Geopolitical Risk Perceptions*

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October 27, 2023

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 local geopolitical risk shocks 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.

* Corresponding author: Yves Schüler (yves.schueler@bundesbank.de). The authors thank Emanuel Mönch, Steven Ongena, Yevhenii Skok, Laura Solanko, Christoph Trebesch, and participants at the Bank of Finland 7th European Workshop on Political Macroeconomics, C.r.e.d.i.t. 2023 Conference on Social, Sovereign and Geopolitical Risk, RCEA-Europe Conference on Global Threats to the World Economy, Bundesbank seminar, and the Estonian Christmas seminar for helpful comments. The views expressed in this paper are those of the authors and do not necessarily coincide with the views of the Deutsche Bundesbank or the Eurosystem.

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). 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.[1] 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.[2]

To understand the importance of those factors, we extend the seminal work by Caldara and Iacoviello (2022, hereafter CI), adding a local view to their measurement of geopolitical risk. Using Russia as a case study, we construct a monthly news-based geopolitical risk measure that is based on Russian local news, rather than on sources from the United States, United Kingdom, and Canada as proposed by CI, which we call the anglosphere GPR measure. We also develop a Ukrainian and a German GPR measure. This allows us to compare local Russian geopolitical risk 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 indexes 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 analyse the interplay of GPR and sanctions.

Our findings highlight the importance of taking into account local factors when tracking geopolitical risk in Russia. First, we show that our local 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 local Russian GPR measure has strong adverse effects on the Russian economy, whereas a shock to the anglosphere GPR measure does not. An adverse local GPR shock affects several dimensions of the Russian economy. Among others, output drops strongly, while prices and

[1] 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.

[2] 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.

interest rates rise substantially.

Second, we show that local GPR shocks have negative effects on the Russian economy beyond the sanctions channel. Unsurprisingly, a local 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 local GPR shock has marginally weaker adverse effects on the Russian economy than does a shock to the state-controlled news-based local 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. (2022) show that the inflationary impact of higher commodity prices and currency depreciation offsets other potential deflationary effects in response to GPR shocks. We contribute to these papers by establishing the importance of local conditions for calculating geopolitical risk. While CI provide a general geopolitical risk indicator, they also provide country-specific indicators. However, all indicators have an implicit anglosphere perception as they are constructed from a set of newspapers from the United States, the United Kingdom and Canada.[3] Our indicator of geopolitical risk for Russia (and also for Ukraine and Germany) instead is based on local media sources. We show that shocks to the local measure of geopolitical risk has larger effects on the Russian economy than shocks to the anglosphere GPR measure.

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.

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. (2022) among others, disentangle the effect of sanctions on the Russian economy. Another economic dimension for this war is captured

[3] The country-specific indicators are actually based on three newspapers from the United States.

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 analyse the effects of GPR shocks on macroeconomic and financial market variables in Russia using vector autoregression analysis. Finally, Section 5 concludes.

2 Construction of local geopolitical risk indicators

This section describes how we construct local GPR indicators for Russia, Ukraine, and Germany. Building on the procedure of CI, we use textual analysis to construct a news-based GPR indicator. The 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 country-specific GPR indicators using local news sources in the language of the country under study, to which we refer as local GPR indicators. Incorporating local components, specifically language and media, in measuring country-specific risk sets our indicators apart. In contrast to this, the GPR index of CI arguably reflects geopolitical risk from an anglosphere perception 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 the underlying perception, we denote their seminal indicator as anglosphere GPR.

Table 1 summarizes the news sources underlying our local GPR indexes. We chose a set of newspapers with the highest circulation in a given country to maximize the breadth of press coverage when building text-based indicators, as suggested in Andres-Escayola et al. (2022). For comparability, we exclude tabloids and regional newspapers. We use the newspaper archive from Dow Jones Factiva and select the largest national newspapers available in this database.

In constructing local GPR indicators, we also adapt CI's search query to the language and specifics of each country studied.[4] 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 ("") based on the dictionary are " ", " ", "", and " ". However, it turns out that not all of these words are actually related to geopolitical risk. The word " " means Second World War, while the word "" is mostly used in the context of sport competitions. Therefore, we exclude these two words. The query contains then the

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

Table 1: Newspaper sources underlying geopolitical risk indexes

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, Sьddeutsche 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

initial word for war "" and only the two relevant synonyms " " and " ". To be precise, our query contains only a part of the word "war", namely "*" so that we simultaneously also cover its plural form (""). Appendix A shows the search query for each country.

For Russia, we also have to account for the limited press freedom and thus the different nature of newspapers in circulation. The 20th World Press Freedom Index published by Reporters Without Borders in 2022 ranked Russia 155 out of 180 countries. We construct the Russian GPR index using state-controlled media and independent media jointly.[5] 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 are 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 the local GPR indicators, we replicate the anglosphere GPR indicator using the Factiva database and use the replicated indicator in our analysis.[6]

[5] An overview of independent media sources in Russia can be obtained here: https://like-a.ru/hozyajke-na-zametku-polnyj-spisok-iz-17-a/.

[6] 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. First, taking a local perspective results in a vastly 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 Country-specific measures of geopolitical risk

Figure 1 shows geopolitical risk from the Russian perception together with the anglosphere GPR index from June 2002 to December 2022.

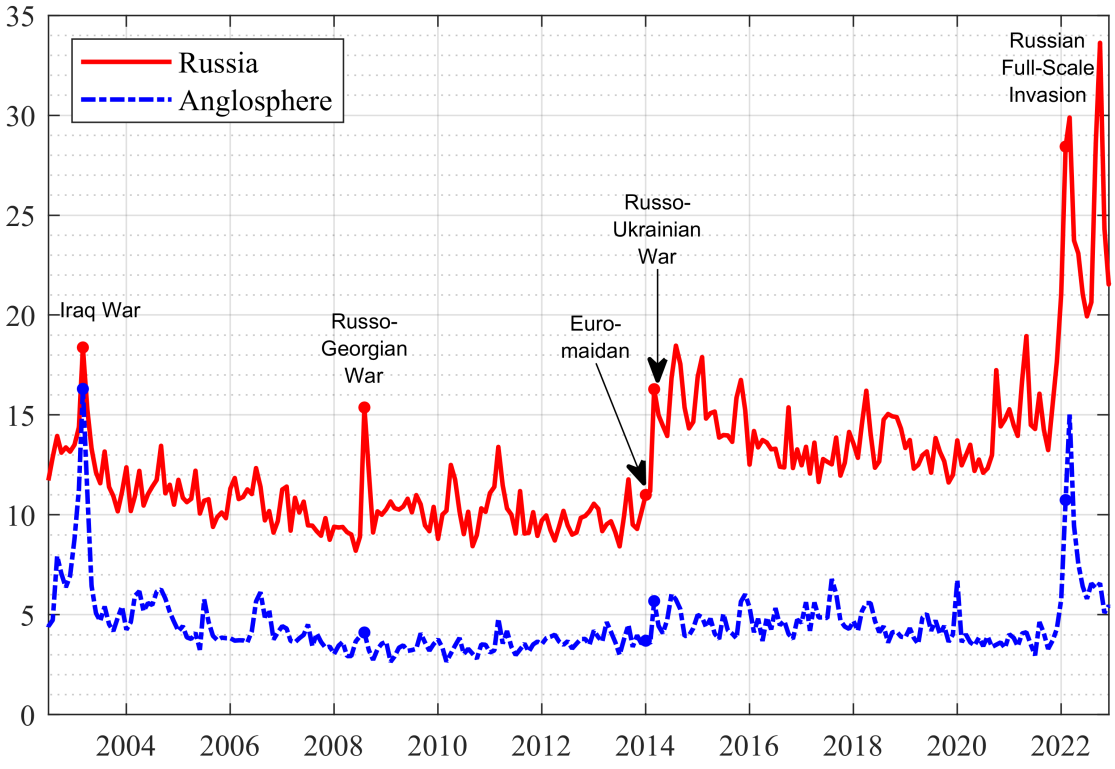

Figure 1: Geopolitical risk from a Russian versus anglosphere perception

The difference in the levels of the two indexes stands out immediately. The Russian GPR index is roughly twice as high as the anglosphere GPR. This could mean that Russian

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

media use in general more words related to geopolitical risk than do English-speaking media. It could, however, also simply be associated with specifics of the Russian language, which would then be unrelated to geopolitical risk measurement.[7]

Therefore, we focus on the differing dynamics of the two series. For instance, the spike in the local Russian GPR series pertaining to the Russo-Georgian War in 2008 clearly stands out from the rest of the series. Also, the Euromaidan followed by the Russo-Ukrainian War in 2014 are visible as an upward level shift in the local 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 from a Russian perception.

Importantly, the differing dynamics are not limited to the Russian and anglosphere GPR indexes, as we can see from Table 2. The table shows the correlation coefficients of the local 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 indexes 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. If we would extend the series until end of December in 2022, the correlation among the indexes increases significantly.[8] The reason, of course, is the geopolitical risk shock related to the Russo-Ukrainian War.

Table 2: Correlation matrix of country-specific GPR indexes

↓ 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 local GPR indexes for Russia, Ukraine, Germany, United Kingdom and United States depicted in Figure 2. The figure shows a distinction

[7] For instance, in constructing the GPR indicators, CI propose to divide 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.

[8] See Appendix C for the correlations constructed with data that include 2022.

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 the 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 local GPR indexes. 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.

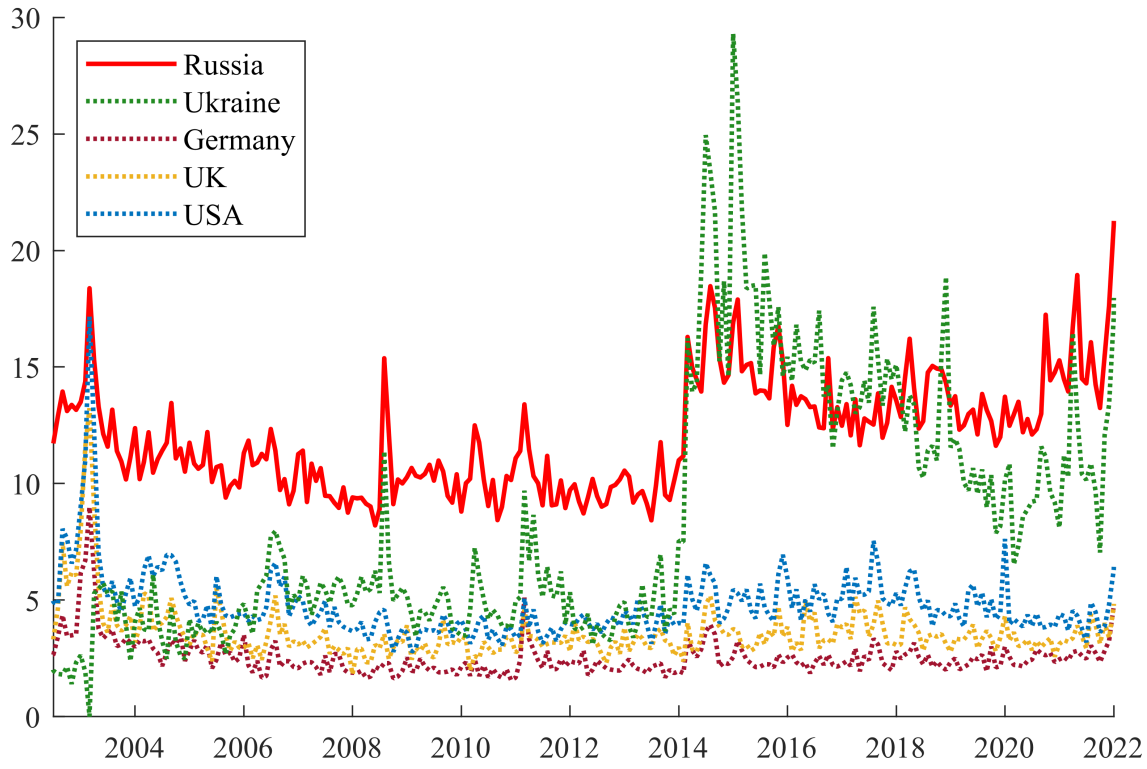

Figure 2: Local geopolitical risk indicators for selected countries

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 indexes for Russia and for Ukraine with the anglosphere GPR. The first thing to note in Figure 3 is the increase in the GPR indexes 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 local 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 local GPR indicators in addition to a GPR index based solely on English-speaking newspapers.

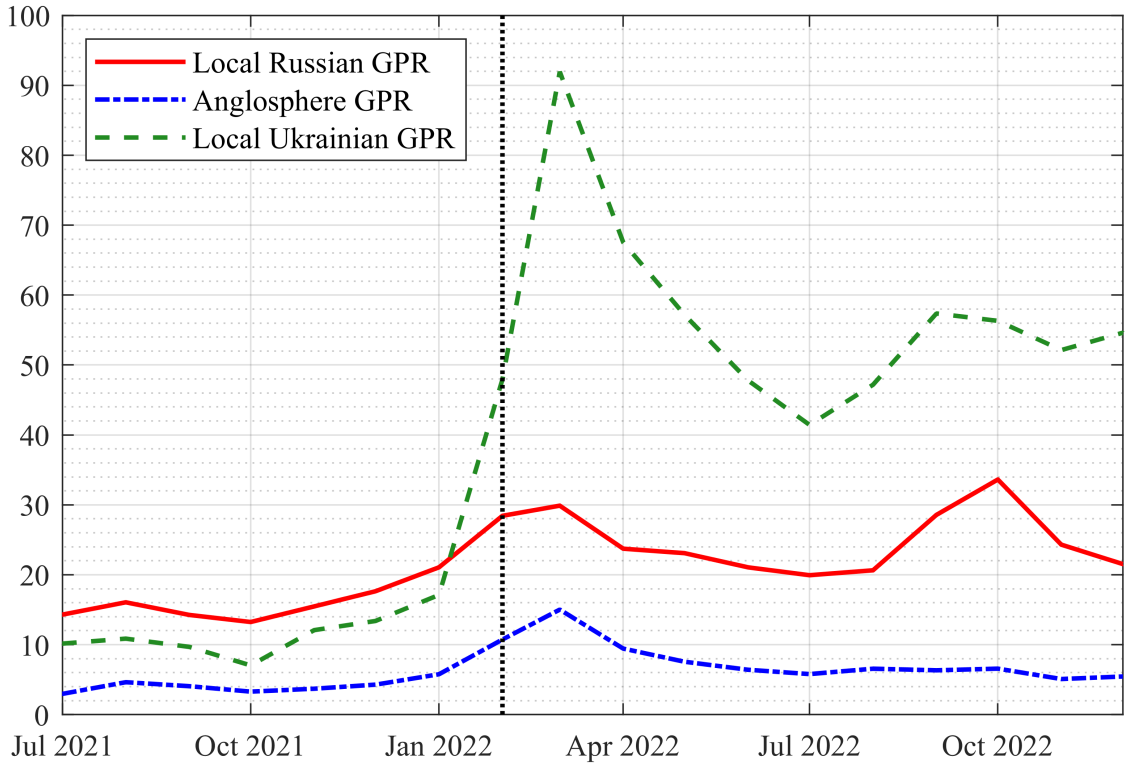

Figure 3: Geopolitical risk perceptions around the Russian full-scale invasion of Ukraine

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 GPR index based on state-controlled media and the 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.

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.

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	R, A, RI
March 2003	Iraq war	R, A, RS	R, A, RS	R, A, RS
August 2003	Aggravation of hostilities in Iraq and Afghanistan	RI	RI	All
July 2005	London bombings 7/7	A	A	A
August 2008	War in Georgia	R, RI, RS	R, RI, RS	R, RI, RS
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	A, RS
January 2020	US / Iran tensions escalate	A	R, A, RS	All
October 2020	Second Karabakh War	R	R, RI	R, RI
August 2021	Terrorist attack at Kabul airport, Afghanistan. US completes 20-year mission in Afghanistan	A	A	R, A, RI
February 2022	Full-scale invasion in Ukraine	R, A, RS	All	All
March 2022	War in Ukraine. Moldova and Georgia apply for EU membership. The Council of Europe officially expells Russia from the organization	RS	A, RS	A, RS
September 2022	Partial mobilization in Russia. Nord Stream and Nord Stream 2 accidents. Annexation of the occupied territories of Ukraine	R, RI, RS	R, RI, RS	R, RI, RS

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.

Figure 4 depicts the Russia 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.

Overall, the GPR index based on state-controlled news sources is lower than the one computed from independent sources. This discrepancy supports the view 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

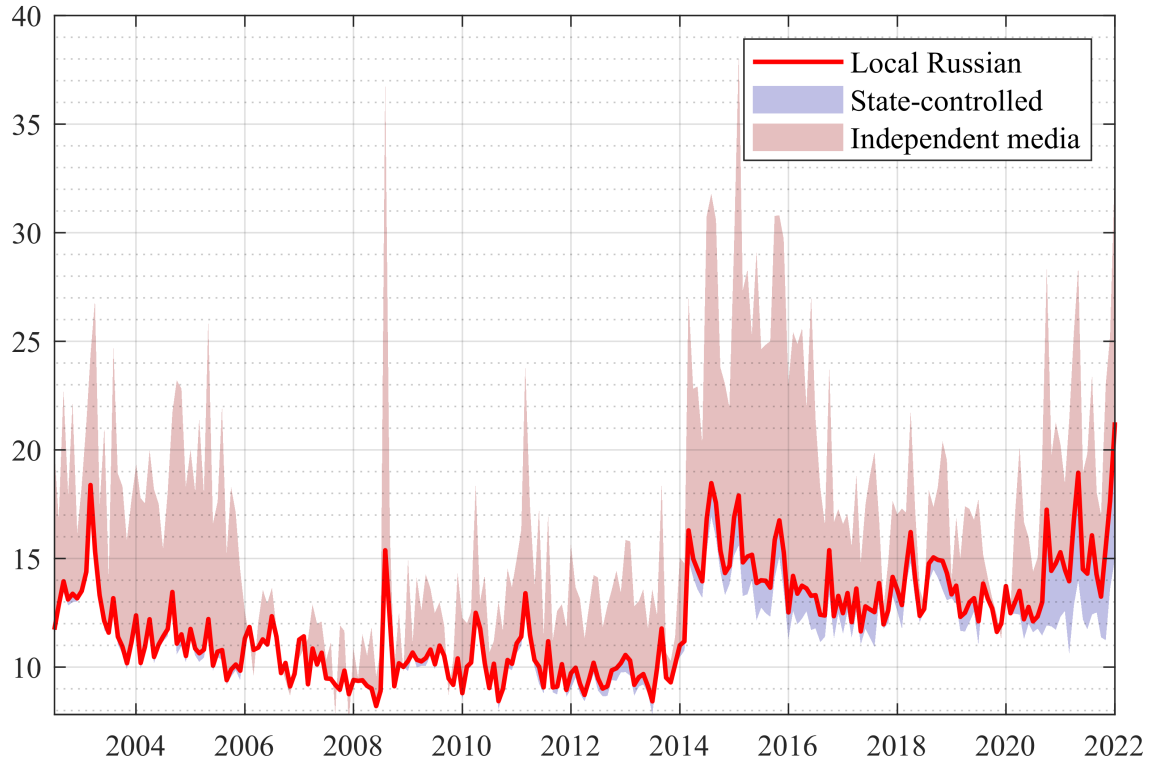

Figure 4: Geopolitical risk: state-controlled versus independent media sources

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 local and anglosphere geopolitical risk and assess how the underlying media's degree of freedom affects the impact. Finally, we assess the role of sanctions for the transmission of geopolitical risk.

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 local 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 financial variables, we use 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 the quarterly frequency. We convert these time series to the monthly frequency by interpolation with a cubic spline. Please see Appendix D 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 BSVAR 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 $n \times n$.

Following CI, 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. We also check for robustness with respect to the ordering. Overall, our conclusions remain the same. Please see Appendix F for further details.

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, we slightly increase the value for λ_1 (tightness of beliefs around the random walk prior) expressing less certainty around these beliefs. Note this approach also uses dummy observations as part of the prior. Finally, we use 15,000 draws, of which we discard 5,000 as burn-in draws.

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 local 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.

Shock to local Russian GPR index. Figure 5 depicts the impulse responses to a GPR shock, which is identified with the local 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 local 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.

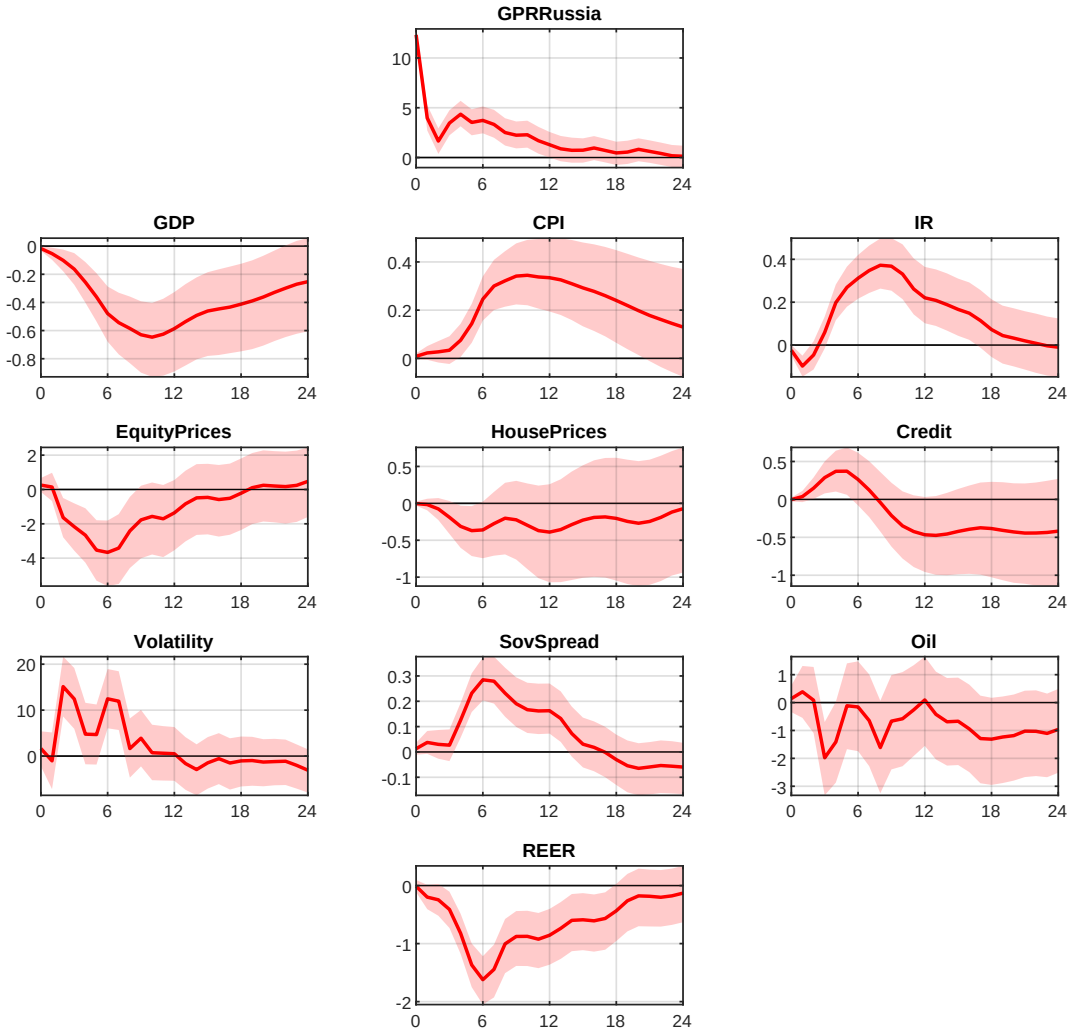

Figure 5: Impact of Russian GPR shock on Russian economy

Notes: Figure shows the impulses responses of the Russian economy to a 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 to local Russian versus anglosphere GPR index. We replace the local 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 local 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, neither 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 local 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

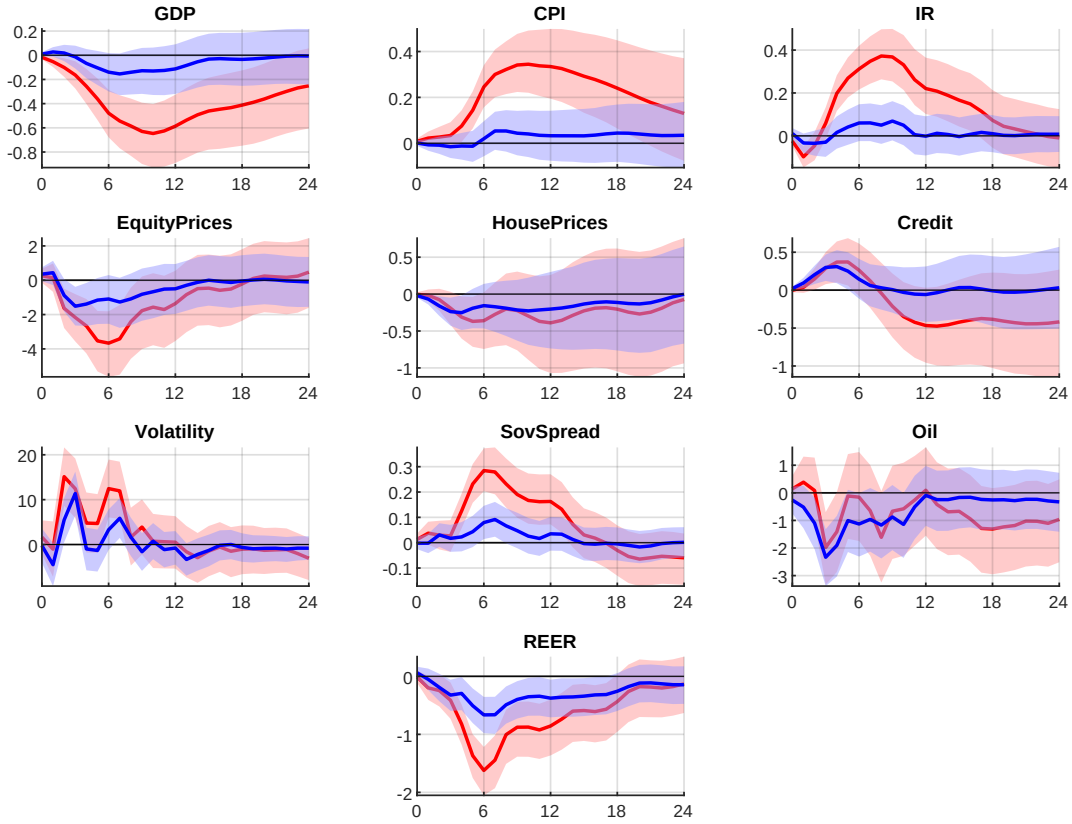

Figure 6: Impact of Russian GPR shock (red) and anglosphere GPR shock (blue) on Russian economy

Notes: Figure shows the impulses 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.

more details on the impulse responses, please see Appendix E. 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 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

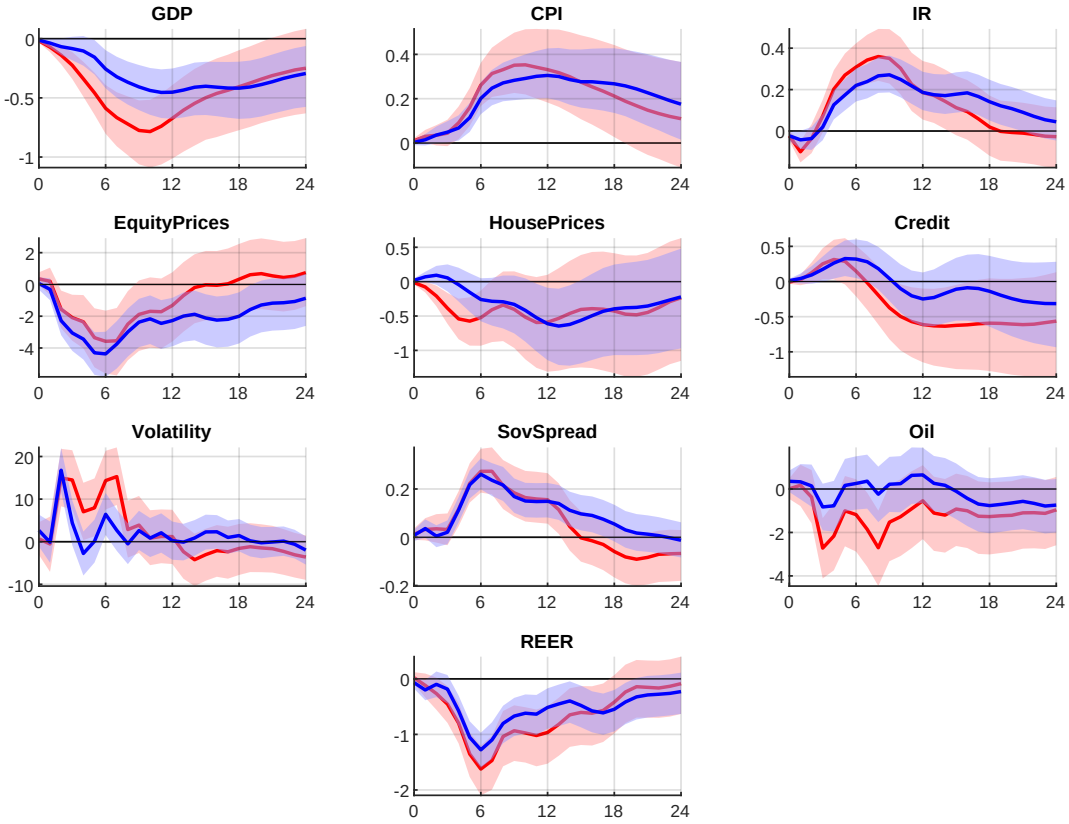

Figure 7: Impact of Russian state-controlled (red) and Russian independent (blue) media GPR shock on Russian economy

Notes: Figure shows the impulses 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.

reports only on 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 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 section, see Table 4. This decomposition indicates the relative importance of GPR shocks in explaining the fluctuations of the variables in the system.

The exercise suggests that only local Russian GPR shocks matter, relative to non-local GPR shocks. For instance, a local 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 geopolitical risk shocks using GPR indexes based on news sources from other countries, such as Ukraine or Germany. Using the local 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 local geopolitical risk perceptions is critical to obtain an accurate picture of its impact on the Russian economy.

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 %. "Local" refers to the Russia GPR index, "-State" to the Russia GPR index using state-controlled media, "-Indep." to the Russia 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 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%, while 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).

4.5 Geopolitical risk and sanctions

Now, we focus on the role of sanctions for the transmission of geopolitical risk. Sanctions are often imposed in response to geopolitical threats or acts. Specifically, economic sanctions are used by countries (the senders) to restrict or prohibit specific economic activities with another country (the target). Importantly, both types – senders and the target – are affected by sanctions. In this sense, sanctions likely play an important part in the transmission of geopolitical risk. We refer to this channel as the sanctions channel of geopolitical risk.

The aim of this section is to evaluate and quantify the sanctions channel in order to better understand the transmission of geopolitical risk. Accounting for this channel also enables us to run a counterfactual analysis that examines how geopolitical risk would transmit under a different sanction intensity.

Clearly, an analysis of the sanctions channel is particularly desirable for our case study of Russia since this country has been subject to economic and financial sanctions in response to its geopolitical actions. Specifically, in terms of the number of sanctions that have been imposed against a particular country, Russia occupies a leading position, significantly ahead of Iran, Syria and South Korea.

Constructing a sanctions indicator for Russia. To evaluate the sanctions channel, 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 newspapers sources, similar to CI.

We deviate from Laudati and Pesaran (2023) by taking a local perspective when constructing the sanctions 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 index. Furthermore, differently from the original paper, we do not account for the possibility that sanctions were lifted. To the best of our knowledge, sanctions against Russia have not been suspended or canceled over our sample period.[9]

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

[9] Appendix G provides the search query in English and its translated version.

can have adverse effects on both the target and the sender country (see, e.g., Besede 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, which allows us to include it directly in our empirical 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 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.

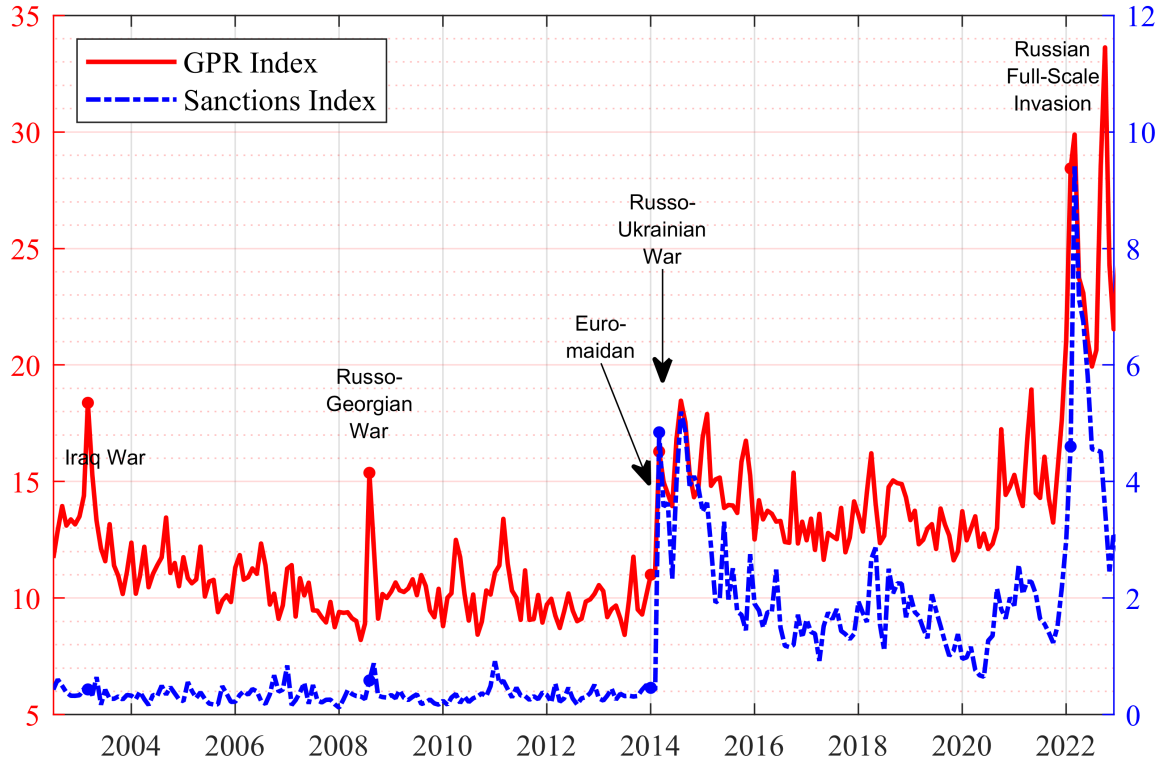

Figure 8: Geopolitical risk indicator and sanctions intensity indicator

Our novel sanctions intensity index for Russia is shown in Figure 8 as a dashed blue line. For better interpretation, the figure also depicts our geopolitical risk indicator for Russia. To begin with, the sanctions index was mostly very low until 2014. However, there were some small spikes around geopolitical events, such as the Russo-Georgian war. Even though no sanctions were imposed on Russia 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 the level of the sanctions index slowly fell over time in the following years, our indicator remained at an elevated level. This indicates the long-lasting impact of sanctions that result from direct and indirect effects. 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 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 resulted in increased sanctions.

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

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 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 risk 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. For instance, the sanctions that were imposed in 2014 occurred after the beginning of the Russo-Ukrainian war.

Figure 9 displays the impulse responses for the model with the sanctions indicator (shown in red lines). The impulse responses indicate that a shock to geopolitical risk significantly increases the sanctions index by approximately 10%. For the remaining variables, the results highlight that the effects of the geopolitical risk shock are qualitatively and quantitatively similar to our baseline estimation without the sanctions indicator (see Figure 5). Regardless of the inclusion of the sanctions 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 index as a variable. The dynamic interdependencies are summarized by the estimated coefficient matrices $\hat{A}_i$, $\forall i = 0, 1, \dots 12$

(see also Equation 1).[10] We manipulate the estimated coefficients ex-post, shutting down any impact of the geopolitical risk shock on the sanctions index, i.e., also through a third variable. This implies that the response of the sanctions 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 as:

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

where the brackets indicate the elements that are selected.

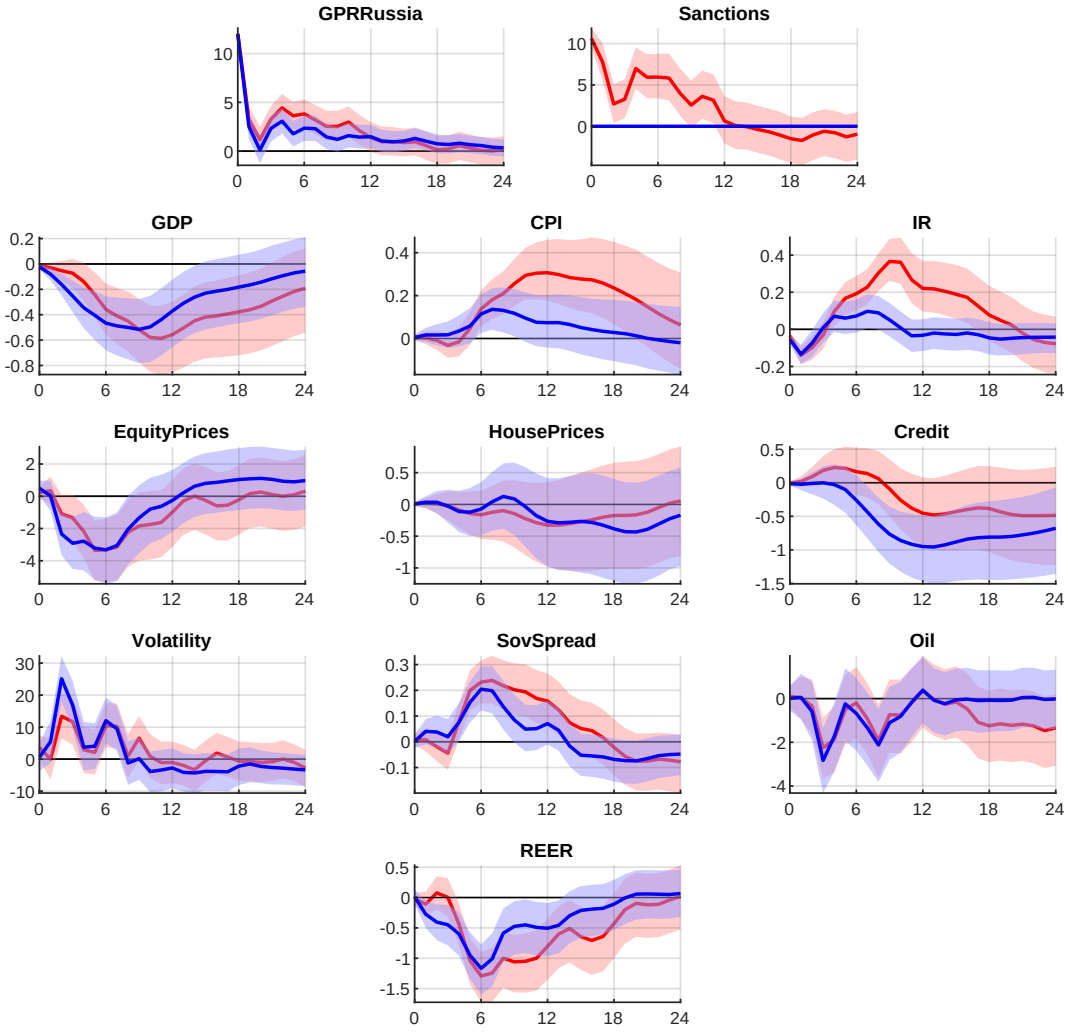

Figure 9: Impact of Russian GPR shock with sanctions channel: Active (red) vs. non-active (blue)

Notes: Figure shows the impulses 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.

[10] 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.

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 the strategy is subject to the Lucas critique.

The counterfactual path in the absence of the sanctions channel is shown in blue in Figure 9. As can be seen in the figure, the response of the sanctions 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 brings about sanctions, which in turn prolong geopolitical risk for Russia. Put differently, without sanctions geopolitical risk from the point of view of 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 strongly 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.

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 local geopolitical risk shocks are important beyond the sanctions channel, as, for instance, the fall in GDP is substantial even when sanctions are absent.

5 Conclusion

Geopolitical risk (GPR) shocks have dire economic consequences: they lower output, investment, and stock prices; and they raise inflation. In this paper, we highlight that news reporting about geopolitical events can differ markedly across countries and types of news media. We extend the seminal work by Caldara and Iacoviello (2022) and construct local news-based measures of geopolitical risk. Studying the transmission of GPR shocks to the Russian economy, our findings are threefold. First, we show that a rise in the local Russian GPR measure has strong adverse effects on the local economy, while a rise in other GPR measures does not. Second, we find that Russian geopolitical risk 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.

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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 5.

Table 5: 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*"

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 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 , and the words and .

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: ((* OR * OR * OR * OR * OR * OR OR * OR OR * OR * OR *) near2 (OR OR OR OR * OR OR * OR * OR OR)) OR ((OR * OR * OR к* * *ь OR к ь OR OR OR *) near2 (* OR OR * OR * OR * OR OR * OR * OR *)) OR ((* OR * OR OR к ь OR * OR * OR * OR * OR * OR * OR OR * OR *) AND (* OR * OR * OR * OR * OR * OR OR * OR OR * OR * OR *)) OR ((* OR * OR к* *ь

OR к* *ь OR к* *ь OR * OR * OR * OR к* *ь OR к* * *ь) AND (OR OR OR OR * OR OR * OR * OR OR)) OR ((* OR) near2 (OR.. OR OR OR * OR OR * OR * OR OR)) OR ((* OR к* *ь OR к* *ь OR * OR * OR * OR OR * OR OR * OR *) near2 (* OR * OR * OR * OR *)) OR ((* OR * OR * OR * OR * OR к* *ь OR к-* *ь OR * OR * OR OR *) near2 (* OR * OR * OR * OR * OR * OR * OR * OR * OR *)) OR ((OR) near2 (* OR * OR * OR * OR * OR * OR * OR * OR OR * OR к ь)) NOT (OR * OR OR OR OR OR OR OR OR * OR * OR * OR * OR * OR * OR * OR OR OR).

Search query for counting the total number of articles for Russia: "" AND "" AND "" AND "" AND "" AND ""

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 languages. This is necessary because almost every information source in Ukraine is published in both languages. Since 2014, there has been a significant reduction in publications in the Russian language.

Ukrainian search query in Russian language for geopolitical risk: ((* OR * OR * OR * OR * OR * OR OR * OR OR * OR * OR * OR) near2 (OR OR OR OR * OR OR * OR * OR OR)) OR ((OR * OR * OR к* * *ь OR к ь OR OR OR *) near2 (* OR OR * OR * OR OR * OR * OR *)) OR ((* OR * OR OR к ь OR * OR * OR * OR * OR * OR OR * OR * OR *) AND (* OR * OR * OR * OR * OR OR * OR * OR OR * OR *)) AND ((* OR * OR к* *ь OR к* *ь OR к* *ь OR * OR * OR * OR к* *ь OR к* * *ь) AND (OR OR OR OR * OR OR * OR * OR OR)) OR ((* OR) near2 (OR OR OR OR * OR OR * OR * OR OR)) OR ((* OR * OR * OR * OR * OR * OR OR * OR OR * OR * OR * OR) near2 (* OR * OR * OR * OR *))OR ((* OR * OR * OR * OR к* *ь OR к-* *ь OR * OR * OR OR *) near2 (* OR * OR * OR * OR * OR * OR * OR * OR * OR *) OR ((* OR) near2 (* OR * OR * OR * OR * OR * OR * OR * OR OR * OR к ь)) NOT (OR * OR OR OR OR OR OR OR OR * OR * OR * OR * OR * OR * OR * OR OR OR)).

Ukrainian search query in Ukrainian language for geopolitical risk: ((* OR * OR * OR * OR * OR * OR OR * OR OR * OR * OR * OR) near2 (OR * OR * OR * OR * OR * OR * OR * OR * OR * OR * OR *)) OR ((* OR * OR * OR к* * ь OR к* *ь OR OR * OR * OR OR *) near2 (* OR * OR * OR * OR OR * OR *)) OR ((* OR * OR * OR * OR к* *ь OR * OR * OR * OR * OR * OR * OR *) AND (* OR * OR * OR * OR * OR OR * OR OR * OR *)) AND ((* OR * OR к* *ь OR к* *ь OR к* *ь OR * OR * OR * OR к* *ь OR "* * *") AND (OR * OR * OR * OR * OR * OR * OR * OR * OR * OR

* OR * OR *)) OR ((* OR *) near2 (OR * OR * OR * OR * OR * OR * OR * OR * OR * OR *)) OR ((* OR * OR * OR * OR * OR * OR * OR OR * OR OR * OR * OR * OR) near2 (OR * OR * OR * OR * OR *))OR ((* OR * OR * OR * OR к* *нь OR к-* *нь OR * OR * OR * OR *) near2 (* OR * OR * OR * OR * OR * OR * OR * OR *) OR ((* OR *) near2 (OR * OR * OR * OR * OR * OR * OR OR к нь)) NOT (OR * OR OR OR OR OR OR ' OR OR * OR * OR * OR OR * OR * OR * OR OR OR)).

Search query for counting the total number of articles: ("" AND "" AND "" AND "") OR ("" AND "" AND "" AND "").

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 Befьrchtung* 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 ((Militдr* OR Truppen OR Rakete* OR Waffe* OR Bombe* OR Sprengk*) AND (Aufbau* OR Blockade* OR Sanktion* OR Embargo OR Quarantдne OR Ultimatum OR mobi-lis* 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 Befьrchtung* OR Spannung* OR Droh* OR unvermeid* OR erschreck*)) OR ((Terroris* OR Guerilla* OR Geisel*) near2 (Risiko* OR warn* OR Angst* OR Sorge* OR befьrcht* OR Ge-fahr* OR gefдhrlich* OR bedroh* OR zweifel* OR Krise OR Unruh* OR Auseinandersetzung* OR Disput* OR Streit* OR Bedenken* OR Befьrchtung* OR Spannung* OR droh* OR unver-meidlich OR Schreck*)) OR ((Krieg OR Konflikt OR Kampfhandl* OR Revolu-tion* OR Aufstand OR Revolte OR Staatsstreich OR geopolitisch*) near2 (beginn* OR begann OR be-gonn* OR Ausbruch OR "brach aus" OR start* OR anfang* OR erklдr* OR Verkьndung)) OR ((verbьndet* OR alliiert* OR feind* OR Gegner* OR Armee OR Streitkrдfte OR Marine OR Luft* OR Truppen OR Rebellen OR Aufst*) near2 (bombard* OR vorrьck* OR Vormarsch OR Einmarsch OR zusammenst* OR angr* OR ьberf* OR *schlag)) OR ((Terroris* OR Guerilla* OR Geisel*) near2 (Akt OR Tat OR Angriff OR Bombe* OR tцt* OR *schlag OR angr* OR entfьhr*)) 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 6: 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 7: 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, broadcasting on YouTube	Daily	2008

C Correlation among GPR measures, including 2022

Table 8: Correlation matrix of country-specific GPR indexes

↓ 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 Russo-Ukraine war.

D 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 Ruble. Furthermore, if we report two identifies, 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)

E BSVAR results for Ukraine and Germany

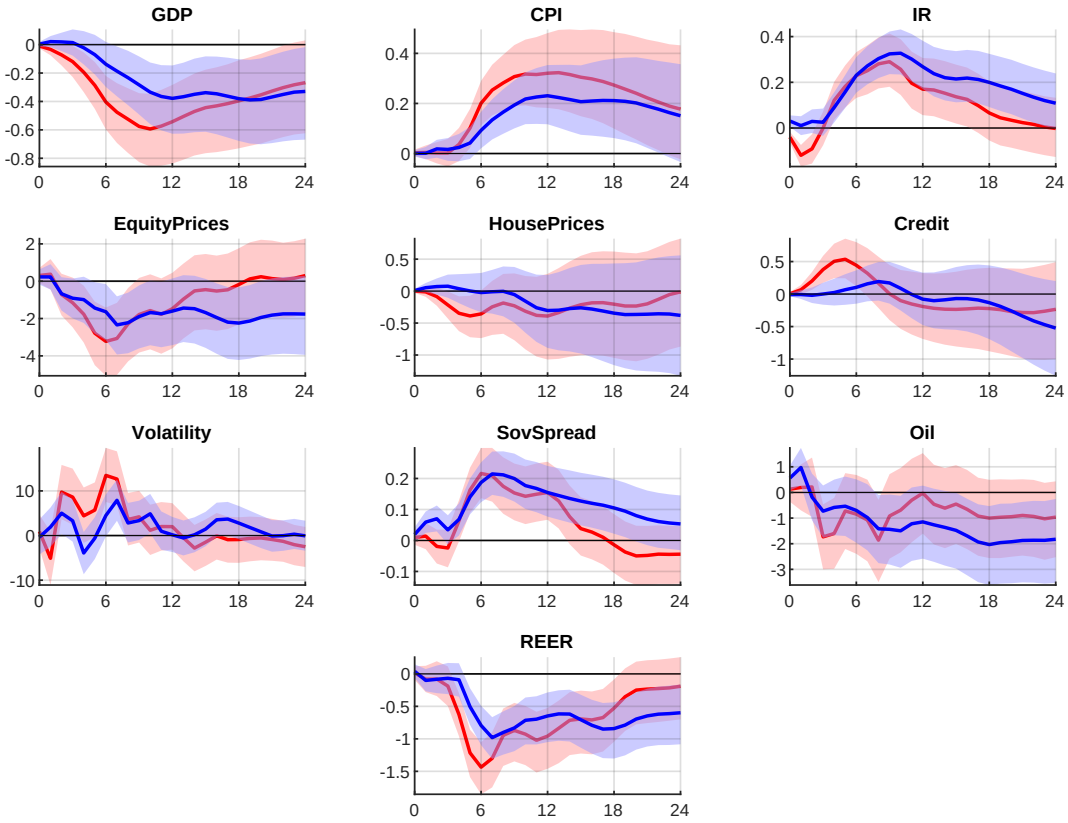

Figure 10: Impact of Russia (red) and Ukraine (blue) GPR shock on Russian economy

Notes: Figure shows the impulses 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.

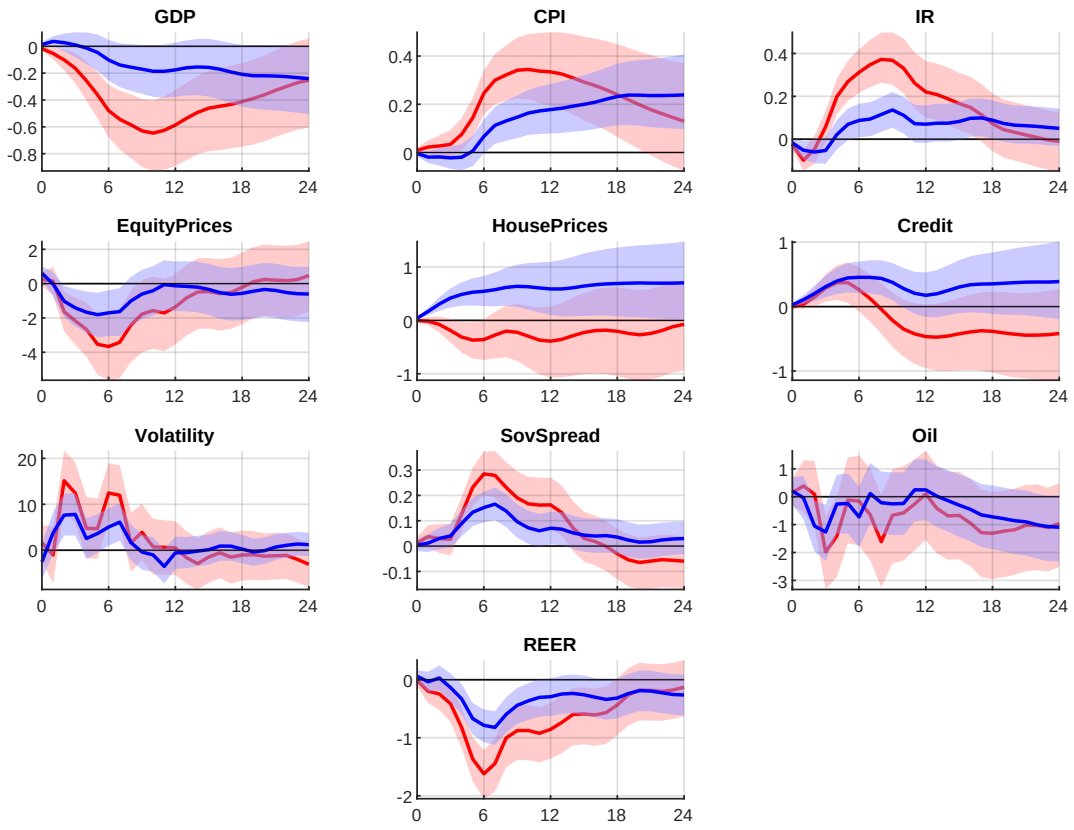

Figure 11: Impact of Russia (red) and Germany (blue) GPR shock on Russian economy

Notes: Figure shows the impulses 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.

F Robustness BSVAR results: No contemporaneous impact

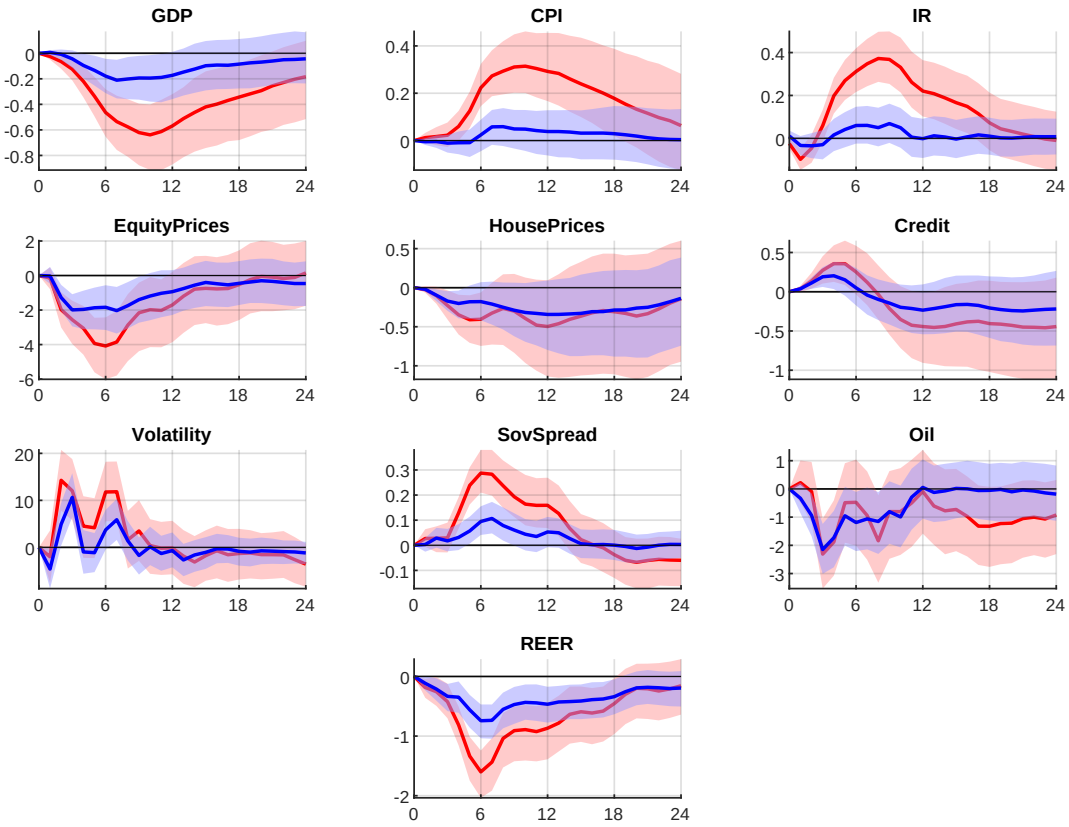

Figure 12: No contemporaneous impact: Russia GPR shock (red) and anglosphere GPR shock (blue) on Russian economy

Notes: Figure shows the impulses 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.

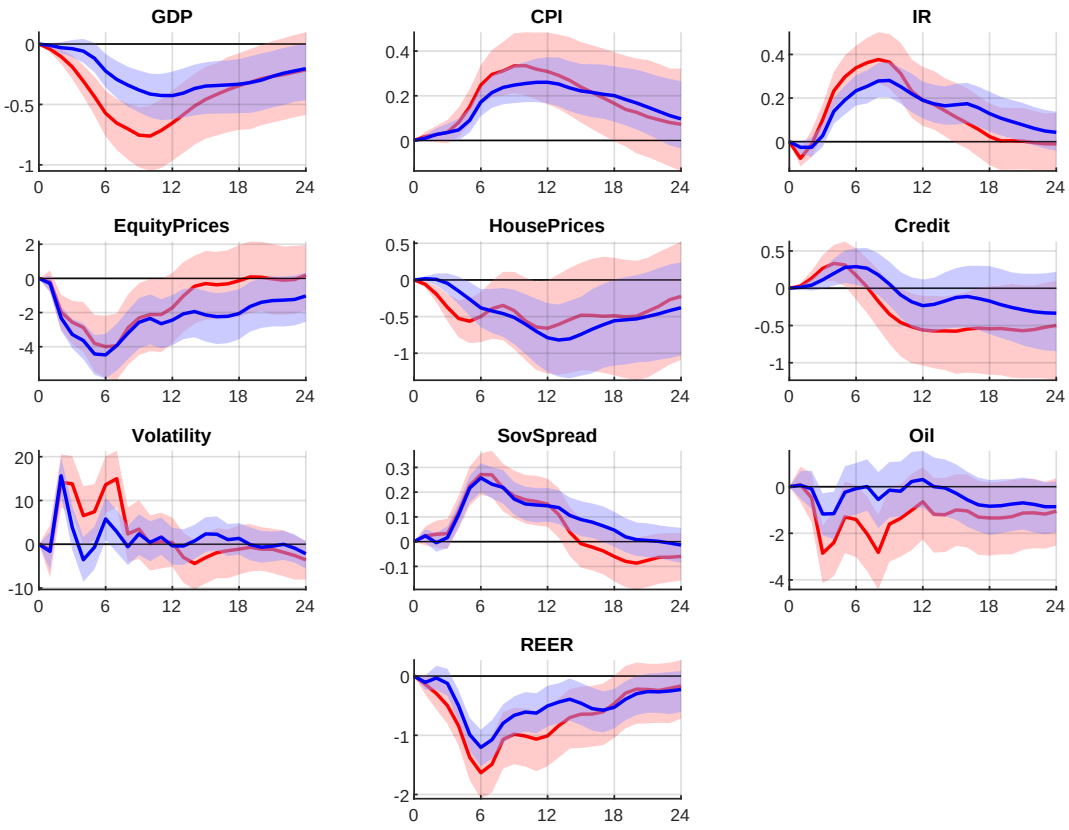

Figure 13: No contemporaneous impact: State-controlled (red) and independent (blue) media GPR shock on Russian economy

Notes: Figure shows the impulses 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.

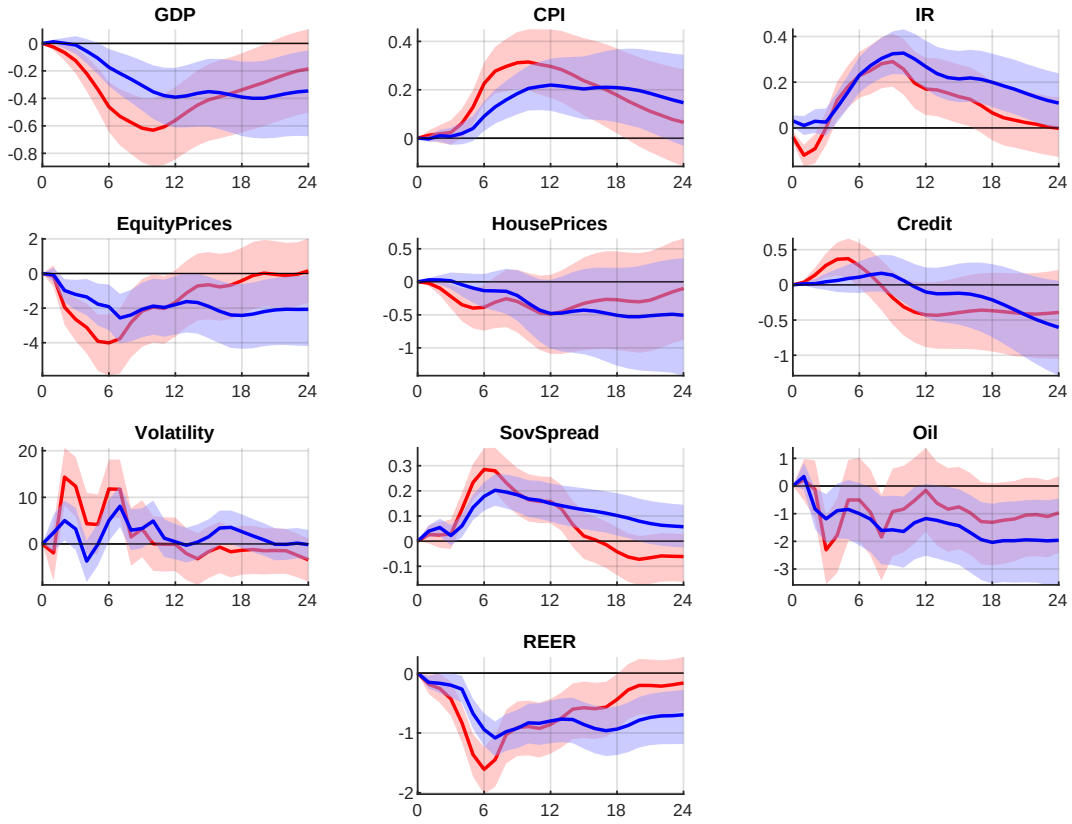

Figure 14: No contemporaneous impact: Russia (red) and Ukraine (blue) GPR shock on Russian economy

Notes: Figure shows the impulses 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.

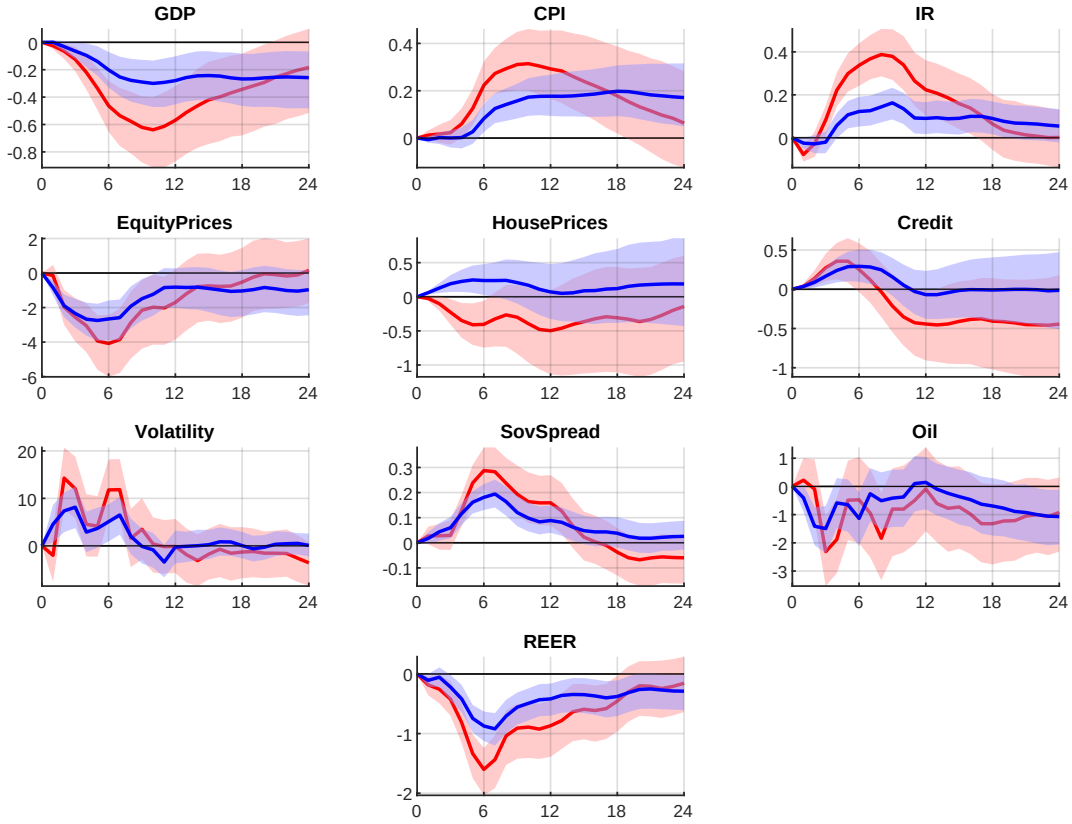

Figure 15: No contemporaneous impact: Russia (red) and Germany (blue) GPR shock on Russian economy

Notes: Figure shows the impulses 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.

Table 9: No contemporaneous impact: Importance of GPR shocks for economic fluctuations in Russia

GPR index :	Russia	-State	-Indep.	Anglos.	Ukraine	Germany
GDP	11	15	5	1	4	3
CPI	8	9	6	0	4	3
IR	19	17	12	1	11	3
EquityPrices	8	8	12	3	4	5
HousePrices	1	3	2	1	1	1
Credit	2	2	1	1	0	1
Volatility	9	12	5	3	2	3
SovSpread	15	13	13	2	10	7
Oil	2	5	1	2	3	1
REER	18	19	10	2	14	7

Notes: Forecast error variance decomposition over first two years after shock, in %. "Local" refers to the Russia GPR index, "-State" to the Russia GPR index using state-controlled media, "-Indep." to the Russia 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.

G Russian sanctions index

Search query in Russian for sanctions index: * AND * AND (OR) AND * NOT (* OR * OR (* near1 *) OR *)

Search query in English for sanctions index (simple translation): economic* AND sanction* AND (against OR concerning to) AND Russia NOT (Syria OR Iran OR (North near1 Korea) OR Venezuela)