approach to some of the financial and real-economy transmission channels of geopolitical risk documented by Hodula et al. (2024). In particular, we expand on studies such as Liu et al. (2024) and Hou et al. (2024), which respectively find that geopolitical risk depresses trade volumes and raises trade prices in mean outcomes, by illustrating how geopolitical risk affects tail risks to international trade variables, and distinguishing between effects on AEs and EMEs.

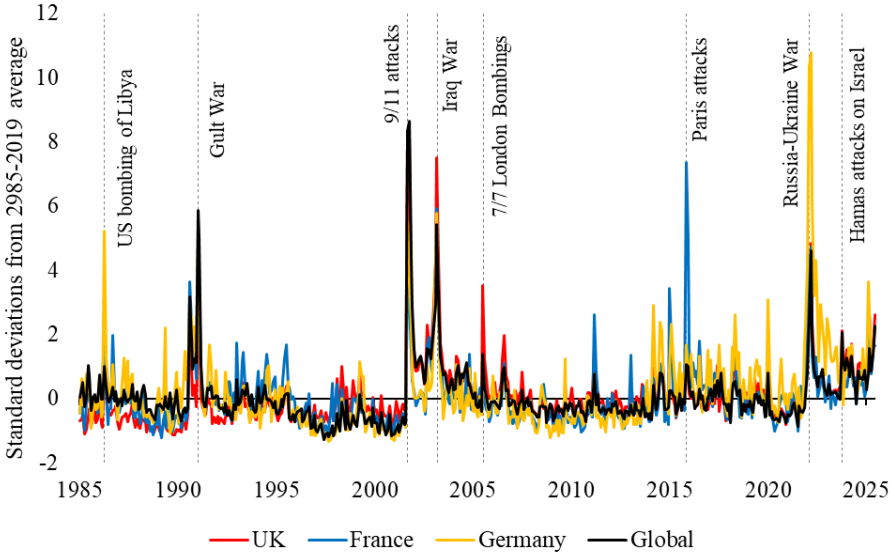
2 Empirical Setup

We estimate quantile local projections for a panel of countries, focusing on the response of (quantiles of) macroeconomic variables to country-level geopolitical risk indices $GPR_{i,t}$, where

i denotes country and t time. To identify country-level geopolitical *shocks*, we control for both a global geopolitical risk index GPR_t^w – constructed from the unweighted average of country-level series – as well as other macroeconomic controls. As Lloyd and Manuel (2024) show, in quantile-regression settings, this setup ensures that the estimated conditional responses to country-level geopolitical risk will be orthogonal to global moves and other contemporaneous macroeconomic factors.

We use a popular metric – the Geopolitical Risk (GPR) Index constructed by Caldara and Iacoviello (2022) – to quantify geopolitical tensions at the country-specific and global levels. Figure 1 plots the evolution of the global and country-level GPR indices over time. This shows that country-specific indices typically co-move significantly with the global index but may deviate when country-specific risks arise. For instance, the UK-specific (red line) and France-specific indices (blue line) show more pronounced spikes following terrorist attacks in London and Paris respectively.

Figure 1: Global and Country-Specific Geopolitical Risk Indices



Source: Caldara and Iacoviello (2022) and own calculations.

The conditional quantile function Q of the h-period-ahead change in the dependent variable $\Delta^h y_{i,t+h}$ for country i is:

$$Q_{\Delta^h y_{i,t+h}}(\tau \mid GPR_{i,t}, GPR_t^w, \mathbf{x}_{i,t}) = \alpha_i^h(\tau) + \beta^h(\tau) GPR_{i,t} + \gamma^h(\tau) GPR_t^w + \vartheta^h(\tau)\mathbf{x}_{i,t} \qquad (1)$$

where Q computes quantiles τ of the distribution of $\Delta^h y_{i,t+h}$ given covariates – where $\mathbf{x}_{i,t}$ denotes contemporaneous macroeconomic control variables and $\alpha^h(\tau)$ is a country- and quantile-

specific fixed effect controlling for time-invariant unobserved heterogeneity. $\beta^h(\tau)$ is the coefficient of interest, capturing the association between country-i geopolitical risk and quantiles τ of the dependent variable *orthogonal to* other covariates in equation (1).

To identify possible differences in underlying economic relationships, we estimate equation (1) for AEs and EMEs separately. We also test the extent to which responses are significantly different between AEs and EMEs by estimating the following variant of equation (1):

$$\begin{aligned} Q_{\Delta^h y_{i,t+h}}(\tau \mid GPR_{i,t}, GPR_t^w, \mathbf{x}_{i,t}) =& \alpha_i^h(\tau) + \beta_{AE}^h(\tau) GPR_{i,t} + \beta_{EM}^h(\tau) \left(GPR_{i,t} \times \mathbb{1}_i^{EME}\right) \\ &+ \gamma_{AE}^h(\tau) GPR_t^w + \gamma_{EM}^h(\tau) \left(GPR_t^w \times \mathbb{1}_i^{EME}\right) \\ &+ \vartheta_{AE}^h(\tau) \mathbf{x}_{i,t} + \vartheta_{EM}^h(\tau) \left(\mathbf{x}_{i,t} \times \mathbb{1}_i^{EME}\right) \end{aligned} \tag{2}$$

where $\mathbb{1}_i^{EME}$ is a dummy variable set to 1 if country i is an EME, and 0 otherwise. Here, $\delta^h(\tau)$ captures the extent to which the conditional response for EMEs differs to that from AEs.

We estimate these regressions using panel dataset covering 18 AEs and 9 EMEs, listed in Table 1. The time series runs from 1997Q4 to 2025Q1, to ensure that observations are available for all covariates for our countries of interest.

Throughout, we focus on the following dependent variables of interest (with growth rates annualised). The first two capture aggregate macroeconomic tail risk; the latter three, channels of transmission.

- GDP growth, specified as the h-period-ahead rate of (annualised) GDP growth, such that: $\Delta^h y_{i,t+h} \equiv \left(\frac{GDP_{i,t+h} - GDP_{i,t-1}}{GDP_{i,t-1}} \frac{4}{h+1}\right)$;
- CPI inflation: $\Delta^h y_{i,t+h} \equiv \left(\frac{CPI_{i,t+h} - CPI_{i,t-1}}{CPI_{i,t-1}} \frac{4}{h+1}\right)$;
- Import volumes growth: $\Delta^h y_{i,t+h} \equiv \left(\frac{MVOL_{i,t+h} - MVOL_{i,t-1}}{MVOL_{i,t-1}} \frac{4}{h+1}\right)$;
- Export price inflation: $\Delta^h y_{i,t+h} \equiv \left(\frac{PXDEF_{i,t+h} - PXDEF_{i,t-1}}{PXDEF_{i,t-1}} \frac{4}{h+1}\right)$;
- Change in 10-year government bond yields: $\Delta^h y_{i,t+h} \equiv (LR_{i,t+h} - LR_{i,t-1})$[1]

For each regression, our macroeconomic controls $\mathbf{x}_{i,t}$ include one lag of our variable of interest, real GDP, consumer prices, central bank policy rates and oil prices (all in four-quarter changes) – as in Caldara and Iacoviello (2022). For inference, we follow the block bootstrap procedure of Kapetanios (2008), resampling the data over blocks of different time series dimensions to generate coefficient standard errors for respective quantiles. We resample time series observations using 8 blocks, replicating the bootstrap 1000 times.

[1]The estimation sample for this variable is 2000Q4-2025Q1, and excludes China, Chile and Indonesia due to data availability.

Table 1: List of economies

Advanced Economies (AEs)	Emerging Market Economies (EMEs)
Australia	Brazil
Belgium	Chile
Canada	China
Denmark	Hungary
Finland	India
France	Indonesia
Germany	Mexico
Israel	Poland
Italy	South Africa
Japan	
Netherlands	
Norway	
Spain	
South Korea	
Sweden	
Switzerland	
United Kingdom	
United States	

Notes: Countries divided into Advanced and Emerging Market Economies as per IMF classification.

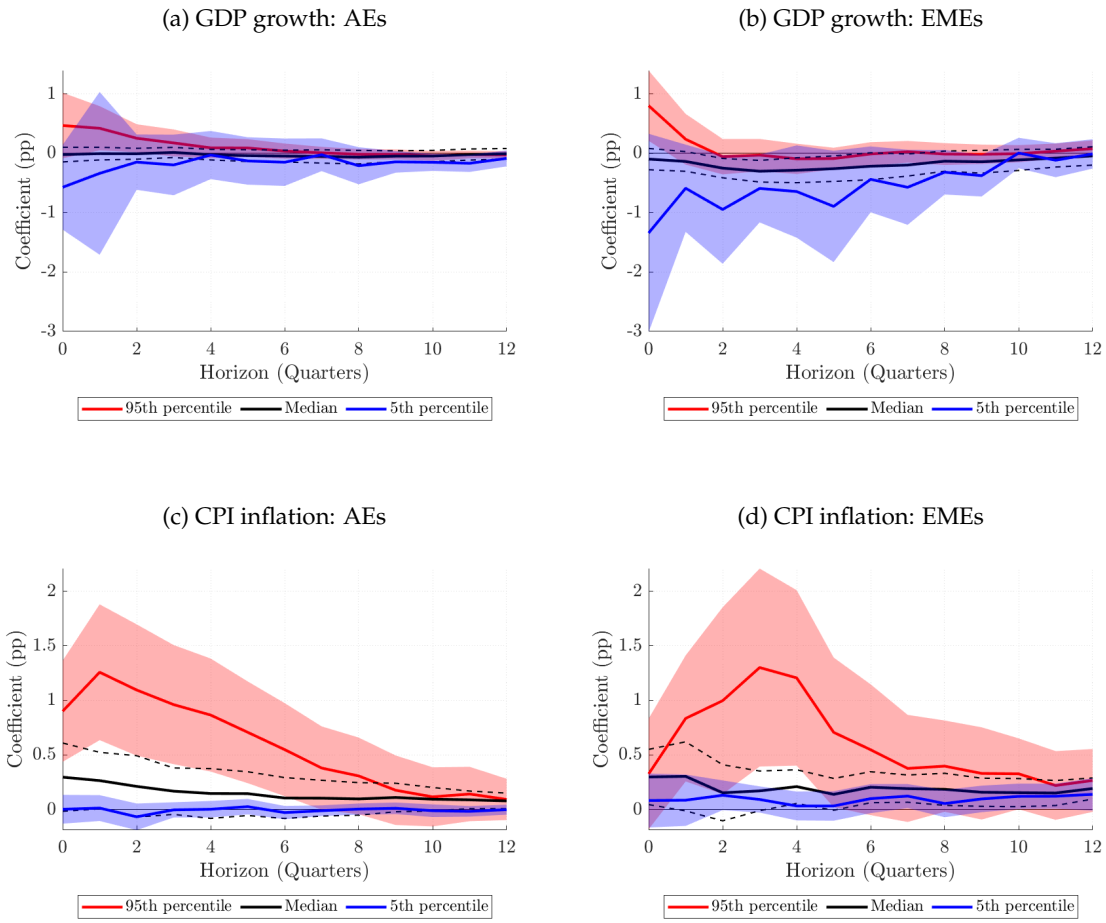
3 Aggregate Macroeconomic Tail Risks

Our quantile local projection approach highlights that geopolitical risk is associated with significant effects on GDP growth and inflation, for both median outcomes and tail risks.

Figures 2a and 2b show the impact of geopolitical risk on average annual GDP growth across AEs and EMEs respectively, while Table 2 summarises results at the first and fourth quarters following the shock ($h = 1$ and $h = 4$, respectively). At the median (black lines), a one standard deviation increase in geopolitical risks reduces GDP growth by around 0.1 percentage points (pp) across all economies. But at the 5th percentile – a one-in-twenty low growth outcome (blue line) – annualised GDP growth falls by just over 1pp on impact, though the impact moderates thereafter. This means that geopolitical risk both depresses median GDP growth and also increases the severity of left-tail outcomes. At the 95th percentile (red lines), geopolitical risk has near-zero effect on GDP growth after the first quarter.

The impact of geopolitical risks on GDP growth is heterogeneous across AEs and EMEs. For AEs, the median impact of geopolitical risk on GDP growth appears negligible, though the 5th percentile impact is more noticeable. For EMEs, however, both the median and 5th percentile impact of geopolitical risk are material. This result is consistent with Aiyar et al. (2023), who show that EMEs are also more sensitive to geoeconomic fragmentation in the medium-

Figure 2: Impulse responses of GDP growth and CPI inflation to geopolitical risk



Notes: Shaded areas denote 68% confidence interval using block bootstrapped standard errors.

term. Table 2 also shows that the impact of geopolitical risk on high-growth outcomes (95th percentile) is negligible across all groups of economies.

We also find that geopolitical risk tends to raise consumer price inflation, consistent with Caldara et al. (2024) and Pinchetti (2024). This suggests that on balance, geopolitical risk manifests as a mark-up shock, where inflationary channels dominate disinflationary channels. This could pose a challenging trade-off for a macroeconomic policymaker, between stabilising output versus inflation.

Table 2 shows that at the median, average annual inflation rises by around 0.3pp at peak, following a geopolitical risk shock. But at the 95th percentile, inflation rises by 1.2pp. The median inflationary impact of geopolitical risk shocks larger in EMEs and AEs. The 95th percentile impact is materially larger than the median for both groups of economies; right-tail inflation peaks later in EMEs, pointing to more protracted impacts than in AEs. Finally, the effect of

Table 2: Impact of geopolitical risk on GDP growth and CPI inflation

		h=1				h=4			
Var	Q	**All**	**AEs**	**ΔEMEs**	**EMEs**	**All**	**AEs**	**ΔEMEs**	**EMEs**
GDP	5th	-0.376	-0.338	-0.241	-0.589	-0.228	-0.03	-0.621	-0.645
		(0.811)	(1.371)	(1.814)	(1.622)	(0.447)	(0.405)	(0.71)	(1.02)
	50th	-0.061	-0.006	-0.135	-0.138	-0.106	-0.024	-0.298	-0.286
		(0.095)	(0.106)	(0.171)	(0.238)	(0.098)	(0.089)	(0.197)	(0.351)
	95th	0.322^{+}	0.42^{+}	-0.239	0.236	0.008	0.091	-0.196	-0.094
		(0.309)	(0.372)	(0.487)	(0.557)	(0.141)	(0.172)	(0.299)	(0.357)
CPI	5th	0.031	0.013	0.098	0.085	0.007	0.002	0.047	0.032
		(0.122)	(0.118)	(0.239)	(0.235)	(0.074)	(0.076)	(0.143)	(0.132)
	50th	0.279^{+}	0.264^{+}	-0.013	0.303	0.179	0.146	0.055	0.209^{+}
		(0.251)	(0.259)	(0.27)	(0.317)	(0.181)	(0.228)	(0.213)	(0.154)
	95th	1.094^{**}	1.258^{**}	-0.18	0.834^{+}	0.975^{*}	0.865^{*}	0.234	1.206^{+}
		(0.534)	(0.622)	(0.531)	(0.578)	(0.58)	(0.518)	(0.525)	(0.804)

Notes: Block bootrapped standard errors in parentheses; $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$, $^{+}p < 0.32$.

geopolitical risk at the 5th percentile is negligible across all groups of economies, suggesting that even under these circumstances, inflationary channels of geopolitical risk are at least as great as disinflationary channels.

4 Transmission Channels

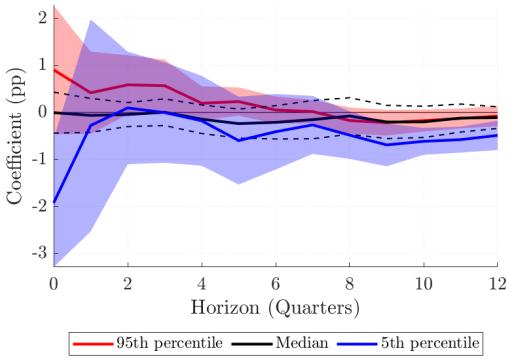
One key channel through which geopolitical risk could transmit to GDP and inflation is disruption to world trade. Aiyar et al. (2023) highlights trade as a key channel for the impact of medium-term trade fragmentation, while Liu et al. (2024) and Hou et al. (2024) find that geopolitical risk may have significant adverse effects on trade volumes and costs respectively.

Applying our quantile local projection framework to metrics of global trade, we also find that geopolitical risk leads to significant disruption in both median and tail-risk outcomes. Figures 3a and 3b plots the estimated impacts on trade volumes growth (measured by imports), while Figures 3c and 3d plots the impact on trade price inflation (measured by export price deflators). The peak response of trade volumes growth to geopolitical risk is around three times greater than GDP, at the median and 5th percentile. And the peak response of export price inflation – representing the basket of tradable goods and services – is significantly greater than that of consumer prices, at the median and 95th percentile.

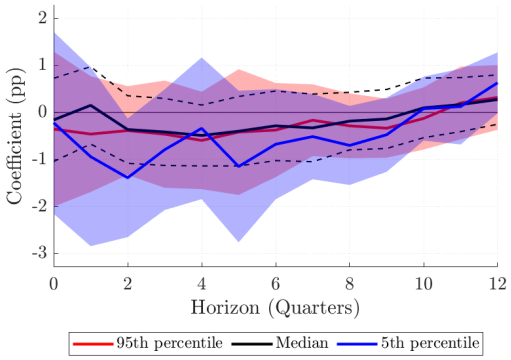
This implies that countries are likely to be exposed to global geopolitical risk via the effect on trading partners: falling import volumes for Country X means that Country Y's exports fall, weighing on GDP; higher export prices for Country X means that Country Y imports higher

Figure 3: Impulse responses of transmission channels of geopolitcial risk

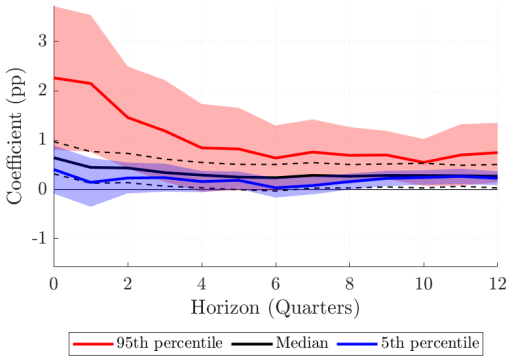
(a) Trade Volumes (MVOL): AEs



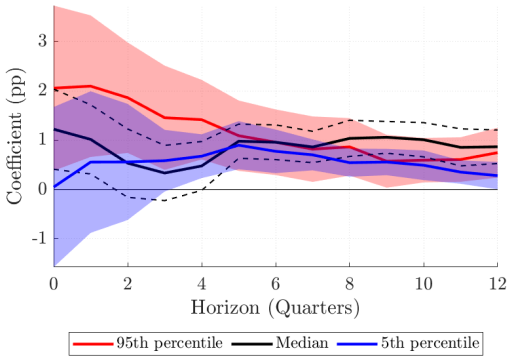
(b) Trade Volumes (MVOL): EMEs



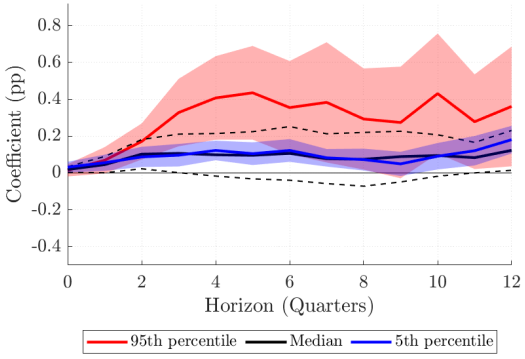
(c) Trade Prices (PX): AEs



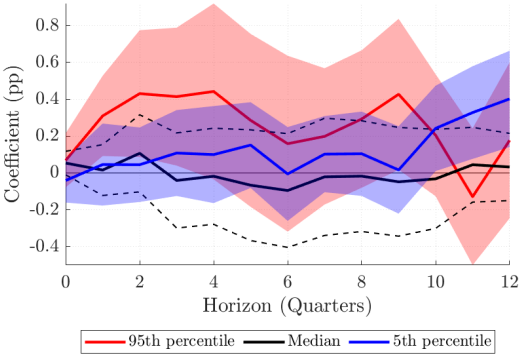
(d) Trade Prices (PX): EMEs



(e) 10-year government bond yield (LR): AEs



(f) 10-year government bond yield (LR): EMEs



Notes: Shaded areas denote 68% confidence interval using block bootstrapped standard errors.

inflation from Country X.

This combination of response of trade volumes and prices may partly be accounted by the well-documented effects of geopolitical risk on global commodity markets, particularly energy (Caldara et al., 2024). In particular, Pinchetti (2024) finds that more energy-intensive sectors in the US, which typically characterises tradable sectors, experience falls in output and increases in prices following geopolitical energy shocks.

In addition, these figures – together with Table 3 – show that trade volumes and prices are more sensitive in EMEs than AEs, across time and quantiles. This result is consistent with the results shown in Table 2: the larger response of GDP growth in EMEs transmits to the volume of imported goods and services; and the larger CPI response transmits to export prices via domestic costs. This also implies that economies that trade more with EMEs are likely to be more exposed to spillovers from global geopolitical risk.

Last we examine financial channels of geopolitical risk, which all else equal are likely to be disinflationary. Figures 3e and 3f show that 10-year government bond yields increase in response to an increase in geopolitical risk. At the 95th percentile, the response of bond yields is around twice as great compared to the median, and also more persistent. This aggregate response is largely mirrored in the sample of advanced economies. For EMEs, the median response is negligible, though the 95th percentile response is larger than AEs one quarter after the shock and statisticlaly significant (as Table 3 shows). It is plausible that the estimated response of long-term bond yields reflects widening term premia as geopolitical tensions rise. However, considering that geopolitical risk also tends to push up on inflation, this response is also likely to reflect the transmission of higher policy rates through the yield curve.

Taken together, our results imply that geopolitical risks manifest primarily via supply channels. This is particularly the case for EMEs, which appear most vulnerable to supply disturbances related to global trade. All else equal, these supply disturbances weigh on demand via lower real incomes and tightening financial conditions.

5 Conclusion

We present empirical evidence quantifying the macroeconomic effects of geopolitical developments. Geopolitical risks manifest as a supply shock that reduces GDP growth and increases inflation. The estimated impacts on GDP-at-risk (left tail) and inflation-at-risk (right tail) are materially greater than the respective median outcomes, and appear particularly significant for EMEs. Global trade is a key transmission channel, whereby geopolitical risk depresses trade volumes and raises trade prices in central case and tail risk outcomes, consistent with

Table 3: Impact of geopolitical risk on trade, uncertainty and financial Conditions

		h=1				h=4			
Var	Q	**All**	**AEs**	**ΔEMEs**	**EMEs**	**All**	**AEs**	**ΔEMEs**	**EMEs**
MVOL	5th	-0.462	-0.275	-0.608	-0.939	-0.323	-0.175	-0.08	-0.336
		(1.236)	(2.255)	(2.903)	(1.903)	(1.001)	(0.955)	(1.188)	(1.507)
	50th	0.024	-0.06	0.189	0.153	-0.257	-0.142	-0.313	-0.489
		(0.4)	(0.36)	(0.799)	(0.822)	(0.352)	(0.304)	(0.611)	(0.648)
	95th	0.174	0.42	-0.869	-0.458	-0.082	0.198	-0.732	-0.594
		(0.743)	(0.873)	(1.525)	(1.231)	(0.342)	(0.359)	(1.086)	(1.036)
PX	5th	0.162	0.144	0.36	0.555	0.341^{+}	0.16	0.541^{+}	0.674^{+}
		(0.632)	(0.494)	(1.28)	(1.435)	(0.231)	(0.214)	(0.444)	(0.444)
	50th	0.596^{+}	0.448^{+}	0.569^{+}	1.015^{+}	0.378^{+}	0.291^{+}	0.254	0.477
		(0.395)	(0.321)	(0.521)	(0.702)	(0.291)	(0.257)	(0.423)	(0.496)
	95th	2.367^{*}	2.15^{+}	-0.08	2.095^{+}	0.863^{+}	0.843	0.6	1.415^{*}
		(1.287)	(1.388)	(1.775)	(1.434)	(0.818)	(0.891)	(0.899)	(0.807)
LR	5th	0.074^{+}	0.056^{+}	-0.033	0.046	0.131^{*}	0.122^{**}	-0.034	0.1
		(0.06)	(0.044)	(0.216)	(0.223)	(0.074)	(0.053)	(0.261)	(0.264)
	50th	0.049^{+}	0.045^{+}	-0.027	0.016	0.094	0.099	-0.107	-0.018
		(0.048)	(0.044)	(0.117)	(0.138)	(0.122)	(0.116)	(0.206)	(0.261)
	95th	0.148^{+}	0.069	0.233^{+}	0.31^{+}	0.425^{*}	0.408^{*}	0.115	0.443
		(0.103)	(0.072)	(0.202)	(0.218)	(0.23)	(0.227)	(0.375)	(0.478)

Notes: Block bootrapped standard errors in parentheses; $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$, $^{+}p < 0.32$

the dynamics of a supply shock. Financial conditions also play a role.

Our results emphasise the importance of monitoring developments in geopolitical tensions. Not only do our findings imply that geopolitical risks can generate a trade-off for policymakers, between stabilising output versus inflation, but they can also generate significant macroeconomic tail risks – against which a policymaker may wish to insure.

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