Geopolitical Risk Perceptions[*]

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Abstract

Geopolitical risk cannot be measured in a universal way. We develop new geopolitical risk indicators relying on local newspaper coverage to account for different perceptions. Using Russia as a case study, we demonstrate that geopolitical risk shocks identified from local news sources have significant adverse effects on the Russian economy, whereas geopolitical risk shocks identified from English-language news sources do not. We control for restricted press freedom by analyzing state-controlled and independent media separately. Employing a novel Russian sanctions index, we illustrate that geopolitical risk shocks propagate beyond the sanctions channel. Still, sanctions worsen the inflationary impact of geopolitical risk shocks substantially.

Keywords: geopolitical risk, risk perceptions, Russia, sanctions, shock transmission

JEL classification: E32, E44, E71, F44, F51, G41.

1 Introduction

The Russo-Ukrainian War underlines, once more, the economic, but also human, social, and political costs of adverse geopolitical events. It is therefore important to track and analyze geopolitical risk (henceforth GPR), defined as the "threat, realization, and escalation of adverse events associated with wars, terrorism, and any tensions among states and political actors that affect the peaceful course of international relations" (Caldara and Iacoviello, 2022).[1] However, even if there is agreement on what constitutes an adverse geopolitical event, we show that GPR cannot be captured in a universal way due to differing GPR perceptions across nations.

Several factors may affect how economic actors perceive GPR in a particular nation, as vividly illustrated by the Russian invasion of Ukraine. First, the perception of GPR depends on the degree of a nation's involvement or stake in a specific conflict.[2] Second, to the instigator of a particular adverse geopolitical event, the possible imposition of sanctions can be an important determinant of GPR perceptions. Third, the way GPR is interpreted by local media is strongly determined by the degree of press freedom in a particular country. Clearly, the selection of events that are reported and how they are covered, affect the perception of GPR.[3]

To understand the importance of those factors, we extend the seminal work by Caldara and Iacoviello (2022, hereafter CI), distinguishing perceptions (or views) in the measurement of geopolitical risk. Using Russia as a case study, we construct a monthly news-based geopolitical risk measure that is based on Russian news (Russian GPR index), rather than on sources from the United States, United Kingdom, and Canada as proposed by CI. We call the original GPR measure proposed by CI the "Anglosphere" GPR index, given the origin of its news sources. We also develop a Ukrainian and a German GPR index, similarly exploiting country-specific news sources. This allows us to compare geopolitical risk from a Russian perspective with GPR measured from the viewpoint of other countries. To control for media bias in Russia, we separate the available news sources into two groups, state-controlled and independent, and construct two separate GPR indices based on these two types of media outlets. Finally, following Laudati and Pesaran (2023), we develop a novel news-based sanctions intensity index for Russia that helps us to analyze the interplay of GPR and sanctions. Indeed, a country's exposure to sanctions, its level of press freedom, and its involvement in conflicts likely shape perceptions of GPR. These factors are particularly relevant for Russia, which is why we focus on Russia in this paper. Our study then investigates whether GPR perceptions influence geopolitical risk measurement, which

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[1] Note that, although we use the term "geopolitical risk shocks" as coined by Caldara and Iacoviello (2022), we think of these shocks as first-order moment shocks rather than second-moment shocks.

[2] Mogliani et al. (2022) and Federle et al. (2022) show that Russia's invasion of Ukraine had more severe economic consequences for countries closer to Russia.

[3] Simonov and Rao (2022) describe an example of how the coverage of the same event by government-controlled and independent media in Russia can differ drastically.

could ultimately affect our assessment of how geopolitical risk shocks are transmitted to the macroeconomy and financial markets.

Our findings highlight the importance of local factors to accurately capture GPR as it is perceived within Russia. First, we show that our Russian GPR measure evolves markedly differently relative to other GPR measures that are based on English-language, German or Ukrainian news sources. Furthermore, we show that a sudden rise in the Russian GPR measure has strong adverse effects on the Russian economy, whereas a shock to the Anglosphere GPR measure does not. An adverse Russian GPR shock affects several dimensions of the Russian economy. Among others, output drops strongly, while prices and interest rates rise substantially.

Second, we show that Russian GPR shocks have negative effects on the Russian economy beyond the sanctions channel. Unsurprisingly, a Russian GPR shock has a large impact on the sanctions intensity. However, we show that the impact of geopolitical risk on activity remains robust and strong even when shutting down the sanctions channel in our counterfactual exercise. We find that sanctions matter in that they exacerbate the inflationary effects of geopolitical risk and, therefore, the associated rise in policy rates.

Finally, our results point to a minor role of media bias for the transmission of geopolitical risk shocks in Russia. An independent media-based Russian GPR shock has marginally weaker adverse effects on the Russian economy than does a shock to the state-controlled news-based Russian GPR index.

CI pioneer the development of a news-based geopolitical risk indicator. Their work shows that higher geopolitical risk matters for the economy. GPR shocks lower output, investment, and stock prices, while increasing inflation. Additionally, Caldara et al. (2023) show that the inflationary impact of higher commodity prices and currency depreciation offsets other potential deflationary effects in response to GPR shocks. Building on these foundational papers, we contribute by establishing the importance of country-specific perceptions when assessing geopolitical risk. Moreover, we uniquely integrate the analysis of sanctions, examining their role within the broader context of geopolitical risk.

It is crucial to note that while CI's general GPR indicator (in our paper: Anglosphere GPR index) offers a global measure of geopolitical risk, CI also develop country-specific indicators. However, these indicators provide a markedly distinct interpretation of geopolitical risk compared to our indices. CI's country-specific indicators are designed to capture geopolitical risks directly involving – or at least referencing – the specific country, modifying the original search phrase (see Section 2) by requiring that the articles also include the name of the country or its capital (or main city). Moreover, these indicators inherently reflect an Anglosphere perspective, as they are derived from a selection of US newspapers. To assess the distinctiveness of our approach, we present an extensive comparison of our global GPR indices based on country-specific news sources with the CI country-specific GPR indices in Appendix D. That analysis clearly shows that the two sets of measures capture distinct forms of geopolitical risk. Specifically, the CI country-specific indices do not

closely proxy the geopolitical risk as captured by our indices. This underscores the value of incorporating local news sources and perceptions in the measurement of geopolitical risk.

From a methodological point of view, our indicators belong to the class of news-based indicators using textual analysis. Baker et al. (2016) explore this approach to derive an economic policy uncertainty index. Subsequent research has underlined the relevance of news-based indices as they can improve macroeconomic forecasts (Thorsrud, 2020; Shapiro et al., 2022; Kalamara et al., 2022), and help monitor economic activity in real time and at a daily frequency (Aguilar et al., 2021). A particular related indicator is from Laudati and Pesaran (2023) who construct a news-based index that measures the intensity of sanctions in Iran. Their study is based on news sources from the United States and the United Kingdom. We build upon their work to develop a sanctions intensity index for Russia, however using local news sources.

Shocks to geopolitical risk are rather distinct from uncertainty shocks, which Bloom (2009) shows to be of major importance in explaining business cycle fluctuations. Uncertainty shocks refer to changes either in macroeconomic uncertainty or in the dispersion of firm-level outcomes (Kozeniauskas et al., 2018). They act as aggregate demand shocks, depressing both output and prices (Basu and Bundick, 2017; Leduc and Liu, 2016). The geopolitical risk shocks that we identify here are instead akin to supply disturbances; they push up inflation while lowering output, a finding that is consistent with Caldara et al. (2023).[4]

Our study also connects to the economic costs of wars and geopolitical conflicts, as for example in Ohanian (1997) or Barro (2006). One focus in this literature has been on the implications of trade, as for instance in Glick and Taylor (2010). With respect to the Russo-Ukrainian war, several studies, e.g. Ahn and Ludema (2020), Crozet and Hinz (2020), Mamonov et al. (2021), and Huynh et al. (2023) among others, disentangle the effect of sanctions on the Russian economy. Another economic dimension for this war is captured in Antezza et al. (2022), who quantify the military contribution to Ukraine from different countries.

The remainder of the paper is structured as follows. In Section 2, we describe how we construct our GPR indices. Section 3 provides descriptive statistics and shows how the language and the media sources affect the time series that we obtain. Then in Section 4, we analyze the effects of GPR shocks on macroeconomic and financial market variables in Russia using vector autoregression analysis. Section 5 sheds light on the role of sanctions in the transmission of geopolitical risk shocks. Finally, Section 6 concludes.

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[4] Grebe et al. (2024) propose a Twitter-based measure of uncertainty about the war in Ukraine. They show that a rise in this uncertainty measure raises expected inflation and depresses output in Germany.

2 Construction of geopolitical risk indicators using country-specific news sources

This section describes how we construct GPR indicators using country-specific news sources for Russia, Ukraine, and Germany. Building on the procedure of CI, we use textual analysis to construct news-based GPR indicators. Each index measures the share of articles containing one or more words associated with geopolitical threats or events during a month relative to the universe of articles from a selected set of newspapers.

Importantly, we construct geopolitical risk indicators using local news sources in the language of the country under study. Incorporating local factors, specifically language and media, in measuring GPR sets our indicators apart. In contrast to this, the GPR index of CI arguably reflects geopolitical risk from an Anglosphere perspective as it is based on English-language newspapers only (six from the United States, three from the United Kingdom and one from Canada). To emphasize this different perspective, we denote their seminal indicator Anglosphere GPR.

Table 1 summarizes the news sources underlying our GPR indices. Utilizing the Dow Jones Factiva global news repository, we construct GPR indicators by sourcing information from local news outlets in the native language of the country under investigation.[5] In adherence to the methodology proposed by Andres-Escayola et al. (2022), we opted for newspapers with the highest circulation in each country from the Factiva database, ensuring broad press coverage when building text-based indicators. Tabloids and regional newspapers were excluded for the sake of comparability.

In constructing our GPR indicators, we also adapt CI's search query to the language and specifics of each country studied.[6] To take into account the specifics of the Slavic languages, we use a dictionary of synonyms, which provides us with a set of alternatives ranked by popularity. This way, we ensure that the search query contains only the most popular candidates. As an example, consider the translation of the word "war" into Russian. The four most popular synonyms for the word war ("война") based on the dictionary are "Великая Отечественная война", "военные действия", "борьба", and "боевые действия". However, it turns out that not all of these words are actually related to geopolitical risk. The word "Великая Отечественная война" means Second World War, while the word "борьба" is mostly used in the context of sports competitions. Therefore, we exclude these two words. The query then contains the initial word for war "война" and only the two relevant synonyms "военные действия" and "боевые действия". To be precise, our query contains only a part of the word "war", namely "войн*" so that we simultaneously also cover its plural form ("войны"). Appendix A shows the search query for each country.

For Russia, we also have to account for the limited press freedom and thus the dif-

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[5] Note that access to Factiva necessitates the acquisition of a commercial license.

[6] See Appendix A.1 for details on the search queries underlying the Russian, Ukrainian and German GPR indices.

Table 1: Newspaper sources underlying geopolitical risk indices

Country	Sources
Anglosphere	Guardian, Daily Telegraph, Financial Times, Globe and Mail, Chicago Tribune, Los Angeles Times, New York Times, USA Today, Wall Street Journal, Washington Post
Russia	*State-controlled media*
	Argumenty i Fakty, Argumenty nedeli, Izvestia, Kommersant, Komsomolskaya Pravda, Moskovskii Komsomolets, Parlamentskaya gazeta, Profil, Rossiyskaya Gazeta, Vedomosti
	Independent media
	7x7 – Horizontal Russia, Echo of Moscow (banned in Russia since March 2022), Fontanka.ru (recognized as a foreign agent in Russia since October 2021), Grani.ru (banned in Russia since March 2014), Mediazona (banned in Russia since March 2022), Meduza (recognized as a foreign agent in Russia since April 2021), Novaya Gazeta (banned in Russia since March 2022), Republic (banned in Russia since March 2022), The Project (banned in Russia since June 2021), TV Dozhd (banned in Russia since March 2022)
Ukraine	bigmir.net, Golos Ukrainy, ICTV TV Channel, Interfax, Korrespondent.net, liga.net, Minfin, Obozrevatel, RBC-Ukraine, Ukrainian News (http://un.ua/), Ukrinform, Unian
Germany	Frankfurter Allgemeine Zeitung, Süddeutsche Zeitung, Handelsblatt, Die Welt, taz
United Kingdom	Guardian, Daily Telegraph, Financial Times
USA	Chicago Tribune, Los Angeles Times, New York Times, USA Today, Wall Street Journal, Washington Post

ferent nature of newspapers in circulation. The World Press Freedom Index published by Reporters Without Borders in 2024 ranked Russia 162nd out of 180 countries.[7] We construct the Russian GPR index using state-controlled media and independent media jointly.[8] Additionally, we build media-specific indicators that only rely on state-controlled and independent newspapers, respectively. Note that, at the time of writing, all but one of the independent media sources listed in Table 1 were banned or recognized as foreign agents in Russia. Appendix B provides more details on the chosen state-dependent and independent media outlets.

In addition to our GPR indicators based on country-specific news sources, we replicate the Anglosphere GPR indicator utilizing the Factiva database and use the replicated indicator in our analysis.[9]

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[7] The World Press Freedom country ranking can be found at https://rsf.org/en/index?year=2024 (last accessed: 07/05/2024).

[8] An overview of independent media sources in Russia can be obtained here: https://like-a.ru/hozyajke-na-zametku-polnyj-spisok-iz-17-a/ (last accessed: 12/01/2022).

[9] Since the Factiva newspaper archive has limitations on the length of the search query, we adapt our search query relative to CI; see Appendix A for more details. Our Anglosphere GPR series therefore does not

3 Geopolitical risk: perceptions matter

This section demonstrates that measures of geopolitical risk are not universal. Instead, they depend critically on the underlying perception of geopolitical risk, as reflected in a country's news reporting. First, taking a country-specific perspective results in a rather different indicator of geopolitical risk as compared to the Anglosphere GPR index. Using Russia as a case study, we show that the location where geopolitical threats or acts originate is clearly important for how agents perceive the risk associated with such events. Second, we draw attention to the importance of the type of media sources that underlie our local GPR indicator. In particular, state-controlled media and independent media outlets can report differently about the same geopolitical events in non-democratic countries, as we demonstrate for Russia.

3.1 Geopolitical risk measures derived from local news sources

Figure 1 shows geopolitical risk as perceived in Russia together with the Anglosphere GPR index from June 2002 to December 2022.

Figure 1: Geopolitical risk as perceived in Russia versus the Anglosphere

The difference in the levels of the two indices stands out immediately. The Russian

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replicate the original GPR index from CI perfectly. However, the two series are almost perfectly correlated; their correlation coefficient is equal to 0.96.

GPR index is roughly twice as high as the Anglosphere GPR index. This could mean that Russian media use in general more words related to geopolitical risk than do English-speaking media. It could, however, also simply be associated with the specifics of the Russian language, which would then be unrelated to geopolitical risk measurement.[10]

Therefore, we focus on the differing dynamics of the two series. For instance, the spike in the Russian GPR series pertaining to the Russo-Georgian War in 2008 clearly stands out from the rest of the series. Also, Euromaidan followed by the Russo-Ukrainian War in 2014 are visible as an upward level shift in the Russian GPR index. In contrast, the Anglosphere GPR series, excluding the large spike at the time of the Iraq War and up to the end of 2021, has only much smaller spikes. Furthermore, the Anglosphere GPR does not remain elevated after the annexation of Crimea, pointing to a unique persistent increase of geopolitical risk as perceived in Russia.

Importantly, the differing dynamics are not limited to the Russian and Anglosphere GPR indices, as we can see from Table 2. The table shows the correlation coefficients of our GPR series for Russia, Ukraine, Germany, the United States and the United Kingdom, together with the Anglosphere GPR. The sample period is from July 2002 until December 2021. Clearly, the series are far from perfectly correlated with each other and with the Anglosphere GPR index. For instance, the United Kingdom's and United States' GPR indices are not perfectly correlated. This indicates a difference in the perception of geopolitical risk even between two countries that share a common language and are quite closely connected economically. Extending the series until the end of December 2022 increases the correlation among the indices significantly.[11] The reason, of course, is the geopolitical risk shock related to the Russo-Ukrainian War.

Table 2: Correlation matrix of GPR indices for different countries

GPR index	Russia	Anglosphere	Ukraine	Germany	United Kingdom	United States
Russia	1.00	0.43	0.71	0.43	0.37	0.42
Anglosphere	0.43	1.00	0.05	0.85	0.92	0.99
Ukraine	0.71	0.05	1.00	-0.02	-0.05	0.06
Germany	0.43	0.85	-0.02	1.00	0.84	0.83
United Kingdom	0.37	0.92	-0.05	0.84	1.00	0.88
United States	0.42	0.99	0.06	0.83	0.88	1.00

Notes: The sample period for the correlation coefficients is July 2002 until December 2021, i.e. excluding the Russo-Ukrainian War.

Consider the time series of the five GPR indices for Russia, Ukraine, Germany, United

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[10] For instance, in constructing the GPR indicators, CI propose dividing the number of articles related to geopolitical risk by the total number of articles. Therefore, a higher level could also be associated with a different measurement of the total number of articles, in turn being unrelated to geopolitical risk. Against this backdrop, we perform robustness checks with respect to different measurements for the total number of articles. Results remain qualitatively the same and are available upon request.

[11] See the corresponding correlation table in Appendix C.

Kingdom and United States depicted in Figure 2. The figure shows a distinction between Russia and Ukraine, on the one hand, and Germany, United States and United Kingdom, on the other. The former GPR indicators exhibit much greater variability than do the latter three. This pattern suggests that proximity to – and involvement in – geopolitical tensions matters greatly for how the associated risk is perceived and thus, measured. Since 2014, geopolitical tensions affecting Russia and Ukraine are causing large swings in the corresponding GPR indices. Before the Russian invasion of Ukraine in February 2022, these tensions apparently did not affect much the GPR indicators of Germany, the United States and the United Kingdom.
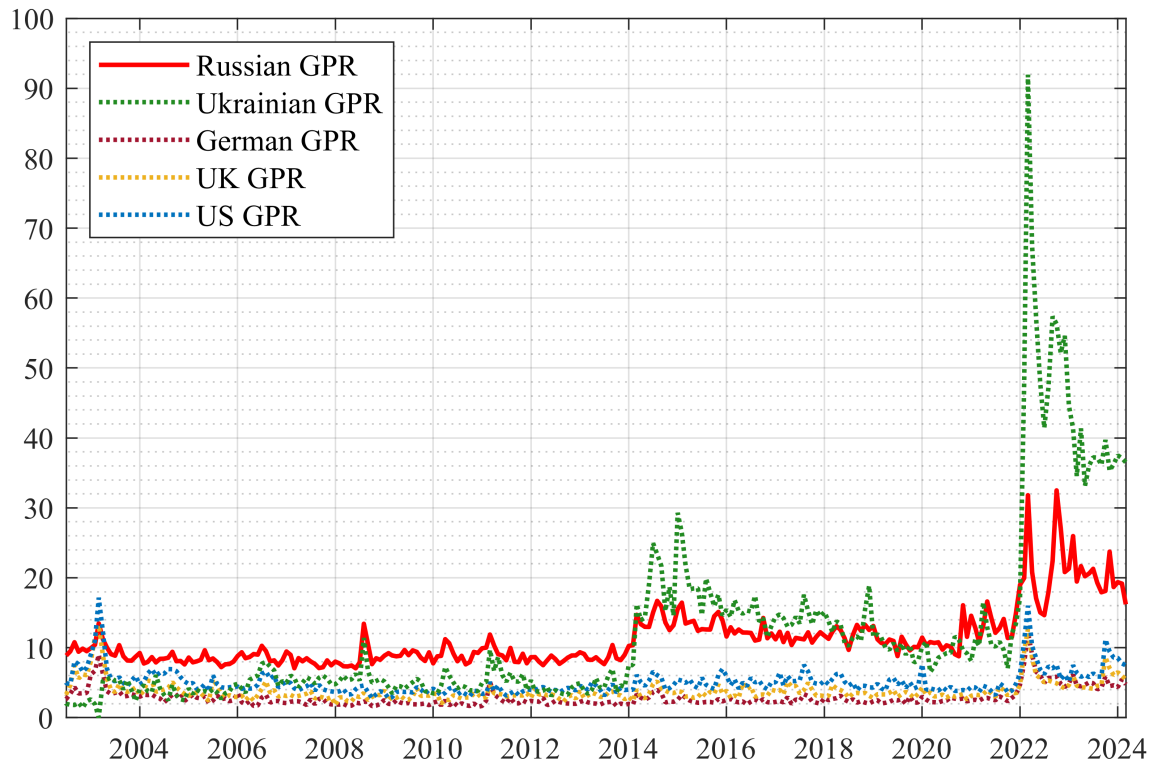

Figure 2: Geopolitical risk indicators based on local news sources for selected countries

Figure 3 zooms in on the most recent period, starting in July 2021 and showing the months leading up to the Russian invasion of Ukraine in February 2022. We compare in this figure the local GPR indices for Russia and for Ukraine with the Anglosphere GPR. The first thing to note in Figure 3 is the increase in the GPR indices already in January 2022. This suggests that indications of an imminent geopolitical event were transported by the press both in Russia and in the United States. The most remarkable observation, though, is the steep rise in the Ukrainian GPR index in the same month, suggesting that the geopolitical threat was identified as such by Ukrainian media. In this instance, the Ukrainian GPR index can be regarded as a leading indicator for the Anglosphere and Russian counterparts. This exercise hence underlines the value in considering GPR

indicators constructed from local news sources in addition to a GPR index based solely on English-speaking newspapers.
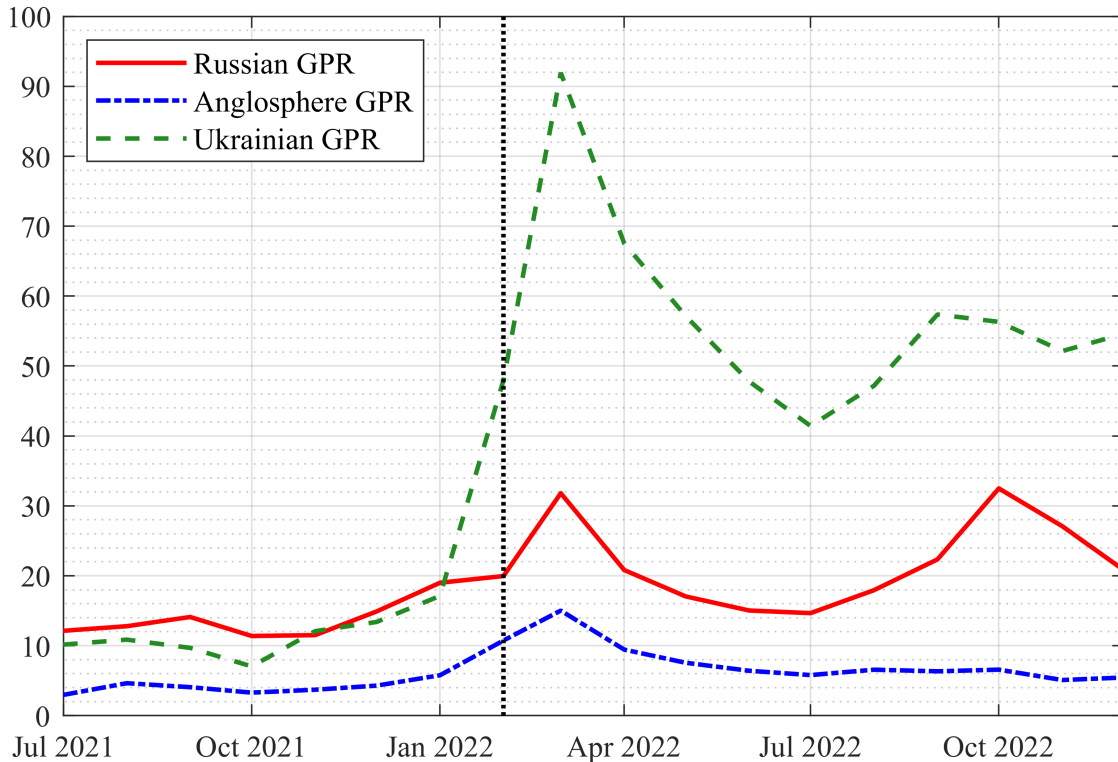

Figure 3: Geopolitical risk perceptions around the Russian full-scale invasion of Ukraine

3.2 State-controlled vs independent Russian media

Table 3 lists all geopolitical events that are relevant from a Russian perspective, starting in July 2002. In addition, the table classifies these events as more or less important according to state-controlled and independent Russian news sources. More specifically, the table indicates which events are associated with an increase in the GPR index by one-half, one or two standard deviations. It does so for the Russian GPR index, the Anglosphere GPR index, the Russian GPR index based on state-controlled media and the Russian GPR index based on independent media.

We see from Table 3 that not all geopolitical events are regarded as equally important by the English-speaking press and by the different types of Russian media sources. Only one event, marked in yellow, is characterized by a two-standard-deviation spike in all four GPR series (the Russian annexation of Crimea in 2014). Those events that are classified as geopolitically relevant by two or three out of the four GPR indicators are marked in green. The war in Georgia, the full-scale Russian invasion of Ukraine and the partial mobilization in Russia in September 2022 show up as important geopolitical events according to the different Russian GPR indicators, but play a minor role for the English-speaking world.

Table 3: Geopolitical events Russia: comparison across types of sources

Data	Event description	Type of press		
		2 SD	1 SD	1/2 SD
September 2002	War fears US/Iraq	A	A, RI	All
March 2003	Iraq war	RS	A, RS, R	All
August 2003	Aggravation of hostilities in Iraq and Afghanistan	RI	RI, RS, R	All
July 2005	London bombings 7/7	A	A	All
August 2008	War in Georgia	RI, RS, R	RI, RS, R	All
March 2011	Georgia-EU visa facilitation. Earthquake in Japan. Civil war in Syria	A	All	All
March 2014	Military actions on the territory of Donbas (Ukraine). Annexation of Crimea. Anti-war protests in Russia	All	All	All
November 2015	Paris terrorist attacks	A	A	All
August 2019	Termination of the Intermediate Nuclear Forces Treaty between Russia and the United States. Protests in Moscow	RS	RS, R	A, RS, R
January 2020	US/Iran tensions escalate	A	A	All
November 2020	Second Karabakh War. Signing of a ceasefire agreement in the Nagorno-Karabakh region	R	R	A, RS, R
August 2021	Terrorist attack at Kabul airport, Afghanistan. US completes 20-year mission in Afghanistan	A	A, RS	All
February 2022	Full-scale invasion in Ukraine	A, RS	A, RI, RS	All
March 2022	War in Ukraine. Moldova and Georgia apply for EU membership. The Council of Europe officially expels Russia from the organization	RS	A, RS, R	A, RS, R
September 2022	Partial mobilization in Russia. Nord Stream and Nord Stream 2 accidents. Annexation of the occupied territories of Ukraine	RI, RS	RI, RS, R	RI, RS, R
October 2022	Explosion on the Crimean Bridge. Massive missile strikes in Ukraine	RI, R	RS, R	All
October 2023	Hamas attacks on Israel, beginning of war in Gaza	A	A, RI, RS	All

Notes: R - Russian GPR index; A - Anglosphere GPR index; RI - Russian GPR index, independent sources; RS - Russian GPR index, state-controlled sources. SD - Standard Deviation. Events classified as important by all types of press marked in yellow; events classified as important by two or three out of all types of press marked in green.

We investigate the role of press freedom (or the lack thereof) in Russia. We analyse how the way independent and state-controlled news outlets report about geopolitical events affects the resulting geopolitical risk perceptions.

Figure 4 depicts the Russian GPR series together with its two components, the Russian GPR index based on state-controlled media and the Russian GPR index based on independent media, as classified in Table 1.

The relatively high variability of the independent media GPR index stands out, as noted, for instance, by the spike at the Russo-Georgian war or the persistent rise after the annexation of Crimea.
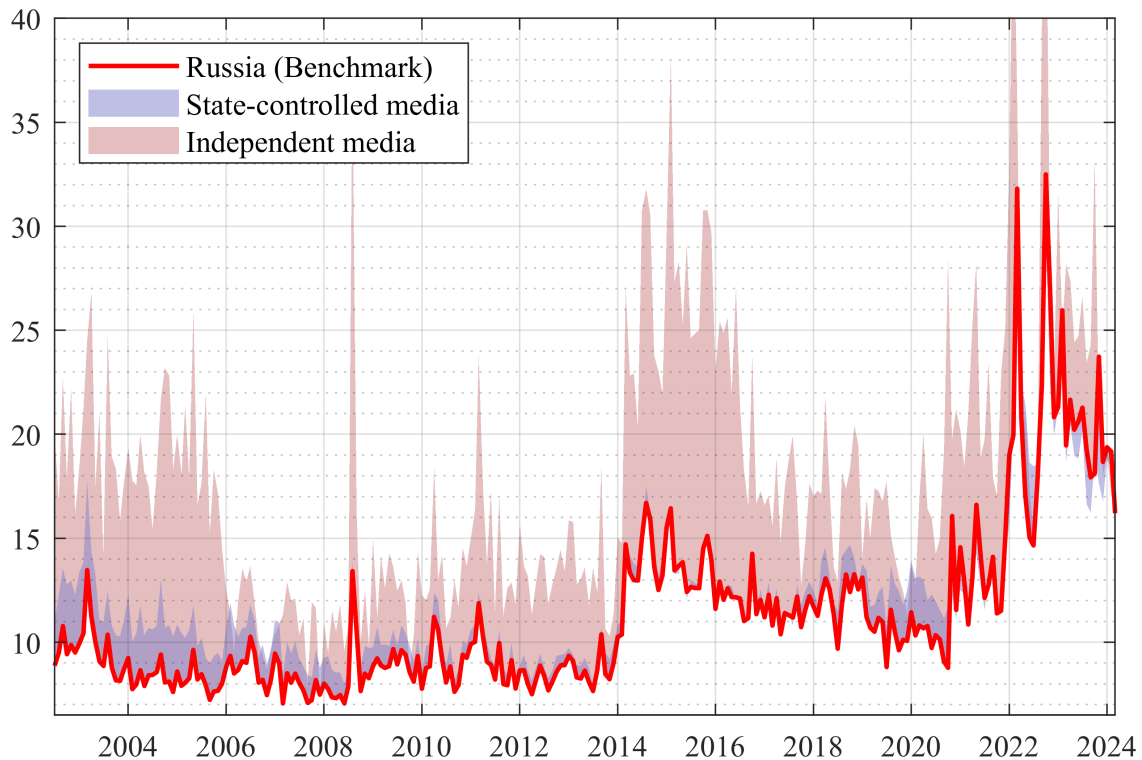
Figure 4: Geopolitical risk: state-controlled versus independent media sources

Overall, the GPR index based on state-controlled news sources is lower than that computed from independent sources. This discrepancy points to the existence of media biases in Russia. For instance, it is likely that state-controlled media mute geopolitical risk events by covering up or reporting euphemistically. It could also be that independent media report aggressively on geopolitical risk, so as to legitimize their role as independent media or to show their anti-government attitude. Clearly, both biases could exist simultaneously.

Nevertheless, both indicators are still quite related and both capture key geopolitical events. For instance, the war in Georgia or the partial mobilization in Russia in September 2022 show up as important geopolitical events in both indicators. Interestingly, these two events play only a minor role in the English-speaking world.

4 Geopolitical risk shocks and the Russian economy

We now investigate how a GPR shock is transmitted to the Russian economy and how this transmission depends on the measurement of geopolitical risk. We distinguish between the transmission of Russian and Anglosphere GPR shocks and assess how the underlying media's degree of freedom affects the impact. Finally, we assess the role of sanctions for the transmission of GPR shocks.

4.1 Data

In this section, we focus on data from 2002M7 until 2021M12. We stop the empirical analysis before the start of the Russo-Ukrainian War at the beginning of 2022 for two reasons. First, the war brought an increase in measures against the independent media in Russia. Clearly, fewer media sources, but also restricted reporting, could lead to mismeasurement of the independent news media GPR and, as a consequence, distort the comparison with the other GPR indices. Second, it is not clear whether and in which way Russian data is subject to misreporting after the start of the war.

Next to our Russian GPR index, we also consider the Anglosphere, the Ukrainian, and the German GPR index in this exercise. Furthermore, we employ a series of variables that capture different aspects of the Russian economy. First, we consider a set of real and policy variables, namely gross domestic product (GDP), the consumer price index (CPI), and the policy rate (IR). As for financial variables, we look at asset prices (equity and house prices), total credit volume, and a measure of realized volatility, derived from the sum of squared returns of equity prices, as a proxy for financial uncertainty. We measure equity prices via the Russian Trading System (RTS) index. Total credit volume reflects credit to the non-financial private sector.

Clearly, geopolitical risk also affects the Russian economy from an international perspective. Therefore, we also include a number of international variables. More specifically, we consider the real effective exchange rate (REER), sovereign risk spreads (SovSpread, Russian long-term bond minus a long-term bond of the United States), and Ural oil prices.

All data are in real terms and are seasonally adjusted. Furthermore, some data are only available at quarterly frequency. We convert these time series to monthly frequency by interpolation with a cubic spline. Please see Appendix E for data sources and further details.

4.2 Method: Bayesian structural vector autoregression

To analyze the impact of geopolitical risk shocks on the Russian economy, we consider a standard Bayesian structural vector autoregression (BSVAR) model (Waggoner and Zha, 2003).

Specifically, let y_t be an $n \times 1$ vector of economic variables at time $t = 1, \ldots, T$, C a vector of constants, $\mathcal{A}_0$ and $\mathcal{A}_l$ coefficient matrices of size $n \times n$, and ε_t an $n \times 1$ vector of exogenous structural shocks. p denotes the lag length. The model can be written as

$$y_t' \mathcal{A}_0 = C + \sum_{l=1}^{p} y_{t-l}' \mathcal{A}_l + \varepsilon_t'. \tag{1}$$

Structural innovations are normally distributed with $E(\varepsilon_t | y_1, \ldots, y_{t-1}) = 0$ and $E(\varepsilon_t \varepsilon_t' | y_1, \ldots, y_{t-1}) = \mathbf{I}_n$, where $\mathbf{I}_n$ denotes the identity matrix of size $n \times n$.

Since we use monthly data, we specify the lag length to be twelve. The Gibbs sampler proposed by Waggoner and Zha (2003) employs a Minnesota prior for all variables in the system. We adapt this assumption for the reduced-form equation of the GPR index. For this equation, we deviate from the random walk assumption and set the prior for the first lagged coefficient to 0.5 instead of 1. Since the GPR index is rather a stationary variable, the random walk assumption for this time series would likely overestimate the persistence for this variable. The hyperparameters of this prior are set close to the standard values (see, for example, Sims and Zha, 1998; Robertson and Tallman, 2001; Sims and Zha, 2006; Meinerding et al., 2022). Using the notation of Sims and Zha (1998), we set $\lambda_0 = 0.6$, $\lambda_1 = 2$, $\lambda_2 = 1.0$, $\lambda_3 = 1.2$, $\lambda_4 = 0.1$, $\mu_5 = 1.0$, and $\mu_6 = 1.0$. This means that we slightly increase the value for λ_1 (tightness of beliefs around the random walk prior), expressing less certainty around these beliefs. Note that this approach also uses dummy observations as part of the prior. Furthermore, we use 15,000 draws, of which we discard 5,000 as burn-in draws.

Our shock identification strategy closely follows the one taken by CI. In particular, we identify a GPR shock by imposing an upper triangular structure on A_0 and ordering the relevant GPR index first, estimating one model for each GPR index. This implies that a GPR shock can affect all variables in the system contemporaneously, while all other shocks in the system cannot directly affect the GPR index (see also Kilian and Lütkepohl, 2017).

There are two reasons for this assumption: First, as argued by CI, the GPR index captures events that are less likely to have an economic origin and that could lead to increased financial volatility and uncertainty. This supports the assumption that economic or financial shocks do not contemporaneously affect geopolitical risk but with a delay of at least one month. Second, assuming the same identification scheme as in CI allows us to establish comparability of results.

Given that no identification scheme is perfect in macroeconomics, there are of course situations where such an identification scheme might fail. For instance, given the rapid responses of financial variables, there might be instances where financial markets react immediately to geopolitical events, which might then also affect the GPR index contemporaneously. Additionally, in contexts like Russia, where the government may censor media, the GPR index might not immediately reflect certain events, meaning that a GPR shock could first move macroeconomic and financial variables before affecting the GPR index. Conversely, media discussions about potential conflicts could be initiated by the government in advance in order to prepare the economy and financial markets, thereby again supporting the Cholesky identification scheme.

Finally, we also check for robustness with respect to our shock identification scheme using narrative sign restrictions as proposed by Antolín-Díaz and Rubio-Ramírez (2018).[12] For this, we consider the onset of the Russo-Georgian War (August 2008) and the Russo-

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[12]In doing so, our paper follows other recent contributions that use narrative sign restrictions in political contexts as well, such as Drechsel (2024).

Ukrainian War (March 2014) as narrative events. Overall, the main conclusions remain the same. Please see Appendix G for further details.

4.3 Transmission of geopolitical risk shocks

This section analyzes how geopolitical risk shocks are transmitted to the Russian economy. We first assess the dynamics in response to Russian GPR shocks and then contrast the results with the Anglosphere indicator. Second, we compare the responses to state-controlled media GPR shocks with responses to independent media GPR shocks. Figures 5 to 7 show our estimated impulse responses, tracing out the impact of a GPR shock on the Russian economy up to 24 months after the shock. Throughout the analysis, we consider a positive GPR shock of one standard deviation.
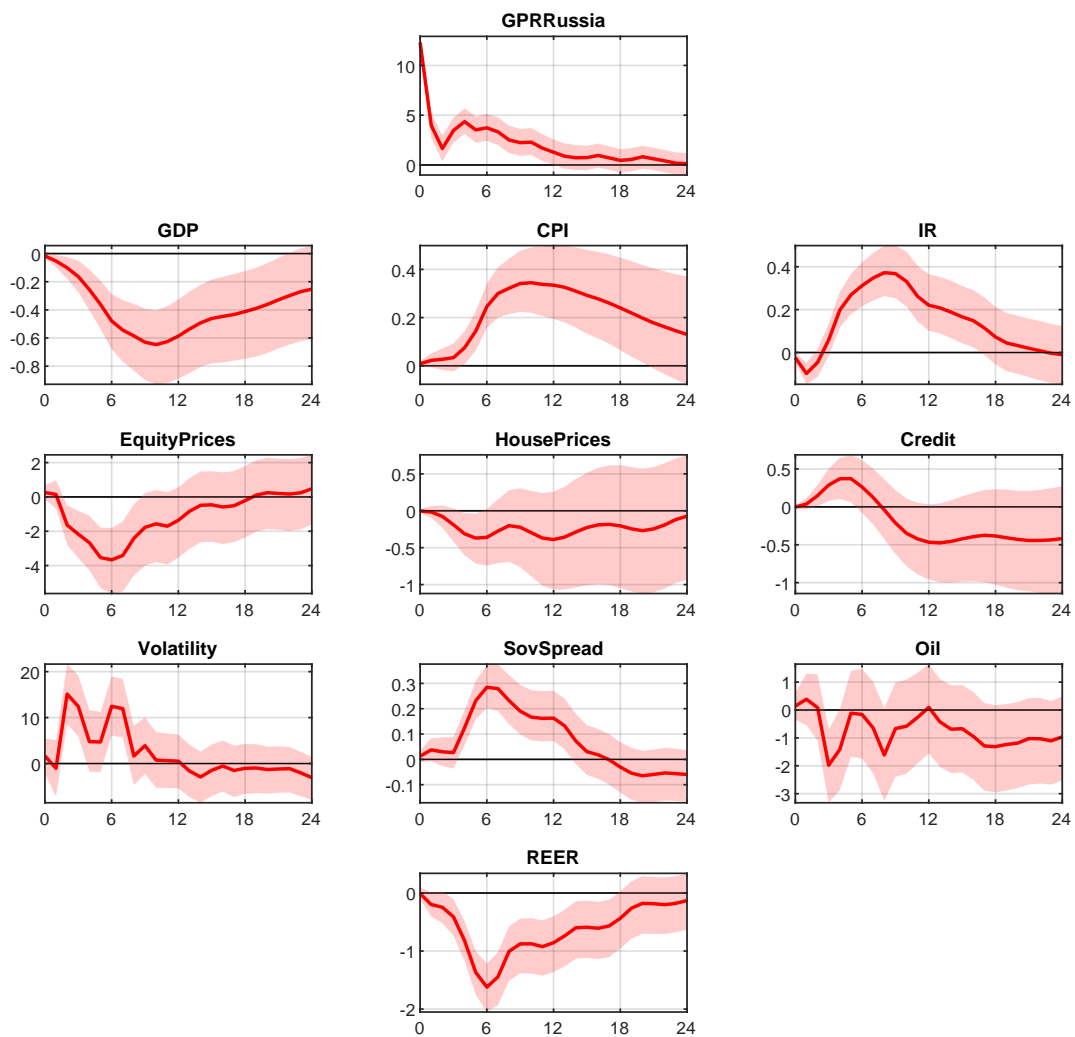

Figure 5: Impact of Russian GPR shock on Russian economy

Notes: Figure shows the impulse responses of the Russian economy to a positive GPR shock up to two years after a shock. For further details on the variables and their abbreviations, please see Section 4.1. Colored areas reflect the 68% highest density regions.

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Shock to Russian GPR index. Figure 5 depicts the impulse responses to a GPR shock, which is identified with the Russian GPR index. On impact, the Russian GPR index rises by about 12% and remains significantly above zero for one year after the shock.

In response to such a local shock, the Russian economy suffers severely. Interestingly, the Russian GPR shock resembles a negative supply shock. Output drops strongly, reaching a minimum of 0.65% below baseline ten months after the shock. In tandem, prices rise by a maximum of around 0.35%, where the peak is also reached ten months after the shock. In response to this, the central bank strongly raises its policy rate by almost 0.4 percentage points, steering against the rise in prices, but likely adding to the reduction in output.

There is also a loss in wealth. Equity prices strongly drop by a maximum of 3.7%. House prices fall briefly by about 0.4%, even though credit is expanding marginally right after the shock. All these results are in line with a persistent increase in volatility (or uncertainty) by up to 15%.

From an international perspective, the results indicate that the real effective exchange rate falls (by up to -1.6%), likely adding to the domestic price pressure, due to an increase in the relative price of imported goods. Furthermore, the financing of government debt becomes more expensive, as the sovereign spread rises by up to 0.3 percentage points. The oil price also briefly declines. Since revenues from the sale of oil are an important source of government income, this puts further strains on the government budget.

Shock to Russian versus Anglosphere GPR index. We replace the Russian GPR index with the Anglosphere GPR index and re-estimate the BSVAR. Figure 6 then compares the responses of an Anglosphere GPR shock (blue) and the Russian GPR shock (red). Remarkably, the Anglosphere GPR shock has no or only a weak direct impact on the Russian economy. Output does not change in response to a shock, nor do prices or the policy rate. For the remaining variables, the responses go in similar directions, however, the impact is much smaller. Only oil prices appear to be hit somewhat more strongly. For the Russian case, our results suggest that it is Russian GPR shocks that matter, especially for the real economy. This underlines the importance of relying on the local perception when identifying shocks to geopolitical risk and assessing their consequences.

We also consider the GPR indices from the Ukrainian and German perception. The conclusions are similar to the analysis of the Anglosphere GPR index. Additionally, we find that the impact tends to become stronger the closer the country is located to Russia. For more details on the impulse responses, please see Appendix F. We also discuss the relative importance of shocks to those country indices in Section 4.4.

Media bias and the transmission of GPR shocks. Next, we compare the effects of a Russian GPR shock when using the indicator based on state-controlled media (red, see
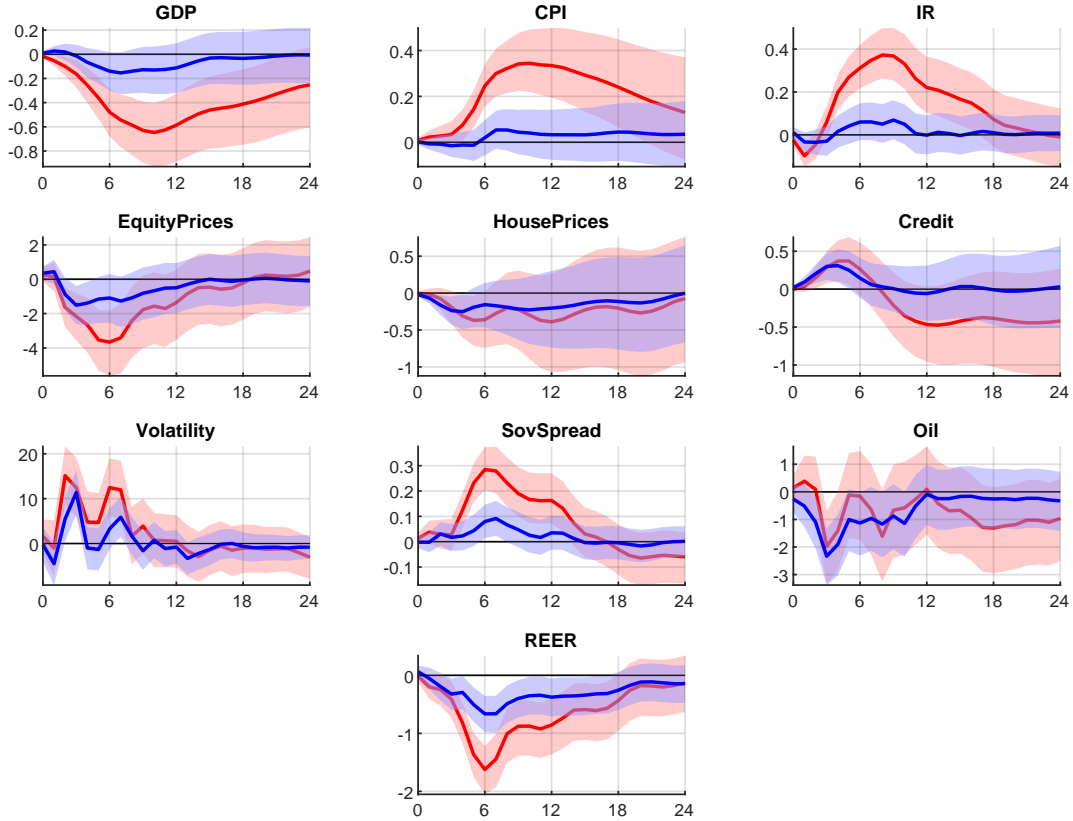
Figure 6: Impact of Russian GPR shock (red) and Anglosphere GPR shock (blue) on Russian economy

Notes: Figure shows the impulse responses of the Russian economy to two positive GPR shocks up to two years after a shock. For further details on the variables and their abbreviations, please see Section 4.1. Colored areas reflect the 68% highest density regions.

Figure 7) versus the independent media one (blue).

The impact of a shock identified using state-controlled media resembles the impact of our benchmark Russian GPR index. In our basket of sources, most media are state-controlled. This was also highlighted by the high correlation between the two indices discussed in Section 3. Still, the impact is slightly stronger for state-controlled media than for our benchmark index. For instance, output declines by up to 0.78%, and by 0.65% when using our benchmark Russian GPR index for shock identification.

A GPR shock identified with independent media appears to have weaker effects on the Russian economy, but its effects last longer. For instance, output still remains subdued two years after a shock. Also the price level is still elevated two years after a shock. Interestingly, equity prices are affected more strongly relative to a GPR shock with state-controlled media.

What could rationalize these findings? One hypothesis is that state-controlled media reports only on those geopolitical risk developments that are important for the state's own narrative. In this way it may emphasize events that are decisive for its own decisions (for instance, also related to geopolitical risk) *now and in the future.* Clearly, this would be in line with the important adverse economic consequences of a state-controlled GPR
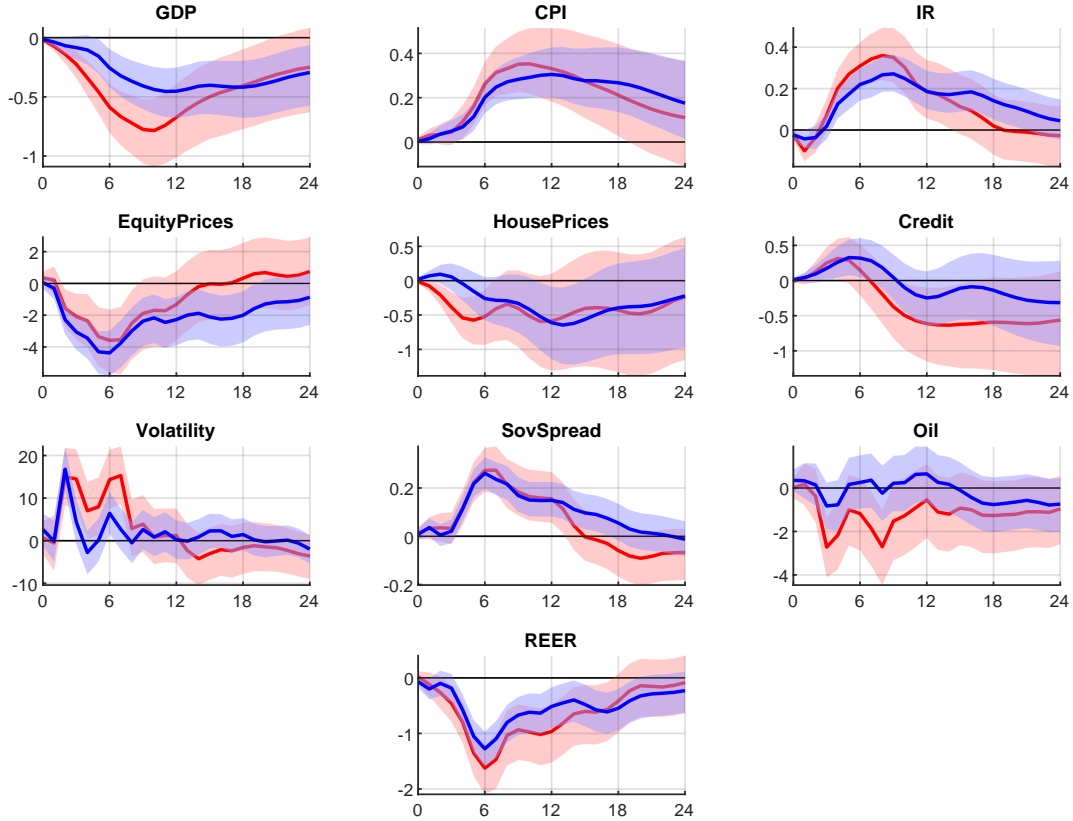
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Figure 7: Impact of Russian state-controlled (red) and Russian independent (blue) media GPR shock on Russian economy

Notes: Figure shows the impulse responses of the Russian economy to two positive GPR shocks up to two years after a shock. For further details on the variables and their abbreviations, please see Section 4.1. Colored areas reflect the 68% highest density regions.

shock. This hypothesis would also be in line with the somewhat less severe independent news-based GPR shock. A sudden rise in this index might not reflect only acts and threats relevant for the state's narratives and decisions, but also other developments (for instance, relevant for the anti-government movement), that may, therefore, not materialize in similar adverse economic effects. Furthermore, such thematically broader reporting may also explain the stronger impact of an independent news-based GPR shock on the forward-looking equity prices, that clearly take various scenarios into account.

An alternative explanation may simply be that state-controlled media have a further reach than independent media. However, this would not explain the larger impact of an independent news-based GPR shock on equity prices.

4.4 Importance of geopolitical risk shocks for aggregate fluctuations

The previous discussion highlighted the differences in transmission that emerge when identifying GPR shocks using different indicators. To fully understand the importance of the different GPR shocks, we perform a forecast error variance decomposition in this sec-

tion; see Table 4. This decomposition indicates the relative importance of GPR shocks in explaining the fluctuations of the variables in the system.

Table 4: Importance of GPR shocks for economic fluctuations in Russia

GPR index :	Russia	-State	-Indep.	Anglos.	Ukraine	Germany
GDP	12	17	6	1	3	1
CPI	10	11	9	0	4	3
IR	17	16	11	1	15	2
EquityPrices	6	5	11	1	3	2
HousePrices	1	3	1	1	0	4
Credit	2	3	1	1	0	3
Volatility	10	12	6	3	2	3
SovSpread	14	13	14	1	12	5
Oil	2	5	0	3	3	1
REER	18	18	12	4	10	5

Notes: Forecast error variance decomposition over first two years after shock, in %. "Russia" refers to the Russian GPR index, "-State" to the Russian GPR index using state-controlled media, "-Indep." to the Russian GPR index using independent media, and "Anglos." to the Anglosphere GPR. For further details on the variables and their abbreviations, please see Section 4.1.

The exercise suggests that Russian GPR shocks matter most for the Russian economy, relative to the other GPR shocks. For instance, a Russian GPR shock explains 12% of fluctuations in output over the first two years after the shock, while an Anglosphere GPR shock explains only 1%. More generally, the importance of Anglosphere GPR shocks does not exceed 4% (see REER).

We find a similar pattern when identifying GPR shocks using GPR indices based on news sources from other countries, such as Ukraine or Germany. Using the German GPR index, the importance of a GPR shock does not exceed 5% (see SovSpread and REER). Only for Ukraine, which is much more affected by geopolitical events that matter from a Russian viewpoint, the importance reaches higher levels. For the policy rate, the sovereign spread, and the real effective exchange rate, the importance reaches levels similar to those of the Russian GPR shocks (up to 15%). But for other variables such as output and prices, the importance of GPR shocks is subdued.

Taken together, accounting for geopolitical risk perceptions is critical to obtain an accurate picture of its impact on the Russian economy.

The table also supports the finding that state-controlled media GPR shocks have a stronger impact than do shocks to our broad Russia GPR index, or to our independent media GPR index. For instance, the importance for output is 17%, as oppsed to 12% for the broad index and 6% for the independent media index. Just for equity prices, the independent media GPR shock is more important, reaching 11% while the others remain around 6% (broad) and 5% (state-controlled media).

Finally, in Appendix H, we extend this analysis by considering a common component of the Russian, Anglosphere, Ukrainian, and German GPR indices and analyzing its relevance for the Russian economy. The analysis suggests, similar to the results above, that the Russian perception of GPR is the most relevant one for the Russian economy.

5 Geopolitical risk and sanctions

We now turn to the role of sanctions in the transmission of geopolitical risk. Sanctions are used by countries ("senders") to restrict or prohibit specific economic activities with another country ("target"). Sanctions are often imposed in response to geopolitical threats or acts. Evidence suggests that sanctions have significant adverse effects on the targeted country's economy. Hence, sanctions are likely to affect the transmission of geopolitical risk shocks. We refer to this effect as the "sanctions channel" of geopolitical risk.

The aim of this section is to evaluate and quantify the sanctions channel. An analysis of the sanctions channel is particularly interesting for our case study of Russia since that country has been subject to an increasing number of economic and financial sanctions in response to its geopolitical actions.

Empirical research suggests that sanctions are rarely successful in meeting their *political* aims; however, they often do inflict significant *economic* damage on the target country (Morgan et al., 2023).[13] When estimating the effect of sanctions, one faces an endogeneity problem, e.g. when geopolitical threats or acts that lead to the sanctioning of target countries likely influence the economic effects of sanctions. Using the sender's aggressiveness as an instrument, Kwon et al. (2022) find that, on average, an additional sanction reduces the sanctioned country's real output per capita by 0.39 percent. Mamonov and Pestova (2023) estimate a "sanctions news shock" using a high-frequency identification approach; they attribute over half of the decline in Russia industrial production in 2014-15 to sanctions.

Simola (2023) reviews the empirical literature on the effects of the 2014 and 2022 sanctions on Russia. Factors limiting the impact of sanctions on Russia are its large economy, its autocratic political regime and opportunities for export to a number of emerging market countries that have not joined the sanctioning coalition. In spite of these factors, Simola (2023) concludes that there is evidence of a significant decline in Russian GDP, imports and foreign direct investment.

The nascent theoretical literature on sanctions has studied the optimal design of trade sanctions (Becko, 2024) and of financial sanctions (Bianchi and Sosa-Padilla, 2023, 2024), or has analyzed the macroeconomic effects of exogenously imposed sanctions in a two-country model (Ghironi et al., 2024). However, none of those papers has focused on the

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[13] Table 5 shows that most sanctions imposed on Russia were political in nature. After Russia's annexation of Crimea in 2014, sanctions imposed by several countries had the objective of averting war in Ukraine. The Russian invasion in 2022 marked the failure of the sanctions to meet that objective.

effects of sanctions enacted in response to geopolitical events, considering the combined effect of heightened geopolitical risk and sanctions on macroeconomic outcomes.

In the following, we first construct a text-based sanctions intensity indicator using Russian-language newspapers. Second, we include this sanctions intensity indicator in an extension of our vector autoregression model. Third, we run a counterfactual analysis to investigate how geopolitical risk would propagate in the absence of sanctions.

5.1 Constructing a sanctions intensity indicator for Russia

We start by documenting the rise of sanctions against Russia. Table 5 below lists the sanctions imposed on Russia during our sample period; they are extracted from the global sanctions database (Syropoulos et al., 2024).[14] The table shows two major waves of sanctions against Russia that were still ongoing at the time of writing: one starting in 2014 after the Russian annexation of Crimea, and the other starting in 2022 after the full-scale attack on Ukraine. The senders are a large coalition of developed countries. Sanction types include financial sanctions, trade sanctions, travel restrictions and other kinds of sanctions. In most cases, the stated objective is either "policy change", "prevent war" or "end war".

In terms of the number of sanction cases imposed on a particular country, Russia occupies a leading position, ahead of Iran, Syria and North Korea; see Figure 8.[15]

To evaluate the sanctions channel of geopolitical risk, we construct a novel monthly sanctions intensity index for Russia using newspaper coverage of sanctions in Russian media sources. Our sanctions intensity index measures the share of articles containing one or more words associated with sanctions against Russia during a month relative to the universe of articles from the selected set of newspapers. Our approach builds on Laudati and Pesaran (2023), who construct a news-based sanctions intensity index for Iran. They use a search query to count the articles that are related to sanctions using Anglosphere newspaper sources, similar to Caldara and Iacoviello (2022).

We deviate from Laudati and Pesaran (2023) by taking local news sources when constructing the sanctions intensity index for Russia. First, we adapt and translate the search query to Russian. Then, we use our universe of Russian news sources, as specified in Table 1, to construct our sanctions intensity index.[16] Furthermore, differently from the original paper, we do not account for the possibility that sanctions were lifted. With the exception of the sanctions imposed by Georgia between 2008 and 2011, sanctions against Russia have not been suspended or canceled over our sample period; see Table 5.

In addition to accounting for the Russian perspective, our approach abstracts from the

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[14] Previous versions of the database are documented in Felbermayr et al. (2020) and Kirilakha et al. (2021).

[15] A sanction case refers to a package of sanctions enacted at one point in time by one country on another country.

[16] Appendix I provides the search query in Russian and its translation into English.

Table 5: Sanctions imposed on Russia since the year 2000

Sender	Begin	End	Objective	Type
Georgia	2008	2011	End war	Other types of sanctions
Australia	2014	2022	Policy change	Arms sanctions / Military assistance / Financial sanctions / Travel restrictions / Trade sanctions
Canada	2014	2022	Policy change	Financial sanctions / Trade sanctions
EU	2014	2022	Policy change	Arms sanctions / Military assistance / Financial sanctions / Trade sanctions
EU, Montenegro, Iceland, Albania, Liechtenstein, Norway, Ukraine	2014	2022	Policy change	Financial sanctions / Travel restrictions / Trade sanctions
Japan	2014	2022	Policy change	Military assistance / Financial sanctions / Travel restrictions / Trade sanctions
New Zealand	2014	2022	Policy change	Financial sanctions / Travel restrictions / Other types of sanctions
Switzerland	2014	2022	Policy change	Arms sanctions / Military assistance / Financial sanctions / Trade sanctions
United States	2014	2022	Policy change / Prevent war	Financial sanctions / Travel restrictions / Trade sanctions
United States	2017	2022	Policy change	Financial sanctions / Trade sanctions
United States	2019	2022	End war / Human rights	Financial sanctions / Travel restrictions
United States	2020	2022	Human rights	Financial sanctions / Trade sanctions
United Kingdom	2021	2022	Policy change	Arms sanctions / Military assistance / Financial sanctions / Travel restrictions / Trade sanctions
Australia	2022	2022	Policy change / Prevent war / End war / Democracy	Financial sanctions / Travel restrictions / Other types of sanctions / Trade sanctions
Canada	2022	2022	End war	Financial sanctions / Travel restrictions / Other types of sanctions / Trade sanctions
EU, Macedonia, Albania, Kosovo	2022	2022	Policy change / Prevent war / End war	Financial sanctions / Travel restrictions / Other types of sanctions / Trade sanctions
G7, EU	2022	2022	End war	Financial sanctions / Trade sanctions
Germany	2022	2022	Policy change / Prevent war	Other types of sanctions / Trade sanctions
Iceland	2022	2022	End war	Financial sanctions / Travel restrictions / Other types of sanctions / Trade sanctions
Japan	2022	2022	Policy change / Prevent war / End war	Financial sanctions / Travel restrictions / Trade sanctions
Korea, South	2022	2022	End war	Financial sanctions / Trade sanctions
Liechtenstein	2022	2022	End war	Financial sanctions
Norway	2022	2022	End war	Financial sanctions / Travel restrictions / Other types of sanctions / Trade sanctions
Singapore	2022	2022	End war	Financial sanctions / Trade sanctions
Switzerland	2022	2022	End war	Financial sanctions / Travel restrictions / Other types of sanctions / Trade sanctions
Taiwan	2022	2022	End war	Trade sanctions
United Kingdom	2022	2022	Policy change / Prevent war / End war / Democracy	Financial sanctions / Travel restrictions / Other types of sanctions / Trade sanctions
United States	2022	2022	Policy change / Prevent war / End war	Financial sanctions / Travel restrictions / Other types of sanctions / Trade sanctions
United States, EU, United Kingdom, Canada, France, Germany, Italy, Japan	2022	2022	End war	Financial sanctions / Other types of sanctions
United States, United Kingdom, Canada	2022	2022	End war	Financial sanctions

Notes: Source: Global sanctions data base, see Syropoulos et al. (2024).

costs of the sender country. If we were to use Anglosphere media sources, the number of articles and thus our index could be influenced by the costs for the sender country, because sanctions can have adverse effects on both the target and the sender country (see, e.g. Besedeš et al., 2021).

Before discussing the dynamics of the index, we want to stress three major advantages of using our new newspaper-based approach relative to an event-based approach for the context of our analysis. First, the sanctions intensity index has a time series dimension at a sufficiently high frequency, which allows us to include it directly in our empirical
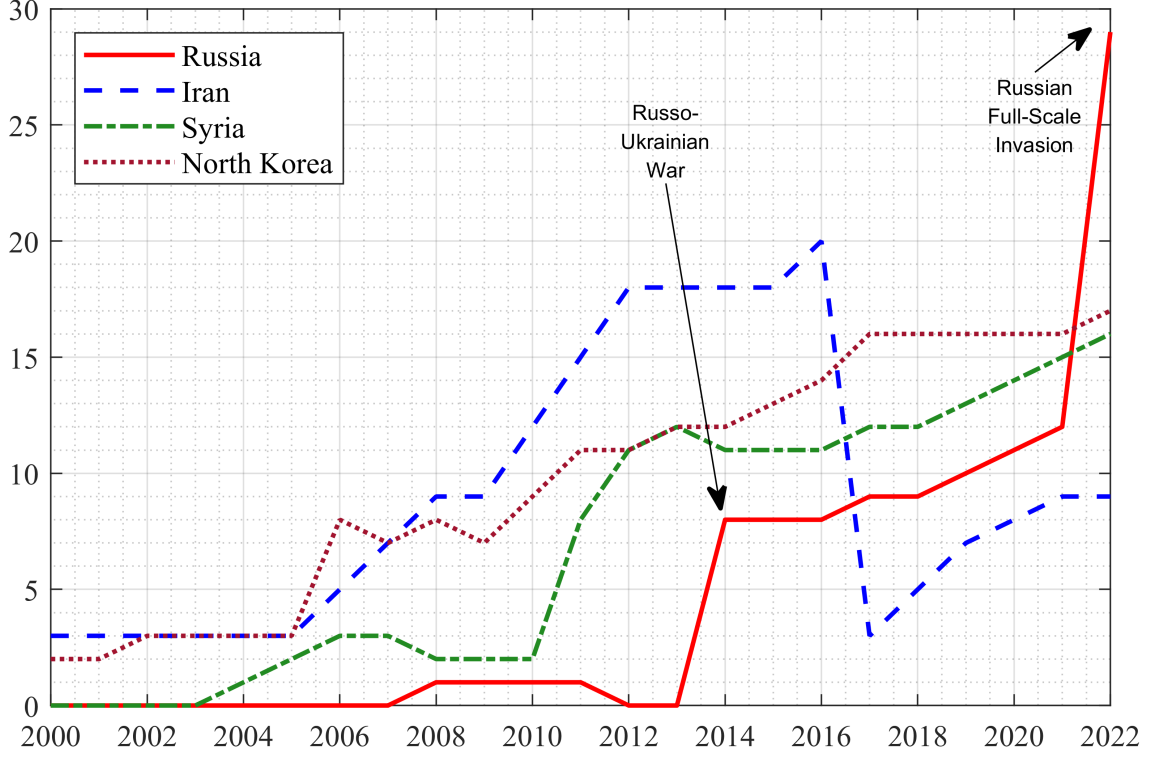
Figure 8: Number of sanction cases for selected target countries since the year 2000

analysis. As a consequence, we can evaluate the sanctions channel of geopolitical risk, as we show later in the section. Second, sanctions have a direct effect, but also an indirect effect that is related to the costs of mitigating and circumventing the sanctions. As emphasized by Laudati and Pesaran (2023), these indirect costs increase with the time during which sanctions are in place. Thus, the index proxies the time-varying intensity of sanctions. Finally, the sanctions intensity index also captures the threat of potential future sanctions, not just those that have been implemented. For instance, firms may adjust their investment decisions based on the possibility of future sanctions.

Our novel sanctions intensity index for Russia is shown in Figure 9 as a dashed blue line. For better interpretation, the figure also depicts our geopolitical risk indicator for Russia. To begin with, the sanctions intensity index was mostly very low until 2014, with Georgia being the only sanctioning country between 2008 and 2011. There were some small spikes around geopolitical events, such as the Russo-Georgian War. Even though no sanctions were imposed on Russia by Western countries during this time period, potential sanctions against Russia were discussed in the media, and thus affected the information conditions of firms, households, and the government. In response to the beginning of the Russo-Ukrainian War, the annexation of Crimea, and the proclamation of the Donetsk People's Republic and Luhansk People's Republic, Western countries imposed sanctions on Russia. Our index captures these events with a large spike and a level shift. Although

Figure 9: Geopolitical risk indicator (left axis) and sanctions intensity indicator (right axis), based on Russian newspapers

the level of the sanctions intensity index slowly fell over time in the following years, our indicator remained at an elevated level. The second large spike can be observed in response to the beginning of the attempted full-scale invasion in Ukraine. Although the spike was initially much larger than in 2014, the sanctions intensity index is now close to the value around 2015. In contrast to this, the geopolitical risk indicator remains very elevated at the end of 2022. More generally, an inspection of the two indices highlights that geopolitical actions coincided with increased sanctions intensity.

As a next step, we analyze qualitatively and quantitatively the sanctions channel of geopolitical risk in Russia.

5.2 Geopolitical risk shocks and the sanctions channel: a counterfactual experiment

In this section, we go back to our dynamic analysis to learn about the role of sanctions for the transmission of geopolitical risk shocks. For this reason, we include the sanctions intensity variable in our Bayesian VAR model.

We order the sanctions intensity index in the second position, directly behind the geopolitical risk measure. This ordering captures the assumption that sanctions respond contemporaneously to geopolitical risk shocks. Thus, it allows for the possibility that

sender countries may impose sanctions in response to geopolitical threats or acts. This assumption is in line with the observations of the Russo-Ukrainian War, during which Western countries imposed sanctions in response to aggressive geopolitical moves by Russia. As shown in Table 5, this happened in two major waves, in 2014 and in 2022.

Figure 10 displays the impulse responses for the model with the sanctions intensity indicator (shown in red). A shock to geopolitical risk significantly increases the sanctions intensity index by approximately 10%. As for the remaining variables, the effects of the geopolitical risk shock are qualitatively and quantitatively similar to our baseline estimation without the sanctions intensity indicator (see Figure 5). Regardless of the inclusion of the sanctions intensity index, a shock to geopolitical risk leads to a significant contraction of GDP, while inflation and interest rates increase. Therefore, the key takeaways are that geopolitical risk increases sanctions intensity and that these results remain robust when accounting for sanctions intensity.

However, to assess the importance of the sanctions channel, we need to take the analysis a step further and conduct a counterfactual exercise. More specifically, we isolate the effect of the sanctions channel of geopolitical risk by shutting it down. In order to accomplish this, we use our estimated VAR model that features the sanctions intensity index as a variable. The dynamic interdependencies are summarized by the estimated coefficient matrices $\hat{A}_i$, where $i = 0, 1, \ldots, 12$ (see also Equation 1).[17] We manipulate the estimated coefficients ex-post, shutting down any impact of the geopolitical risk shock on the sanctions intensity index, i.e. also through a third variable. This implies that the response of the sanctions intensity index to a geopolitical shock is set to zero. To achieve this, we eliminate the contemporaneous impact of geopolitical risk on sanctions by manipulating $\hat{A}_0$. Furthermore, we also do not allow any variable to affect the sanctions index by altering the estimated matrices $\hat{A}_i$, $\forall i = 1, \ldots, 12$. Formally, we adjust the estimated matrices ex-post as follows:

$$\hat{A}_0(1,2) = 0, \text{ and } \hat{A}_i(:,2) = \mathbf{0}_{n \times 1}, \forall i = 1, \ldots, 12, \tag{2}$$

where the brackets indicate the elements that are selected.

In summary, we include the sanctions channel in our estimation and then shut it down ex-post to isolate its effect. This strategy provides a good empirical indication of the relevance of the sanctions channel, even though we acknowledge that it is subject to the Lucas critique.

The counterfactual path in the absence of the sanctions channel is shown in blue in Figure 10. As can be seen in the figure, the response of the sanctions intensity index is now artificially set to zero. Interestingly, the GPR index remains higher with the sanctions channel than without. This could point to a mechanism where geopolitical risk

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[17] Note that we impose an upper triangular structure for A_0 for the structural shock identification throughout the paper and also estimate a vector of constants C.
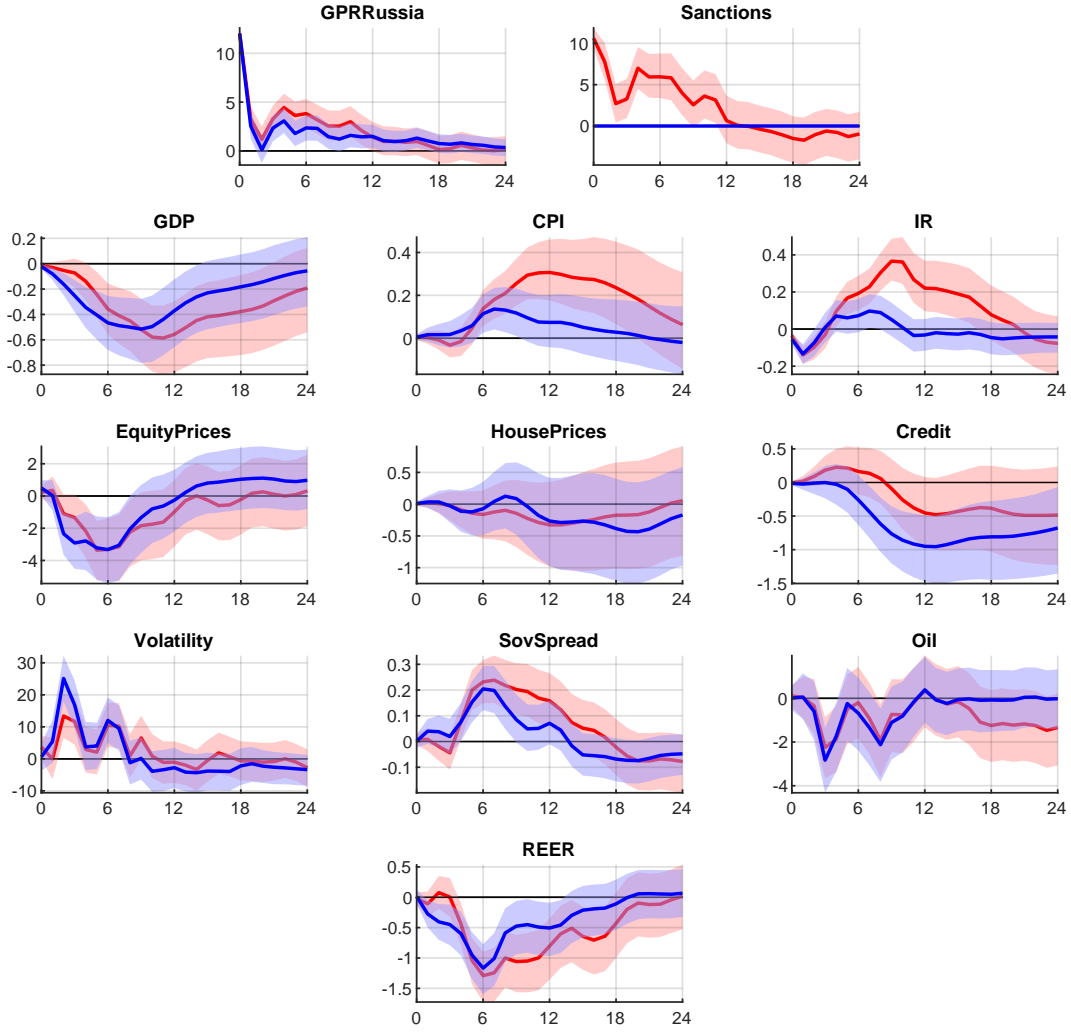
Figure 10: Impact of Russian GPR shock with sanctions channel: Active (red) vs. non-active (blue)

Notes: Figure shows the impulse responses of the Russian economy to two positive GPR shocks up to two years after a shock. For further details on the variables and their abbreviations, please see Section 4.1. Colored areas reflect the 68% highest density regions.

brings about sanctions, which in turn prolong geopolitical risk for Russia. Put differently, without sanctions, geopolitical risk as perceived by the target country would diminish more quickly.

Furthermore, we observe that a geopolitical risk shock still contracts the economy even in the absence of the sanctions channel, although its peak is somewhat lower and the contraction is less prolonged. This is in contrast to other variables, for which the impact of a GPR shock declines when shutting down the sanctions channel. Most importantly, the impact on the price level is weaker without the sanctions channel. In line with this observation, policy interest rates barely move. Also from an international perspective the sanctions channel appears to be important. For instance, the impact of a GPR shock on the sovereign spread and the real effective exchange rate are strongly dampened without the sanctions channel. Our findings are consistent with Laudati and Pesaran (2023), who

report that sanctions affect the Iranian economy through currency depreciations and high inflation.

Overall, the results suggest that the sanctions channel is important for the transmission of geopolitical risk shocks in Russia. Its main effect is to exacerbate the inflationary consequences of a GPR shock, necessitating a strong monetary policy tightening by the Russian central bank. At the same time, our findings highlight that geopolitical risk shocks are important beyond the sanctions channel, as, for instance, the fall in GDP is substantial even in the absence of sanctions.

6 Conclusion

Geopolitical risk (GPR) shocks have dire economic consequences: they lower output, investment, stock prices, and raise inflation. In this paper, we highlight that news reporting about geopolitical events can differ markedly across countries and types of news media. We build on the seminal work by Caldara and Iacoviello (2022) and construct news-based measures of geopolitical risk using country-specific sources. Studying the transmission of GPR shocks to the Russian economy, our findings are threefold. First, we show that an unexpected rise in the Russian GPR measure has strong adverse effects on the Russian economy, while an unexpected rise in other GPR measures does not. Second, we find that Russian GPR measures vary across state-controlled and independent media. Finally, we develop a sanctions intensity index for Russia and point out that the recessionary effects of GPR shocks operate beyond the sanctions channels. We also find that sanctions imposed on Russia in response to geopolitical events amplify the inflation response to GPR shocks.

References

Aguilar, P., C. Ghirelli, M. Pacce, and A. Urtasun (2021). Can news help measure economic sentiment? An application in COVID-19 times. *Economics Letters 199*, 109730.

Ahn, D. P. and R. D. Ludema (2020). The sword and the shield: The economics of targeted sanctions. *European Economic Review 130*, 103587.

Andres-Escayola, E., C. Ghirelli, L. Molina, J. J. Perez, and E. V. Muñoz (2022). Using newspapers for textual indicators: Which and how many? Working Paper 2235, Banco de España.

Antezza, A., A. Frank, P. Frank, L. Franz, I. Kharitonov, B. Kumar, E. Rebinskaya, and C. Trebesch (2022). The Ukraine support tracker: Which countries help Ukraine and how? Working Paper, Kiel Institute for the World Economy.

Antolín-Díaz, J. and J. Rubio-Ramírez (2018). Narrative sign restrictions for SVARS. *American Economic Review 108*, 2802–2829.

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

Barro, R. J. (2006). Rare disasters and asset markets in the twentieth century. *The Quarterly Journal of Economics 121*, 823–866.

Basu, S. and B. Bundick (2017). Uncertainty shocks in a model of effective demand. *Econometrica 85*, 937–958.

Becko, J. S. (2024). A theory of economic sanctions as terms-of-trade manipulation. *Journal of International Economics 150*, 103898.

Besedeš, T., S. Goldbach, and V. Nitsch (2021). Cheap talk? Financial sanctions and non-financial firms. *European Economic Review 134*, 103688.

Bianchi, J. and C. Sosa-Padilla (2023). The macroeconomic consequences of international financial sanctions. *AEA Papers and Proceedings 113*, 29–32.

Bianchi, J. and C. Sosa-Padilla (2024). On wars, sanctions, and sovereign default. *Journal of Monetary Economics 141*, 62–70.

Bloom, N. (2009). The impact of uncertainty shocks. *Econometrica 77*, 623–685.

Caldara, D., S. Conlisk, M. Iacoviello, and M. Penn (2023). Do geopolitical risks raise or lower inflation? Mimeo.

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

Crozet, M. and J. Hinz (2020). Friendly fire: The trade impact of the Russia sanctions and counter-sanctions. *Economic Policy 35*, 97–146.

Drechsel, T. (2024). Estimating the effects of political pressure on the Fed: A narrative approach with new data. Working Paper 32461, National Bureau of Economic Research.

Federle, J., A. Meier, G. Müller, and V. Sehn (2022). Proximity to war: The stock market response to the Russian invasion of Ukraine. Discussion Paper 17185, Centre for Economic Policy Research.

Felbermayr, G., A. Kirilakha, C. Syropoulos, E. Yalcin, and Y. V. Yotov (2020). The global sanctions data base. *European Economic Review 129*, 103561.

Ghironi, F., D. Kim, and G. K. Ozhan (2024). International trade and macroeconomic dynamics with sanctions. Working Paper 32188, National Bureau of Economic Research.

Glick, R. and A. M. Taylor (2010). Collateral damage: Trade disruption and the economic impact of war. *The Review of Economics and Statistics 92*, 102–127.

Grebe, M., S. Kandemir, and P. Tillmann (2024). Uncertainty about the war in Ukraine: Measurement and effects on the German economy. *Journal of Economic Behavior and Organization 217*, 493–506.

Huynh, L. D. T., K. Hoang, and S. Ongena (2023). The impact of foreign sanctions on firm performance in Russia. Research Paper 23-115, Swiss Finance Institute.

Kalamara, E., A. Turrell, C. Redl, G. Kapetanios, and S. Kapadia (2022). Making text count: Economic forecasting using newspaper text. *Journal of Applied Econometrics 37*, 896–919.

Kilian, L. and H. Lütkepohl (2017). *Structural vector autoregressive analysis*. Cambridge: Cambridge University Press.

Kirilakha, A., G. Felbermayr, C. Syropoulos, E. Yalcin, and Y. Yotov (2021). The global sanctions data base: An update that includes the years of the Trump presidency. School of Economics Working Paper 2021-10, LeBow College of Business, Drexel University.

Kozeniauskas, N., A. Orlik, and L. Veldkamp (2018). What are uncertainty shocks? *Journal of Monetary Economics 100*, 1–15.

Kwon, O., C. Syropoulos, and Y. V. Yotov (2022). Do sanctions affect growth? Working Paper 9818, CESifo.

Laudati, D. and M. H. Pesaran (2023). Identifying the effects of sanctions on the Iranian economy using newspaper coverage. *Journal of Applied Econometrics 38*, 271–294.

Leduc, S. and Z. Liu (2016). Uncertainty shocks are aggregate demand shocks. *Journal of Monetary Economics 82*, 20–35.

Mamonov, M., S. Ongena, and A. Pestova (2021). Crime and punishment? How Russian banks anticipated and dealt with global financial sanctions. Discussion Paper 16075, Centre for Economic Policy Research.

Mamonov, M. and A. Pestova (2023). The price of war: Macroeconomic and cross-sectional effects of sanctions on Russia. Working Paper 756, Center for Economic Research and Graduate Education - Economics Institute.

Meinerding, C., Y. Schüler, and P. Zhang (2022). Shocks to transition risk. Discussion Paper 04/2023, Deutsche Bundesbank.

Mogliani, M., J.-G. Sahuc, and L. Ferrara (2022). High-frequency macroeconomic risk measures in the wake of the war in Ukraine. VoxEU.org, 22 April.

Morgan, T. C., C. Syropoulos, and Y. V. Yotov (2023). Economic sanctions: Evolution, consequences, and challenges. *Journal of Economic Perspectives 37*, 3–30.

Ohanian, L. E. (1997). The macroeconomic effects of war finance in the United States: World War II and the Korean War. *American Economic Review 87*, 23–40.

Robertson, J. C. and E. W. Tallman (2001). Improving federal-funds rate forecasts in VAR models used for policy analysis. *Journal of Business and Economic Statistics 19*, 324–330.

Shapiro, A. H., M. Sudhof, and D. J. Wilson (2022). Measuring news sentiment. *Journal of Econometrics 228*, 221–243.

Simola, H. (2023). What the literature says about the effects of sanctions on Russia. Policy Brief 8/2023, Bank of Finland Institute for Emerging Economies.

Simonov, A. and J. Rao (2022). Demand for online news under government control: Evidence from Russia. *Journal of Political Economy 130*, 259–309.

Sims, C. A. and T. Zha (1998). Bayesian methods for dynamic multivariate models. *International Economic Review 39*, 949–968.

Sims, C. A. and T. Zha (2006). Were there regime switches in U.S. monetary policy? *American Economic Review 96*, 54–81.

Syropoulos, C., G. Felbermayr, A. Kirilakha, E. Yalcin, and Y. V. Yotov (2024). The global sanctions data base – Release 3: COVID-19, Russia, and multilateral sanctions. *Review of International Economics 32*, 12–48.

Thorsrud, L. A. (2020). Words are the new numbers: A newsy coincident index of the business cycle. *Journal of Business and Economic Statistics 38*, 393–409.

Waggoner, D. F. and T. Zha (2003). A Gibbs sampler for structural vector autoregressions. *Journal of Economic Dynamics and Control 28*, 349–366.

A Search query for measuring geopolitical risk

We adapt the search query proposed by Caldara and Iacoviello (2022) to the requirements of the Factiva database. The first requirement, which is important for building a query in Factiva, is the set maximum number of search query characters. For Factiva this is 2046 characters. The search query in Caldara and Iacoviello (2022) has more characters than are allowed in Factiva. Therefore, our task is to reduce the query to 2046 characters with minimal possible loss of content. We shortened the query using the asterisk symbol (*), which helps to replace any number of characters after it. The changes that we make to the query by using asterisk are listed in Table 6.

It is also necessary to take into account the specificity of the "language" of Factiva search. Since such Boolean operators as AND, OR, NOT have the same form as in

Table 6: Adaptation of search query to Factiva database

Search query in Caldara and Iacoviello (2022)	our adaptation
"nuclear war" OR "nuclear wars"	"nuclear war*"
"nuclear warhead" OR "nuclear warheads"	"nuclear warhead*"
"atomic war" OR "atomic wars"	"atomic war*"
"atomic warheads"	"atomic warhead*"
"nuclear missile" OR "nuclear missiles"	"nuclear missile*"
"nuclear bomb" OR "nuclear bombardment" OR "nuclear bomber" OR "nuclear bombers" OR "nuclear bombing" OR "nuclear bombs"	"nuclear bomb*"
"atomic bomb" OR "atomic bombing" OR "atomic bombings" OR "atomic bombs"	"atomic bomb*"
"hydrogen bomb" OR "hydrogen bombs"	"hydrogen bomb*"
"book" OR "books"	"book*"

Factiva, we do not change them. But NEAR/2 should be recorded according to Factiva requirements as near2. Also, the Factiva query does not need to specify the type of articles to search for, so we remove the following text from the query: DTYPE(article OR commentary OR editorial OR feature OR front page article OR front page/cover story OR news OR report OR review). Besides, it allows us to reduce the size of the search query.

Additionally, we were forced to remove build-up* from the request, because in Factiva it is not possible to use an asterisk after only two letters (up*). The program requires a minimum of three characters through an asterisk. The search query for counting the total number of articles was left unchanged because the language in which it is written does not conflict with the search requirements in Factiva. The search query that we received after adaptation is shown in Appendix A.1.

Translating the search query into different languages, we consider the various synonyms for each word and their likelihood of appearance in the context of geopolitical risk, i.e. taking into account cultural and linguistic features.

Finally, to construct a search query for the total number of articles, we cannot rely on a simple translation of the original search query. This is because of the the specificity of the different languages. Therefore, we consider a list of the most commonly used words in different languages. Of the first 10 words, we chose six that should be present in any article. For the Russian search query, for instance, this means that we remove the personal pronouns я, он and the words быть and что.

A.1 Anglosphere

Search query for geopolitical risk: ((war OR conflict OR hostilities OR revolution* OR insurrection OR uprising OR revolt OR coup OR geopolitical) near2 (risk* OR warn* OR fear* OR danger* OR

threat* OR doubt* OR crisis OR troubl* OR disput* OR concern* OR tension* OR imminen* OR inevitable OR footing OR menace* OR brink OR scare OR peril*)) OR ((peace OR truce OR armistice OR treaty OR parley) near2 (menace* OR reject* OR boycott* OR disrupt* OR threat OR peril)) OR ((military OR troops OR missile* OR "arms" OR weapon* OR bomb* OR warhead*) AND (buildup* OR blockad* OR sanction* OR embargo OR quarantine OR ultimatum OR mobiliz* OR offensive)) OR (("nuclear war*" OR "nuclear warfare" OR "nuclear warhead*") OR ("atomic war*" OR "atomic warfare" OR "atomic warhead*") OR ("nuclear missile*" OR "nuclear bomb*" OR "atomic bomb*" OR "h-bomb*" OR "hydrogen bomb*" OR "nuclear test*") AND (risk* OR warn* OR fear* OR danger* OR threat* OR doubt* OR crisis OR troubl* OR disput* OR concern* OR tension* OR imminen* OR inevitable OR footing OR menace* OR brink OR scare OR peril*)) OR ((terroris* OR guerrilla* OR hostage*) near2 (risk* OR warn* OR fear* OR danger* OR threat* OR doubt* OR crisis OR troubl* OR disput* OR concern* OR tension* OR imminen* OR inevitable OR footing OR menace* OR brink OR scare OR peril)) OR ((war OR conflict OR hostilities OR revolution* OR insurrection OR uprising OR revolt OR coup OR geopolitical) near2 (begin* OR begun OR began OR outbreak OR "broke out" OR breakout OR start* OR declar* OR proclamation OR launch* OR wage*)) OR ((allie* OR enem* OR foe* OR army OR navy OR aerial OR troops OR rebels OR insurgen*) near2 (drive* OR shell* OR advance* OR invasion OR invad* OR clash* OR attack* OR raid* OR launch* OR strike*)) OR ((terroris* OR guerrilla* OR hostage*) near2 (act OR attack OR bomb* OR kill* OR strike* OR hijack*)) NOT (movie* OR film* OR museum* OR anniversar* OR obituar* OR memorial* OR arts OR book* OR memoir* OR "price war" OR game OR story OR history OR veteran* OR tribute* OR sport OR music OR racing OR cancer).

Search query for the counting total number of articles: "the" AND "be" AND "to" AND "of" AND "and" AND "at" AND "in".

A.2 Russia

Search query for geopolitical risk: ((войн* OR воен* OR боев* OR столкновени* OR противостояни* OR конфронтаци* OR конфликт OR революци* OR переворот OR восстани* OR геополитеческ*) near2 (риск OR вероятность OR возможность OR угроза OR предупрежден* OR кризис OR тревог* OR напряжени* OR паника OR опасность)) OR ((мир OR мирн* OR перемири* OR «прекр* военн* действ*» OR «прекращение огня» OR договор OR переговоры OR соглашени*) near2 (угроз* OR опасность OR отклон* OR отказ* OR бойкот OR срыв* OR наруш*)) OR ((воен* OR боев* OR войска OR «вооруженные силы» OR арми* OR ракет* OR оружи* OR снаряд* OR войн* OR танк OR бомб* OR боеголовк*) AND (наращ* OR сосредотач* OR расшир* OR изол* OR санкци* OR эмбарго OR запрет* OR ультиматум OR мобилиз* OR наступ*)) OR ((ядерн* OR атомн* OR «ядерн* оружи*» OR «атомн* оружи*» OR «ядерн* боеголовк*» OR ракет* OR бомб* OR водородн* OR «ядерн* испытани*» OR «испытани* ядерн* орижи*») AND (риск OR вероятность OR возможность OR угроза OR предупрежден* OR кризис OR тревог* OR напряжени* OR паника OR опасность)) OR ((террор* OR заложник) near2 (риск OR.. вероятность OR возможность OR угроза OR предупрежден* OR кризис OR тревог* OR напряжени* OR паника OR опасность)) OR ((войн* OR

«военн* действи*» OR «боевы* действи*» OR столкновени* OR противостояни* OR конфронтаци* OR конфликт OR революци* OR переворот OR восстани* OR геополитеческ*) near2 (начин* OR начал* OR вспых* OR объявл* OR провозгл*)) OR ((союзник* OR враг* OR враж* OR противник* OR арми* OR «вооруженн* сил*» OR «военно-морски* сил*» OR воздушн* OR авиаци* OR войска OR повстан*) near2 (снаряд* OR продвижен* OR наступ* OR вторжени* OR вторг* OR захват* OR столкновени* OR конфликт* OR атак* OR напад*)) OR ((терроризм OR заложник) near2 (действ* OR атак* OR напад* OR бомб* OR убив* OR убийств* OR ликвидир* OR бастов* OR забастовка OR налет* OR «угон самолета»)) NOT (кино OR фильм* OR музей OR годовщина OR юбилей OR некролог OR мемориал OR памятник OR искусство OR книг* OR мемуар* OR биографи* OR игр* OR истори* OR рассказ* OR ветеран* OR дань OR спорт OR музыка).

Search query for counting the total number of articles for Russia: "и" AND "в" AND "не" AND "на" AND "с" AND "а"

A.3 Ukraine

Using a similar methodology, we calculated a GPR index for Ukraine. Since Ukraine has historically developed a wide use of the Russian language in every-day life and in the mass media, we used a Russian-language search query, but with some adjustments (due to the greater prevalence of some synonyms in Ukraine). Next, we translate search request into Ukrainian, taking into account the cultural and linguistic features of Ukraine.

To count the total number of articles, a combined search query was built. The request combined simultaneously a query in Ukrainian and Russian. This is necessary because almost every information source in Ukraine is published in both languages. Since 2014, there has been a significant reduction in Russian-language publications.

Ukrainian search query in Russian language for geopolitical risk: ((войн* OR воен* OR боев* OR столкновени* OR противостояни* OR конфронтаци* OR конфликт OR революци* OR переворот OR восстани* OR геополитеческ* OR ато) near2 (риск OR вероятность OR возможность OR угроза OR предупрежден* OR кризис OR тревог* OR напряжени* OR паника OR опасность)) OR ((мир OR мирн* OR перемири* OR «прекр* военн* действ*» OR «прекращение огня» OR договор OR переговоры OR соглашени*) near2 (угроз* OR опасность OR отклон* OR отказ* OR бойкот OR срыв* OR наруш*)) OR ((воен* OR боев* OR войска OR «вооруженные силы» OR арми* OR ракет* OR оружи* OR снаряд* OR войн* OR танк OR бомб* OR боеголовк*) AND (наращиващ* OR сосредот* OR расшир* OR изол* OR санкци* OR эмбарго OR запрет* OR ультиматум OR мобилиз* OR наступ*)) AND ((ядерн* OR атомн* OR «ядерн* оружи*» OR «атомн* оружи*» OR «ядерн* боеголовк*» OR ракет* OR бомб* OR водородн* OR «ядерн* испытани*» OR «испытани* ядерн* орижи*») AND (риск OR вероятность OR возможность OR угроза OR предупрежден* OR кризис OR тревог* OR напряжени* OR паника OR опасность)) OR ((террор* OR заложник) near2 (риск OR вероятность OR возможность OR угроза OR предупрежден* OR кризис OR тревог* OR напряжени* OR паника OR

опасность)) OR ((войн* OR воен* OR боев* OR столкновени* OR противостояни* OR конфронтаци* OR конфликт OR революци* OR переворот OR восстани* OR геополитеческ* OR ато) near2 (начин* OR начал* OR вспых* OR объяв* OR провозгл*))OR ((союзник* OR враг* OR противник* OR арми* OR «вооруженн* сил*» OR «военно-морски* сил*» OR воздушн* OR авиаци* OR войска OR повстан*) near2 (снаряд* OR продвижен* OR наступ* OR вторжени* OR вторг* OR захват* OR столкновени* OR конфликт* OR атак* OR напад*) OR ((террор* OR заложник) near2 (действ* OR атак* OR напад* OR бомб* OR убив* OR убийств* OR ликвидир* OR бастов* OR забастовка OR налет* OR «угон самолета»)) NOT (кино OR фильм* OR музей OR годовщина OR юбилей OR некролог OR мемориал OR памятник OR искусство OR книг* OR мемуар* OR биографи* OR игр* OR истори* OR рассказ* OR ветеран* OR дань OR спорт OR музыка)).

Ukrainian search query in Ukrainian language for geopolitical risk: ((війн* OR воєн* OR бойов* OR сутичк* OR протистоян* OR конфронтаці* OR конфлікт OR революці* OR переворот OR повстан* OR заворушен* OR геополіт* OR ато) near2 (ризик OR ймовірн* OR імовірн* OR можлив* OR загроз* OR небезпек* OR попередж* OR погро* OR криз* OR загостр* OR тривог* OR напруж*)) OR ((мир* OR перемир* OR мирн* OR «припинен* воєн* дій» OR «припинен* вогн*» OR договір OR угод* OR переговор* OR перемовини OR домовлен*) near2 (загроз* OR небезпек* OR відхил* OR відмов* OR бойкот OR зрив* OR поруш*)) OR ((воєн* OR бойов* OR військ* OR армі* OR «збройн* сил*» OR ракет* OR збро* OR снаряд* OR війн* OR танк* OR бомб* OR боєголовк*) AND (нарощув* OR зосередж* OR розшир* OR ізоляц* OR санці* OR ембарго OR заборон* OR ультиматум OR мобіліз* OR наступ)) AND ((ядерн* OR атомн* OR «ядерн* збро*» OR «атомн* збро*» OR «ядерн* боєголовк*» OR ракет* OR бомб* OR воднев* OR «ядерн* випробув*» OR "випроб* ядерн* збро*") AND (ризик OR ймовірн* OR імовірн* OR можлив* OR загроз* OR небезпек* OR попередж* OR погро* OR криза* OR загостр* OR тривог* OR напруж*)) OR ((терор* OR заручник*) near2 (ризик OR ймовірн* OR імовірн* OR можлив* OR загроз* OR небезпек* OR попередж* OR погро* OR криз* OR загостр* OR тривог* OR напруж*)) OR ((війн* OR воєн* OR бойов* OR сутичк* OR протистоян* OR конфронтаці* OR конфлікт OR революці* OR переворот OR повстан* OR заворушен* OR геополіт* OR ато) near2 (початок OR почал* OR розпочал* OR спалах* OR огол* OR прогол*))OR ((союзник* OR ворог* OR спільник* OR військ* OR «збройн* сил*» OR «військово-морськ* сил*» OR повітр* OR авіаці* OR армі* OR повстан*) near2 (снаряд* OR просув* OR вторгн* OR захопл* OR сутичк* OR протистоян* OR конфлікт* OR атак* OR напад*) OR ((терор* OR заручник*) near2 (дії OR атак* OR напад* OR бомб* OR вбив* OR ліквід* OR бастув* OR забастовка OR «викрадення літака»)) NOT (кіно OR фільм* OR музей OR річниця OR ювілей OR некролог OR меморіал OR пам'ятник OR мистецтво OR книг* OR мемуар* OR біограф* OR гра OR історі* OR розпов* OR ветеран* OR данина OR спорт OR музика)).

Search query for counting the total number of articles: ("и" AND "в" AND "не" AND "на") OR ("ї" AND "в" AND "не" AND "на").

A.4 Germany

Search query in German for geopolitical risk: ((Krieg OR Konflikt OR Kampfhandl* OR Revolution* OR Aufstand OR Revolte OR Staatsstreich OR geopolitisch*) near2 (Risiko OR Warn* OR Sorge* OR Gefahr* OR Bedroh* OR Zweifel* OR Krise OR Unruh* OR Auseinanders* OR Befürchtung* OR Spannung* OR Droh* OR unvermeid* OR erschreck*)) OR ((Friede* OR Waffenruhe OR Waffenstillst* OR Vertrag OR Verhandl*) near2 (droh* OR ablehn* OR boykott* OR unterbr* OR bedroh* OR Gefahr)) OR ((Militär* OR Truppen OR Rakete* OR Waffe* OR Bombe* OR Sprengk*) AND (Aufbau* OR Blockade* OR Sanktion* OR Embargo OR Quarantäne OR Ultimatum OR mobilis* OR Offensive)) OR ((Nuklear* OR "nukleare Krieg*") OR (Atomkrieg* OR "atomarer Krieg*" OR Atomsprengk*) OR (Atomrakete OR Nuklearrakete* OR Nuklearbombe* OR Atombombe* OR H-Bombe* OR Wasserstoffbombe* OR Atomtest*) AND (Risiko OR Warn* OR Sorge* OR Gefahr* OR Bedroh* OR Zweifel* OR Krise OR Unruh* OR Auseinanders* OR Befürchtung* OR Spannung* OR Droh* OR unvermeid* OR erschreck*)) OR ((Terroris* OR Guerilla* OR Geisel*) near2 (Risiko* OR warn* OR Angst* OR Sorge* OR befürcht* OR Gefahr* OR gefährlich* OR bedroh* OR zweifel* OR Krise OR Unruh* OR Auseinandersetzung* OR Disput* OR Streit* OR Bedenken* OR Befürchtung* OR Spannung* OR droh* OR unvermeidlich OR Schreck*)) OR ((Krieg OR Konflikt OR Kampfhandl* OR Revolution* OR Aufstand OR Revolte OR Staatsstreich OR geopolitisch*) near2 (beginn* OR begann OR begonn* OR Ausbruch OR "brach aus" OR start* OR anfang* OR erklär* OR Verkündung)) OR ((verbündet* OR alliiert* OR feind* OR Gegner* OR Armee OR Streitkräfte OR Marine OR Luft* OR Truppen OR Rebellen OR Aufst*) near2 (bombard* OR vorrück* OR Vormarsch OR Einmarsch OR zusammenst* OR angr* OR überf* OR *schlag)) OR ((Terroris* OR Guerilla* OR Geisel*) near2 (Akt OR Tat OR Angriff OR Bombe* OR töt* OR *schlag OR angr* OR entführ*)) NOT (Kinofilm* OR Film* OR Museum* OR Jahrestag* OR Gedenk* OR Kunst OR Buch* OR Denkschrift* OR Biografie* OR Preiskrieg OR Spiel OR Geschichte OR Veteran* OR Ehr* OR sport OR Musik OR Rennen OR Krebs)

Search query for counting the total number of articles: ((der OR dem OR den OR des OR die OR das) AND (sein OR ist) AND (zu OR zum OR zur) AND und AND (in OR im)

B Circulation, release frequency and first edition of Russian media sources

Table 7: Russian state-controlled media sources

Name of newspaper/magazine	Circulation	Release frequency	First edition
Argumenty i Fakty	2200000	Weekly	1978
Argumenty nedeli	570000	Weekly	2006
Izvestia	84850	Daily	1917
Kommersant	78945	Daily	1989
Komsomolskaya Pravda	660000	Daily	1925
Moskovskii Komsomolets	930000	Weekly	1919
Parlamentskaya gazeta	56500	Weekly	1998
Profil	110000	Weekly	1996
Rossiyskaya Gazeta	185445	Daily	1990
Vedomosti	75000	Daily	1999

Notes: The circulation is taken from the newspapers' and magazines' websites.

Table 8: Russian independent media sources

Name of newspaper /magazine	Media type	Release frequency	First edition - closing date
7x7 – Horizontal Russia	Online magazine and media platform	Daily	2010 - 6 March 2022
Echo of Moscow	Radio station and online magazine	Daily	1990 - 3 March 2022
Fontanka.ru	Electronic newspaper	Daily	2000
Grani.ru	Electronic newspaper	Daily	2000
Mediazona	Electronic newspaper	Daily	2014
Meduza	Electronic newspaper	Daily	2014
Novaya Gazeta	Newspaper	3× per week	1993
Republic	Business internet resource	Daily	2009 - 6 March 2022
The Project	Electronic newspaper	Daily	2018
TV Dozhd	Electronic newspaper, broadcast on YouTube	Daily	2008

C Correlation among GPR measures

Table 9: Correlation matrix of country-specific GPR indices

↓ GPR index →	Russia	Anglosphere	Ukraine	Germany	United Kingdom	United States
Russia	1.00	0.58	0.86	0.71	0.54	0.58
Anglosphere	0.58	1.00	0.46	0.87	0.95	0.99
Ukraine	0.86	0.46	1.00	0.65	0.41	0.47
Germany	0.71	0.87	0.65	1.00	0.86	0.86
United Kingdom	0.54	0.95	0.41	0.86	1.00	0.91
United States	0.58	0.99	0.47	0.86	0.91	1.00

Notes: The sample period for the correlation coefficients is July 2002 until December 2022, i.e. including the Russian full scale invasion of Ukraine.

D Comparing country-specific GPR measures

In this section, we compare the country-specific GPR indices by Caldara and Iacoviello (2022, hereafter CI) with the global GPR indices developed in our study, which we derive from country-specific news sources. Our aim is to assess whether the CI indices can effectively serve as proxies for our indices.

To recall, the CI country-specific indices modify the original search phrase of their global GPR measure, requiring that the articles also include the name of the country or its capital (or main city), while utilizing US news sources. Thus, these indices specifically measure geopolitical risk that involves – or at least references – the particular country and maintain an Anglosphere perspective.

Table 10 below shows the correlation matrix between the different GPR indices. We label the replicated Anglosphere GPR index as "Anglosphere", our GPR indices based on country-specific news sources, for instance, as "Russia", and the country-specific GPR indices constructed by CI, for instance, as "Russia CI".

The table illustrates that the correlation between the Anglosphere GPR and the Russian GPR index is relatively modest at 0.517. However, when the Russian CI GPR index, which is based on English-language newspapers, is compared with our Russian GPR index derived from local news sources, the correlation increases to 0.788. While this is an improvement, it is still not high enough to suggest a close proxy. This indicates that narrowing the focus of the Anglosphere GPR index to specifically pick news articles with Russian references enhances its alignment with our GPR index from a Russian perspective, yet the correlation remains far from perfect.

Interestingly, this specific pattern of increased correlation does not hold for all countries. For example, our GPR indices from German and UK perspectives show stronger

Table 10: Correlations between different GPR indices

GPR index	Anglosphere	Russia	Russia CI	Ukraine	Ukraine CI	Germany	Germany CI	UK	UK CI	US	US CI
Anglosphere	1	0.517	0.671	0.493	0.565	0.856	0.772	0.952	0.882	0.994	0.938
Russia	0.517	1	0.788	0.868	0.800	0.680	0.625	0.485	0.270	0.529	0.364
Russia CI	0.671	0.788	1	0.868	0.953	0.821	0.876	0.649	0.504	0.676	0.550
Ukraine	0.493	0.868	0.868	1	0.902	0.688	0.685	0.453	0.248	0.508	0.314
Ukraine CI	0.565	0.800	0.953	0.902	1	0.791	0.795	0.550	0.385	0.573	0.411
Germany	0.856	0.680	0.821	0.688	0.791	1	0.822	0.857	0.749	0.854	0.773
Germany CI	0.772	0.625	0.876	0.685	0.795	0.822	1	0.750	0.684	0.766	0.693
UK	0.952	0.485	0.649	0.453	0.550	0.857	0.750	1	0.893	0.923	0.885
UK CI	0.882	0.270	0.504	0.248	0.385	0.749	0.684	0.893	1	0.864	0.922
US	0.994	0.529	0.676	0.508	0.573	0.854	0.766	0.923	0.864	1	0.936
US CI	0.938	0.364	0.550	0.314	0.411	0.773	0.693	0.885	0.922	0.936	1

Notes: The sample period is July 2002 until the end of March 2024.

correlations with the Anglosphere GPR index than with their respective country-specific CI indices. This highlights that different indices capture unique aspects of geopolitical risk, which are specific to each country's context.

Crucially, the findings confirm that the Russian CI GPR index does not closely proxy our locally sourced Russian GPR index. This emphasizes the relevance of local news sources in accurately reflecting the nuanced features of geopolitical risk perceptions within Russia.

Next, we explore whether a GPR shock identified using the Russian CI index can closely represent the impact of a GPR shock identified using our Russian GPR index on the Russian economy. Figure 11 displays the impulse responses of Russian macroeconomic aggregates to these shocks.

The results indicate that the impacts of these two shocks are not equivalent. Specifically, the effects of a GPR shock identified with our measure are more pronounced and persist over more periods. Notably, the recession triggered by a GPR shock is deeper when identified by our index, accompanied by a substantial surge in inflation that is absent when using the Russian CI GPR indicator. This analysis confirms that the choice of GPR measure – and the specific perspective it represents – substantially determines the impact of geopolitical risk shocks on the Russian economy.

In summary, these findings reinforce that the Russian CI GPR index does not closely proxy our locally sourced Russian GPR index, underscoring the significance of selecting the appropriate geopolitical risk measure. Again, this highlights the value and relevance of our contribution in capturing the nuanced effects of geopolitical risk perceptions.
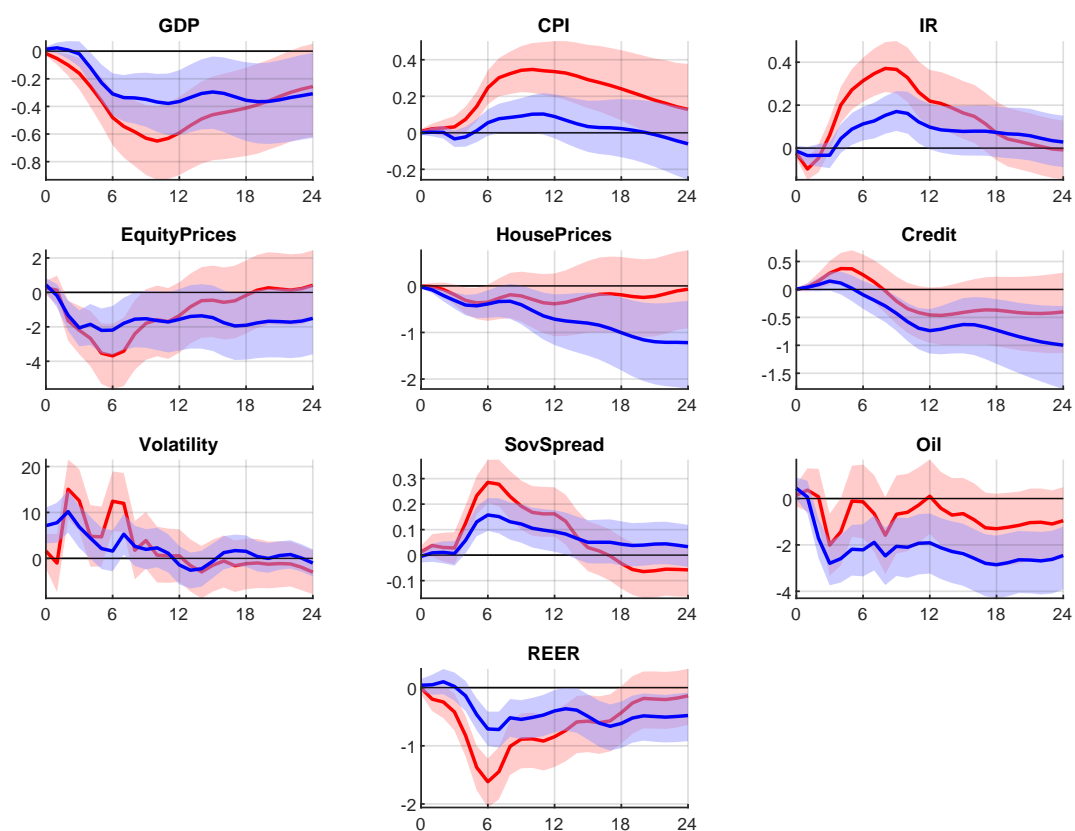
Figure 11: Impact of Russian GPR shock (red) and Russian CI GPR shock (blue) on Russian economy

Notes: Figure shows the impulse responses of the Russian economy to a positive GPR shock up to two years after a shock. Colored areas reflect the 68% highest density regions.

E Data

In this section, we briefly report the identifiers we use to download the Russian data from Haver. The identifiers are reported in brackets. "sa" means we use the seasonal adjustment procedure implemented in Haver and "FX" mean that currencies are converted to Russian rubles. Furthermore, if we report two identifiers, we use the second identifier to backcast the series that can be downloaded with the first identifier.

- Gross domestic product (H922NGPC@EMERGE)

- Consumer price index (S922PC@EMERGE)

- Interest rates (N922RTAV@EMERGECW)

- Equity prices (N922FKAV@EMERGE)

- House prices (sa(N922HG@EMERGE)),

- Total credit volumes (S922CTPV@BIS),

- Russian long-term government bond yield
  (C922FYGL@OECDMEI,N922FKAV@EMERGE)

- Unites States long-term government bond yield (FCM10@USECON)

- Ural oil price (FX(N922POIL@EMERGECW,922))

- Real effective exchange rate (C922EIRC@IFS)

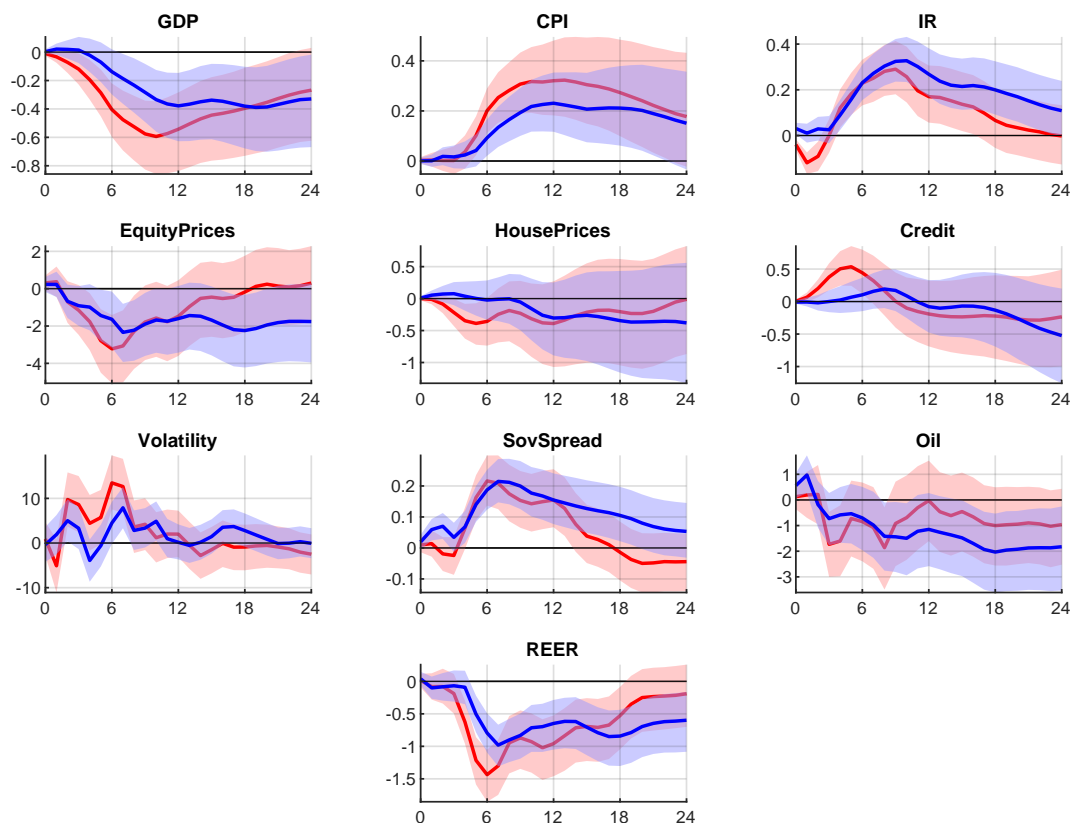# F   BSVAR results for Ukraine and Germany

Figure 12: Impact of Russian (red) and Ukraine (blue) GPR shock on Russian economy

Notes: Figure shows the impulse responses of the Russian economy to two positive GPR shocks up to two years after a shock. For further details on the variables and their abbreviations, please see Section 4.1. Colored areas reflect the 68% highest density regions.
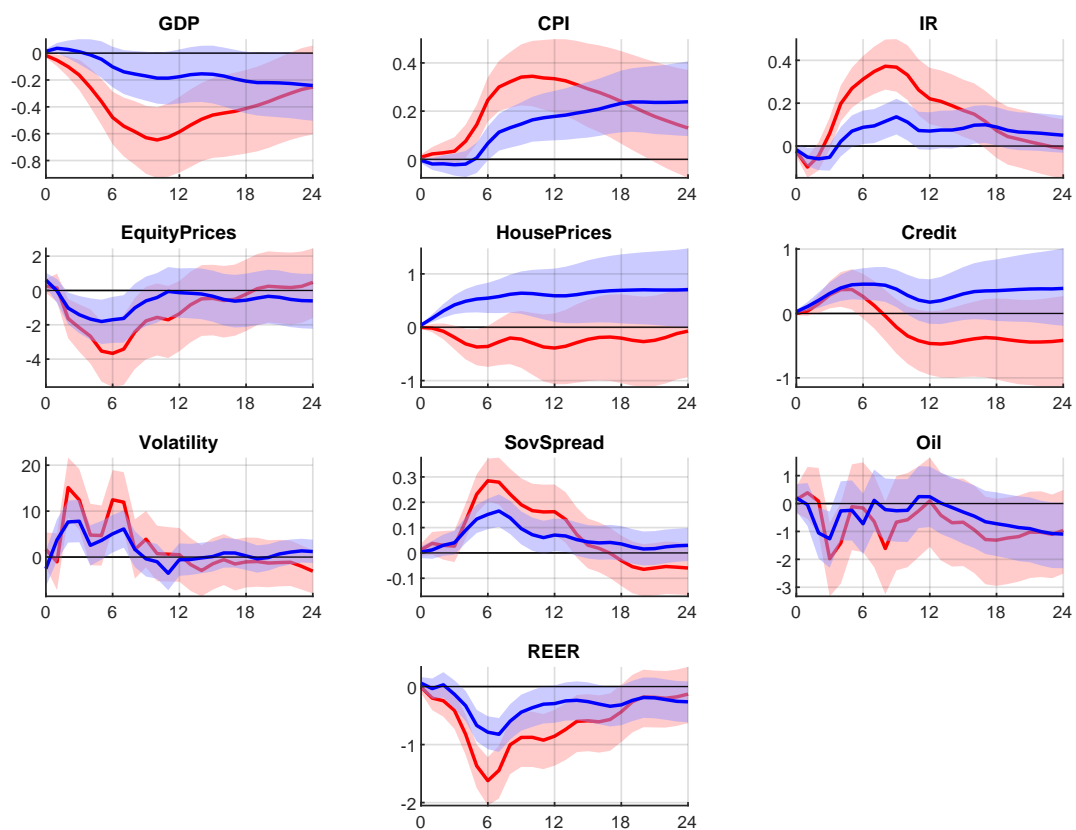
Figure 13: Impact of Russian (red) and German (blue) GPR shock on Russian economy

Notes: Figure shows the impulse responses of the Russian economy to two positive GPR shocks up to two years after a shock. For further details on the variables and their abbreviations, please see Section 4.1. Colored areas reflect the 68% highest density regions.

G Robustness BSVAR results: Narrative sign restrictions

We check for robustness of our empirical analysis by using narrative sign restrictions, following the approach suggested by Antolín-Díaz and Rubio-Ramírez (2018). Narrative sign restrictions are very well suited for geopolitical risk analysis, because key events can be easily identified. In doing so, our paper also nicely follows other recent contributions that use such an identification method in political contexts as well, such as Drechsel (2024). Similar to our benchmark BSVAR model by Waggoner and Zha (2003), the BSVAR proposed by Antolín-Díaz and Rubio-Ramírez (2018) uses a Minnesota prior and allows us to define the GPR index as a stationary variable.

We consider the onsets of the Russo-Georgian War (August 2008) and the Russo-Ukrainian War (March 2014) as narrative events. Both the Russo-Georgian War and the Russo-Ukrainian War represent the most significant geopolitical events from the Russian perspective during the sample period used for the VAR analysis. Particularly, we assume that a GPR shock contemporaneously raises the GPR index on these dates. As a narrative sign restriction, we impose that, at the onset of each war, the GPR shock is positive and is the most significant contributor to the GPR index, relative to the sum of all other shocks. This means that other shocks may also impact the GPR index contemporaneously, but the main driver of the index on that date is the GPR shock.

The impulse responses are shown in Figure 14, and Table 11 presents the forecast error variance decomposition. The red line and area represent the results from the benchmark Cholesky identification scheme, while the blue line and area show results using narrative sign restrictions.

The results are largely robust to this alternative identification scheme, although some differences emerge. For instance, there is a stronger initial reaction of the interest rate, equity prices, and volatility using the narrative sign restrictions. Additionally, the importance of the GPR shock is slightly smaller compared to the benchmark identification.
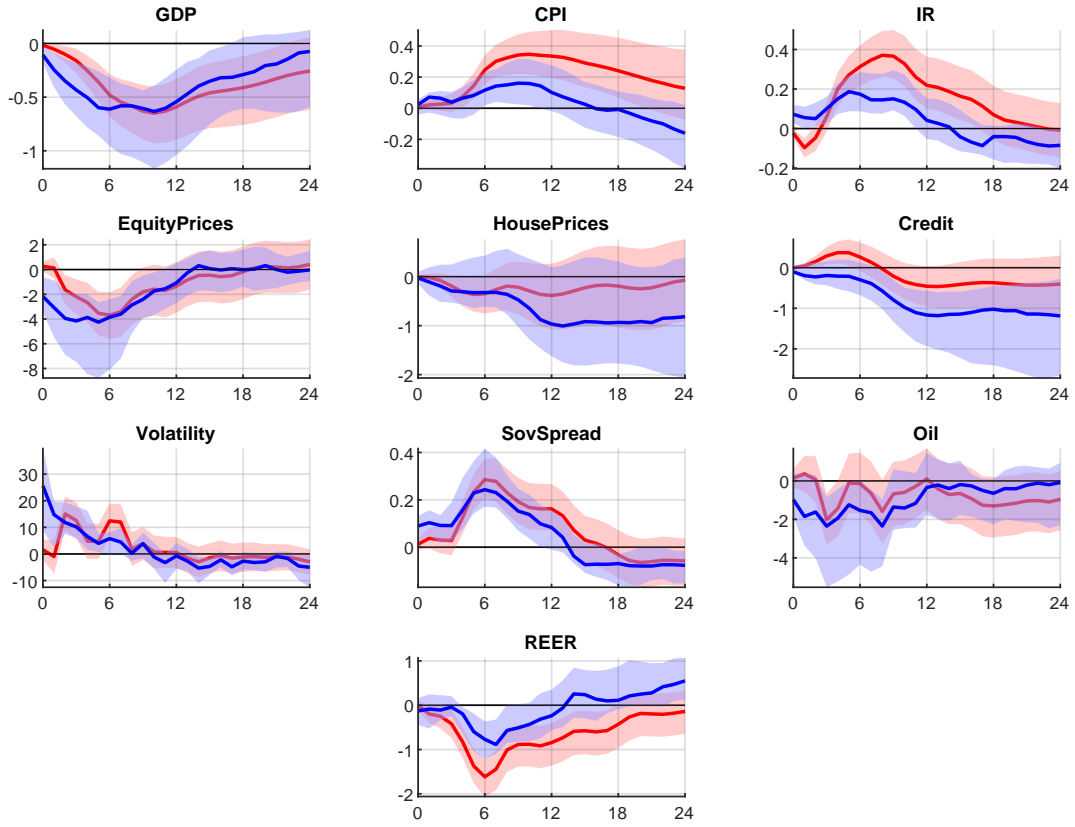
Figure 14: Impact of Russian GPR shock using Cholesky ordering (red) and Russian GPR shock using narrative sign restrictions (blue) on Russian economy

Notes: Figure shows the impulse responses of the Russian economy to two positive GPR shocks up to two years after a shock. Colored areas reflect the 68% highest density regions.

Table 11: Importance of Russian GPR shocks for economic fluctuations in Russia

Identification scheme:	Narrative sign restrictions	Cholesky
GDP	19	12
CPI	4	10
IR	5	17
EquityPrices	15	6
HousePrices	5	1
Credit	9	2
Volatility	17	10
SovSpread	16	14
Oil	6	2
REER	6	18

Notes: Forecast error variance decomposition over first two years after a shock, identified from the Russian GPR index via Cholesky decomposition or using narrative sign restrictions following Antolín-Díaz and Rubio-Ramírez (2018), in %. The restrictions are that (i) a GPR shock raises the Russian GPR index and (ii) the onset of the Russo-Georgian War and the Russo-Ukrainian War mark dates where the GPR shock is positive and contributes most strongly to the fluctuations in the Russian GPR index, relative to the sum of all other shocks on these dates.

H Principal component analysis of GPR indices

In this section, we analyse the relevance of a common component in the different GPR indices and its impact on the Russian economy. Specifically, we extract the first principal component of the Russian, Anglosphere, Ukrainian, and German GPR indices.

This first principal component explains 57% of the variation in these series. We call this component the common GPR measure. Despite this relatively low common variation explained, the first principal component is relatively well correlated with the single GPR indices, except for the Ukrainian one. Specifically, this component has a correlation of 0.85 with the Russian GPR index, followed by 0.83 and 0.80 with the Anglosphere and German GPR indices. The Ukrainian GPR shows a much weaker correlation (0.48).

Next, we identify a shock to this common GPR index in our BSVAR framework. We present the impulse responses together with the Russian GPR shock in Figure 15, and Table 12 provides the forecast error variance decompositions (FEVDs) for all different shock definitions.
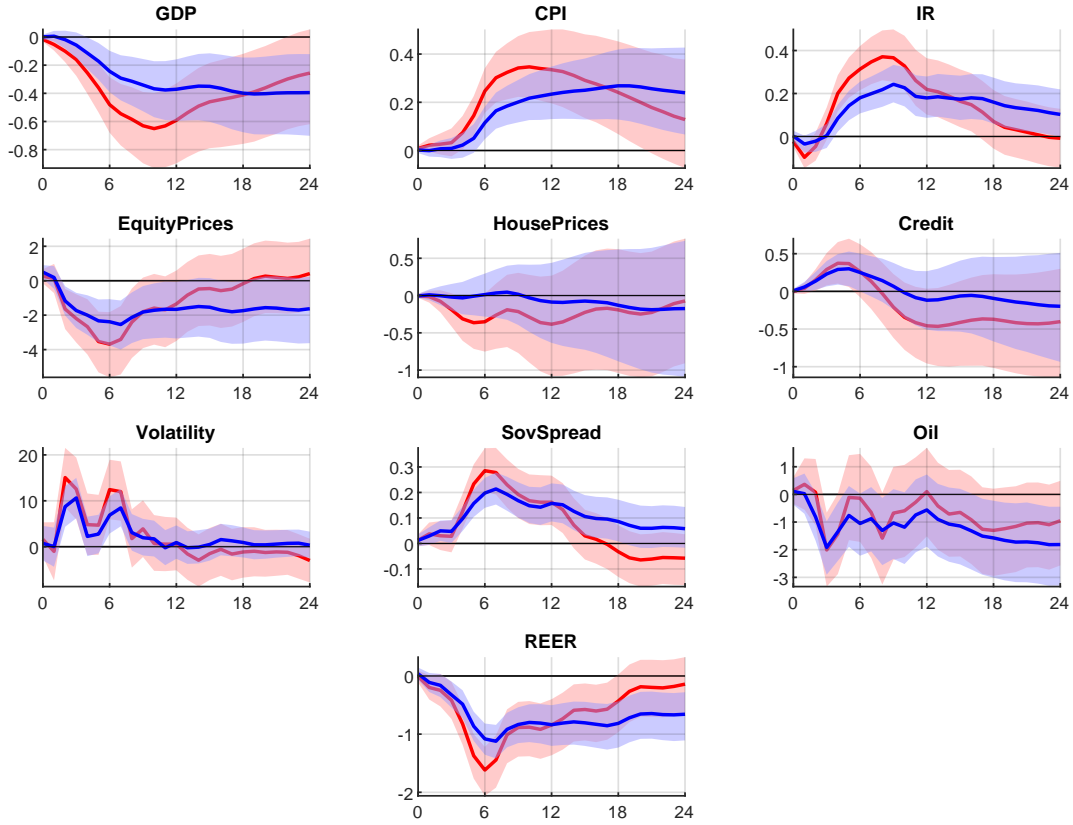

Figure 15: Impact of Russian GPR shock (red) and Common GPR shock (blue) on Russian economy

Notes: Figure shows the impulse responses of the Russian economy to two positive GPR shocks up to two years after a shock. Colored areas reflect the 68% highest density regions.

The findings reveal that, while shocks to the common component significantly affect the Russian economy, the Russian GPR shock has a more pronounced impact. This highlights three important points. First, it once more underscores the significance of local percep-

Table 12: Importance of GPR shocks for economic fluctuations in Russia

GPR index	Russia	Anglos.	Ukraine	Germany	Common
GDP	12	1	3	1	5
CPI	10	0	4	3	6
IR	17	1	15	2	9
EquityPrices	6	1	3	2	4
HousePrices	1	1	0	4	5
Credit	2	1	0	3	1
Volatility	10	3	2	3	0
SovSpread	14	1	12	5	15
Oil	2	3	3	1	3
REER	18	4	10	5	11

Notes: Forecast error variance decomposition over first two years after a shock, identified from the respective GPR index via Cholesky decomposition, in %. "Russia" refers to shocks identified from the Russian GPR index, "Anglos." to the Anglosphere GPR index, "Ukraine" to the Ukrainian GPR index, "Germany" to the German GPR index, and "Common" to a shock identified from the first principal component of "Russia", "Anglosphere", "Ukraine", and "Germany".

tions in understanding local economic dynamics. Second, a shock to this common GPR index predominantly affects international variables, such as the real effective exchange rate (REER) and the sovereign spread, while domestic variables are much less affected. Third, though smaller in importance, the common GPR shock has a more persistent impact on many of the variables in the system.

I Sanctions intensity index

Search query for Russian sanctions intensity index

In Russian: эконом* AND санкци* AND (против OR в отношении) AND Росси*
NOT (Сири* OR Иран* OR (Северн* near1 Коре*) OR Венесуэлл*)

English translation: economic* AND sanction* AND (against OR concerning to) AND
Russia NOT (Syria OR Iran OR (North near1 Korea) OR Venezuela)

Search query for Anglosphere sanctions intensity index

economic* AND sanction* AND (against OR concerning to)
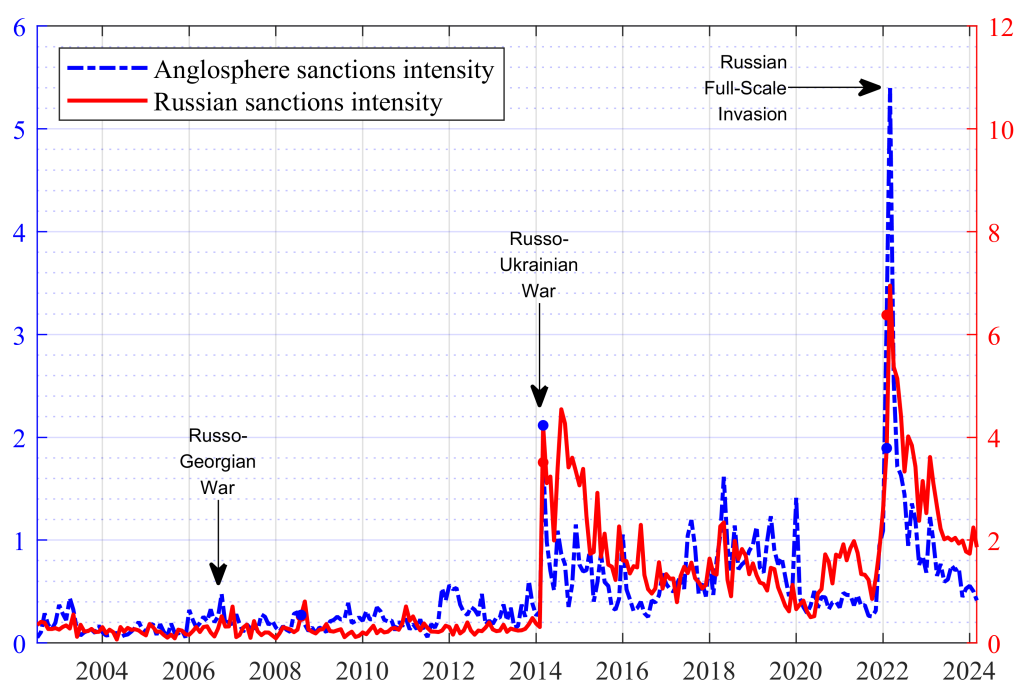

Figure 16: Sanctions intensity indicator based on English-language newspapers ("Anglo-sphere", left axis) vs Russian newspapers (right axis)