

# Local geopolitical risk\*

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## Abstract

Using Russia as a case study, we highlight the importance of local factors for tracking geopolitical risk (GPR). Exploiting local Russian sources, we construct a news-based measure of GPR. This measure emphasizes key events for Russia. It evolves differently relative to other GPR measures that are based on non-local news sources. In addition, we show that a sudden rise in the local GPR measure has strong adverse effects on the Russian economy, while a sudden rise in any of the non-local GPR measures does not. We also account for the limited press freedom in Russia and analyze the role of the sanctions channel, relying on a novel sanctions intensity measure that we construct for Russia.

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

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

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# 1 Introduction

The Russo-Ukrainian war underlines, once more, the economic, but also human, social, and political costs of adverse geopolitical events. Due to these costs, central banks, governments, firms, but also investors, among others, closely track geopolitical risk.

Geopolitical risk is 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). Geopolitical risk, however, cannot be captured in an objective way. A variety of factors shape the perception of geopolitical risk, such as the *proximity* to a geopolitical risk factor, or simply a *nation’s stake* in a specific conflict. For instance, related to the Russian invasion of Ukraine, Mogliani, Sahuc, and Ferrara (2022) and Federle, Meier, Müller, and Sehn (2022) show that there are more severe economic consequences for countries located more closely to Russia. In the context of the Russian annexation of the Crimea, Simonov and Rao (2022) highlight the role of media biases in Russia, identifying stark differences in the reporting of state-controlled and independent media. Clearly, to correctly track geopolitical risk such local factors have to be taken into account.

Against this backdrop, we extend the seminal work by Caldara and Iacoviello (2022, hereafter CI), adding a local dimension to their measurement of geopolitical risk. Specifically, we use Russia as a case study and analyse the role of local geopolitical risk perceptions. To do so, we construct a monthly news-based geopolitical risk (GPR) 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 various other perceptions of geopolitical risk. To control for the low level of press freedom in Russia, we also propose two further GPR indexes for Russia, one based on independent media sources and the other based on state-controlled sources. Finally, following Laudati and Pesaran (2023), we develop a novel news-based sanctions intensity index for Russia that helps us to analyse the role of sanctions in the context of GPR.

Our findings highlight the importance of taking into account local factors when tracking geopolitical risk. First, we show that our local Russian GPR measure emphasizes key events for Russia and evolves markedly different relative to other GPR measures that are based on non-local news sources. But also beyond the case of Russia, we find that local factors matter, because each of our country-specific GPR measures (e.g., for Ukraine or Germany) evolves uniquely.

Second, we show that a sudden rise in the local Russian GPR measure has strong adverse effects on the Russian economy, while a sudden rise in any of the non-local GPR measures does not. For instance, in response to an adverse local GPR shock, we find that output drops strongly. In tandem, prices and interest rates rise substantially. In contrast, we find that an anglosphere GPR shock has no significant impact on these variables in Russia. The impact of a local GPR shock is quite widespread and affects several dimensions of the Russian economy. Our findings suggest a fall in asset prices and a rise in volatility on financial markets. Additionally, we observe a strong increase in sovereign risk spreads that go along with a decline in oil prices and a fall in the real effective exchange rate. Again, for an anglosphere GPR shock – but also for a Ukraine GPR shock, or German GPR shock – the effects are more muted or even insignificant.

Third, our results also highlight the role of media perceptions for tracking geopolitical risk. To begin with, the level of our independent media-based GPR measure is higher than the level of the state-controlled media-based GPR measure, pointing towards higher risk perceptions associated with geopolitical developments for the independent media. However, it is the state-controlled news-based GPR shock that has stronger adverse effects on the Russian economy and not the independent media-based GPR shock. This supports the view that state-controlled media emphasize geopolitical risk developments that are important for the state's narratives and decisions, now and in the future.

Finally, we show that GPR shocks are important beyond a sanctions channel. Unsurprisingly, a geopolitical risk shock has a large impact on 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. Still, we find that sanctions matter, for instance, for interest rates and the price level.

**Related Literature.** 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, Conlisk, Iacoviello, and Penn \(2022\)](#) 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 perspective as they are constructed from a set of newspapers from the United States, the United Kingdom and Canada.<sup>1</sup> Our indicator of geopolitical risk for Russia (and also for Ukraine and Germany) instead is based on local media sources. We show that this local measure of geopolitical risk has larger effects on the Russian economy than the anglosphere GPR measure. Additionally, we also develop GPR indicators for Russia that account explicitly for the type of media source (state-controlled vs. independent media) to explicitly control for the limited press freedom.

From a methodological point, our indicators belong to the class of news-based indicators using textual analysis. [Baker, Bloom, and Davis \(2016\)](#) explore this approach to derive an economic uncertainty index. Subsequent research has underlined the relevance of news-based indices as they can improve macroeconomic forecasts ([Thorsrud, 2020](#); [Shapiro, Sudhof, and Wilson, 2022](#); [Kalamara, Turrell, Redl, Kapetanios, and Kapadia, 2022](#)), and help monitor economic activity in real time and at a daily frequency ([Aguilar, Ghirelli, Pacce, and Urtasun, 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. Our study highlights that local news sources provide a better reflection of country-specific geopolitical risk, likely carrying over to other news-based indicators using textual analysis.

Our study also connects to the economic costs of wars and geopolitical conflicts,

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<sup>1</sup>The country-specific indicators are actually based on three newspapers from the United States.

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, Ongena, and Pestova \(2021\)](#), and [Huynh, Hoang, and Ongena \(2022\)](#) among others, disentangle the effect of sanctions on the Russian economy. Another economic dimension for this war is captured in [Antezza, Frank, Frank, Franz, Kharitonov, Kumar, Rebinskaya, and Trebesch \(2022\)](#), 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 using vector autoregression analysis, highlighting the importance of language and the type of media sources that underlies the risk measure. 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 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 the underlying perspective, we denote their seminal indicator as *anglosphere GPR*.

[Table 1](#) summarizes the news sources underlying our local GPR indexes. We chose a set of daily 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, Ghirelli, Molina, Perez, and Muñoz \(2022\)](#). For comparability, we exclude tabloids, local newspapers, as well as weekly newspapers and magazines. 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.<sup>2</sup> For instance, to take into account the specifics of the Slavic languages, we use a dictionary of synonyms. It 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, we consider the word “war” for our translation to 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 sport competitions. Therefore, we exclude these two words and the query contains the initial word for war “война” and only the two relevant synonyms “военные действия” and “боевые действия”.<sup>3</sup> Appendix A shows each country’s search query.

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.<sup>4</sup> Additionally, we also 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.

In addition to the *local GPR* indicators, we replicate the *anglosphere GPR* in-

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<sup>2</sup> See Appendix A.1 for details on the search queries underlying the Russian, Ukrainian and German GPR indexes.

<sup>3</sup>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”).

<sup>4</sup>An overview of independent media sources in Russia can be obtained, for instance, here: <https://like-a.ru/hozyajke-na-zametku-polnyj-spisok-iz-17-a/>.

Table 1: Newspaper sources underlying geopolitical risk indexes

Country	Sources
<b>Anglosphere</b>	Guardian, Daily Telegraph, Financial Times, Globe and Mail, Chicago Tribune, Los Angeles Times, New York Times, USA Today, Wall Street Journal, Washington Post
<b>Russia</b>	<i>State-controlled media</i> Argumenty i Fakty, Argumenty nedeli, Izvestia, Kommersant, Komsomolskaya Pravda, Moskovskii Komsomolets, Parlamentskaya gazeta, Profil, Rossiyskaya Gazeta, Vedomosti <i>Independent media</i> 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)
<b>Ukraine</b>	bigmir.net, Golos Ukrainy, ICTV TV Channel, Interfax, Korrespondent.net, liga.net, Minfin, Obozrevatel, RBC-Ukraine, Ukrainian News ( <a href="http://un.ua/">http://un.ua/</a> ), Ukrinform, Unian
<b>Germany</b>	Frankfurter Allgemeine Zeitung, Süddeutsche Zeitung, Handelsblatt, Die Welt, taz
<b>United Kingdom</b>	Guardian, Daily Telegraph, Financial Times
<b>USA</b>	Chicago Tribune, Los Angeles Times, New York Times, USA Today, Wall Street Journal, Washington Post

indicator using the Factiva database and use the replicated indicator in the economic analysis.<sup>5</sup> This allows us to compare the levels of the different GPR series. The indices by CI are scaled to a mean of 100.

### 3 Geopolitical risk perceptions

This section demonstrates that measures of geopolitical risk are not universal. Instead, they depend critically on the underlying perspective. 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 showcase that the location where geopolitical threats or acts originate is clearly important for how agents perceive the risk associated with such events. Secondly, we draw attention to the importance of the type of media sources that underlie our local GPR indicator.

<sup>5</sup>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 replicate the original GPR index from CI perfectly. However, the two series are almost perfectly correlated; their correlation coefficient is equal to 0.96.

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 Local geopolitical risk

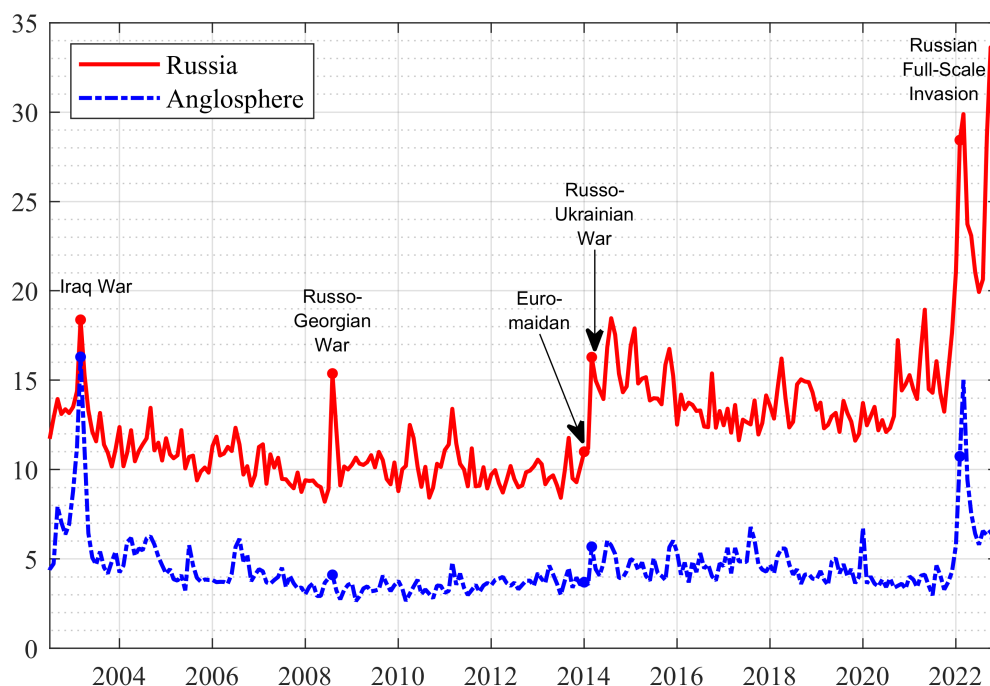


Figure 1: Geopolitical risk: Russian versus anglosphere perception

Figure 1 shows geopolitical risk from the Russian perspective together with the anglosphere GPR index from June 2002 to December 2022. 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 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.<sup>6</sup>

<sup>6</sup>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



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 the Crimea, pointing towards a unique persistent increase of geopolitical risk from a Russian perspective.

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, United States and United Kingdom, together with the anglosphere GPR. The time horizon is from July 2002 until December 2021. Clearly, the series are far from perfectly correlated with each other and with the anglosphere GPR index. In particular, the Ukraine index has even a slight negative correlation. Also the United Kingdom’s and United State’s 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.<sup>7</sup> The reason, of course, is the geopolitical risk shock related to the Russo-Ukraine war.

Table 2: Correlation matrix of country-specific GPR indexes

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

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.

<sup>7</sup>Please see Appendix B for the correlations constructed with data that include 2022.

To emphasize the differences in local perspectives, we 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 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 geopolitical tensions matters greatly for how the associated risk is perceived. 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.

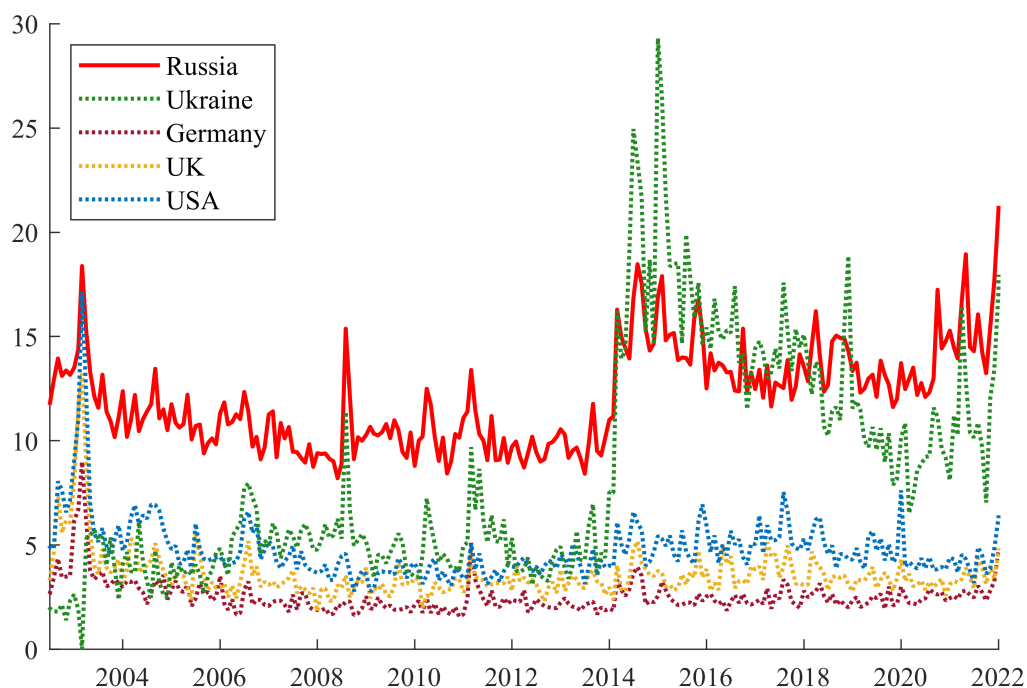


Figure 2: Local geopolitical risk indicators for selected countries

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 for 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.

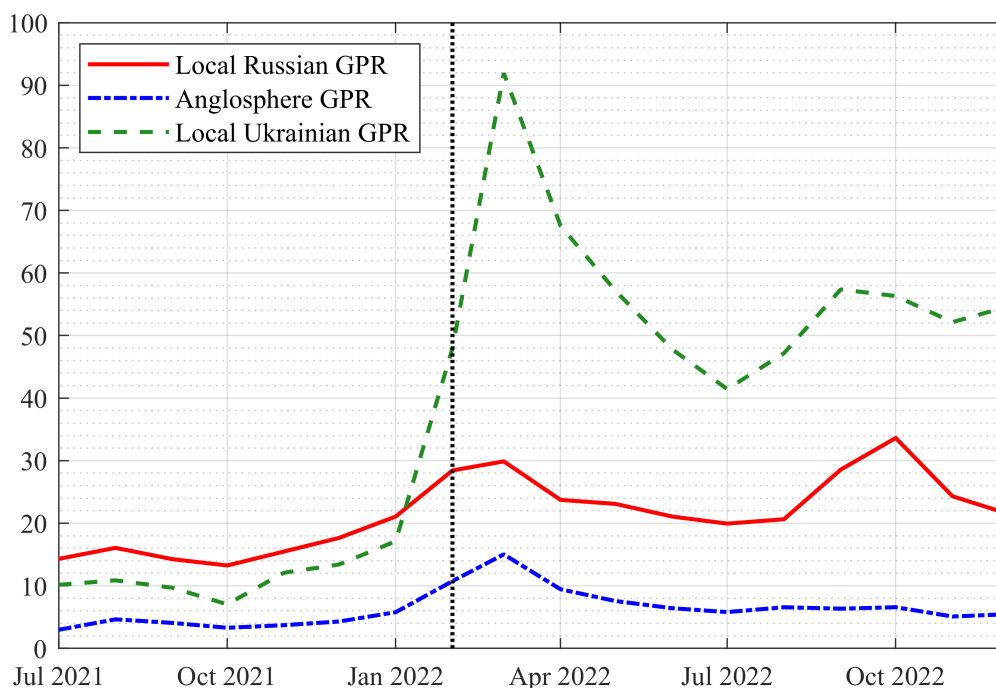


Figure 3: Geopolitical risk perceptions around the Russian full-scale invasion of Ukraine

In the next subsection, 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.

## 3.2 The role of the media

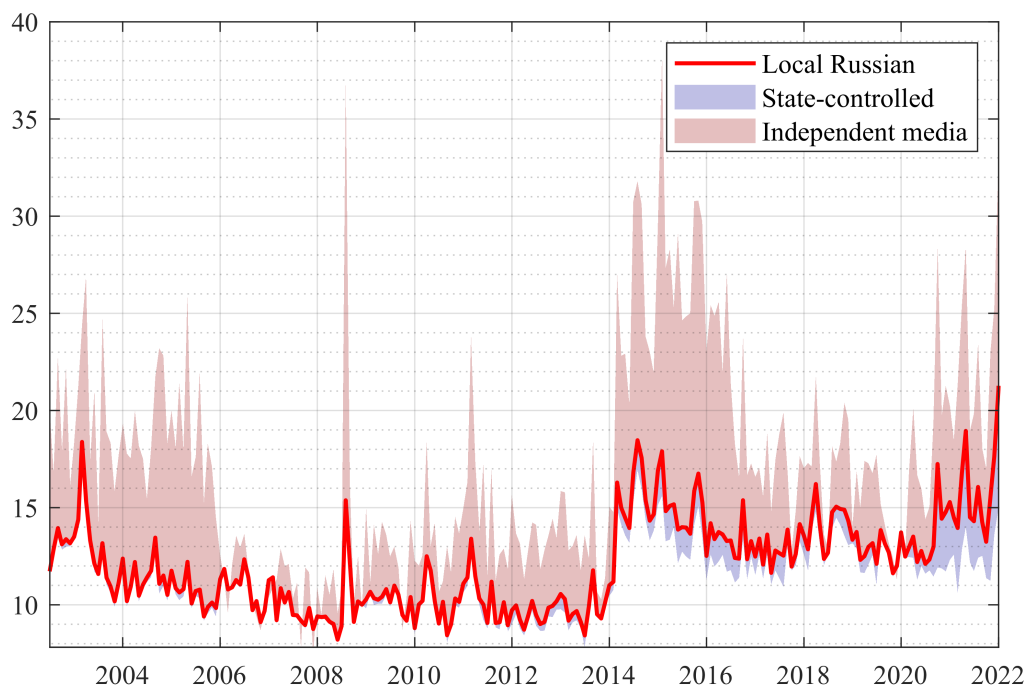


Figure 4: Geopolitical risk: state-controlled versus independent media sources

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. The relative 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 the Crimea.

Overall, the GPR index based on state-controlled news sources is lower than the one computed from independent ones. 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 geo-

litical events. For instance, the war in Georgia or the partial mobilization in Russia in September 2022 show up as important geopolitical threats in both indicators. Interestingly, these two events play only a minor role in the English-speaking world.

## 4 The impact of geopolitical risk shocks on 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.

### 4.1 Data

In this section, we focus on data from 2002M7 until 2021M12. We stop the empirical analysis at the end of 2021 before the start of the Russo-Ukrainian war at the beginning of 2022 for three reasons. First, the war brought an increase in measures against the independent media in Russia. Clearly, fewer media sources, but also restricted reporting, could bias the results for the independent news media GPR and distort the comparison with the other GPR indices. Second, in response to the war, a series of sanctions were implemented targeting the Russian economy. This could as well bias the analysis of geopolitical risk, since a rise in GPR is likely positively correlated with a rise in sanction measures at that time. Third, it is not clear whether and in which way Russian data is subject to misreporting after the start of the war.

Next to our constructed 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, which are 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 volumes, 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 RTS index. Total credit volumes reflect 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, which may help to differentiate the impact of local and non-local GPR shocks. 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 monthly frequency by interpolation with a cubic spline. Please see Appendix C 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  $t = 1, \dots, T$ ,  $C$  a vector of constants,  $\mathcal{A}_0$  and  $\mathcal{A}_l$  coefficient matrices of size  $n \times n$ , and  $\varepsilon_t$  an  $n \times 1$  vector of exogenous structural shocks.  $p$  denotes the lag length. The BSVAR model can be written as

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

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

Following CI, we identify a GPR shock by assuming an upper triangular structure of  $A_0$  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, conclusions remain the same. Please see Appendix E 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. In tandem, we also adapt the prior, such that the tightness of beliefs around the random walk prior are relaxed for all variables.<sup>8</sup> 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 size of one standard deviation. Specifically, we consider the impact of a shock that leads to a rise on the respective GPR index.

**Local GPR shock.** 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.

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<sup>8</sup> 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, Schüler, and Zhang \(2022\)](#)). 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  $\lambda_1$  (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.

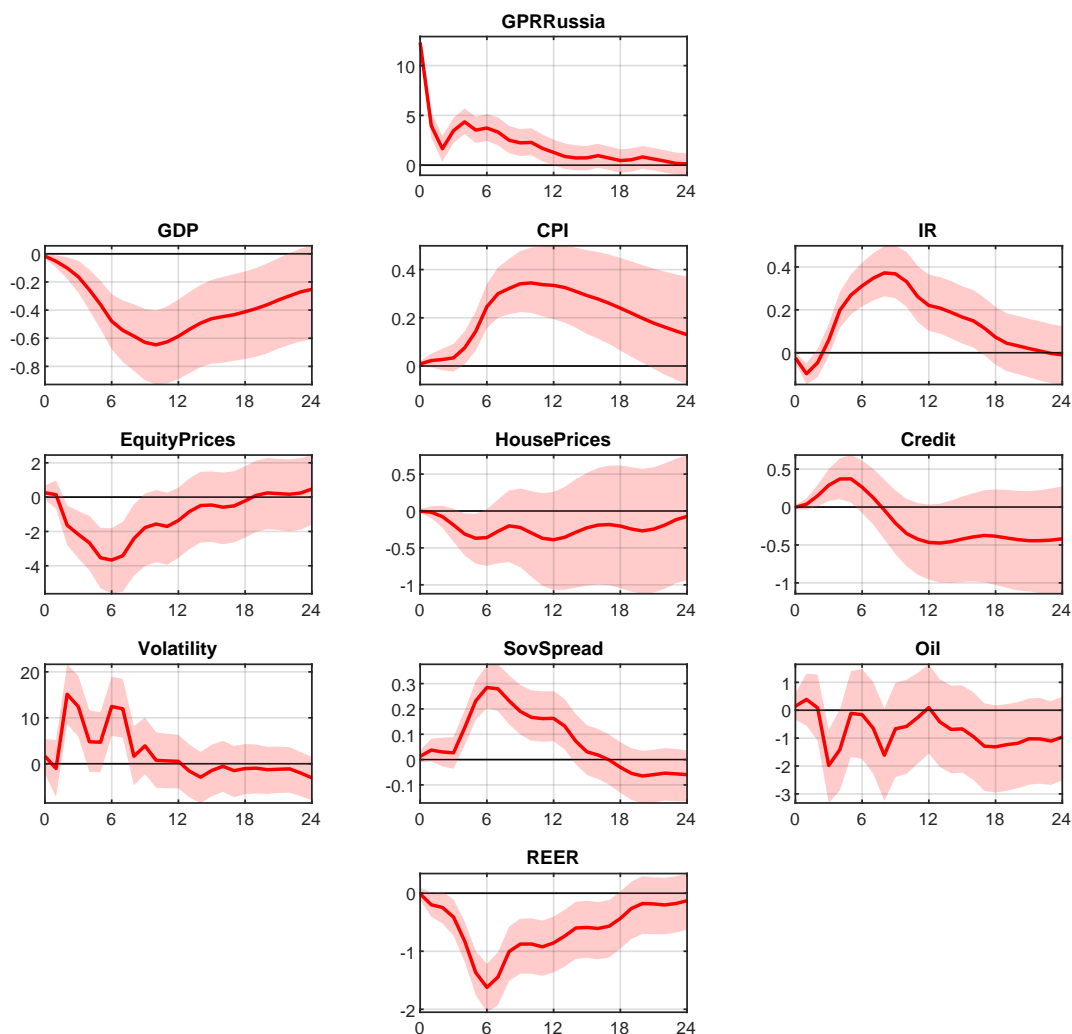


Figure 5: Impact of Russian GPR shock on Russian economy

*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.

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 rates 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.

**Local versus anglosphere GPR shock.** 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 marginally more strongly. Therefore, our results suggest that it is local GPR shocks that matter, especially for the real economy. This underlines the importance of relying on local perspectives when assessing the consequences of geopolitical risk for different countries.

We also consider the GPR indices from a Ukrainian and German perspective. 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 D. 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

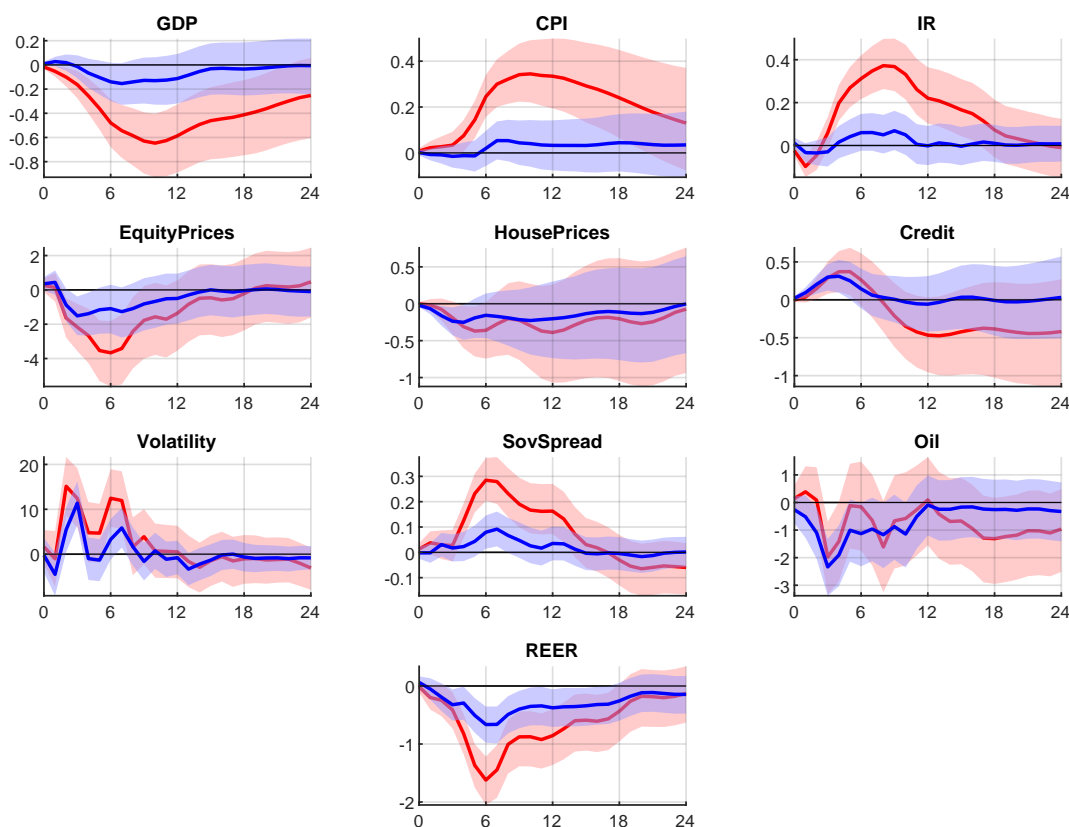


Figure 6: Impact of Russian GPR shock (red) and anglosphere GPR shock (blue) on Russian economy

*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.

media (red, see Figure 7) versus the independent media one (blue).

Unsurprisingly, the impact of a shock identified with the 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 up to 0.78%, while 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

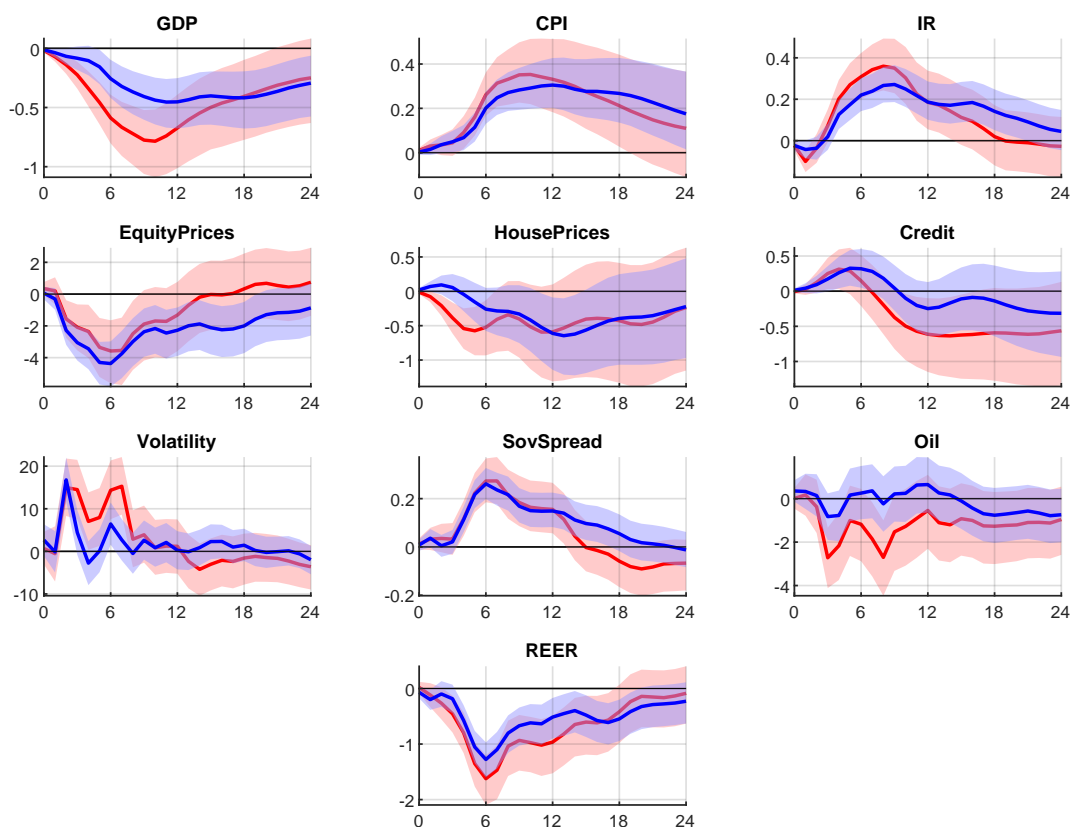


Figure 7: Impact of Russian state-controlled (red) and Russian independent (blue) media GPR shock on Russian economy

*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.

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 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 especially 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 assess the forecast error variance decomposition in this section (see Figure 6). 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 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 of course is directly affected by Russia's GPR perceptions, 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, the importance of GPR shocks is still subdued, for instance, for output and prices. Taken together, accounting for local geopolitical

risk perceptions is important to obtain an accurate picture of its impact on the economy.

Table 3: Importance of GPR shocks for economic fluctuations in Russia

GPR index :	Russia	-State	-Indep.	Anglos.	Ukraine	Germany
GDP	12	17	6	1	4	1
CPI	10	11	9	0	5	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	11	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 shocks to our broad Russia GPR index, or the 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 the sanctions channel

Now, we focus on the role of sanctions for the transmission of geopolitical risk. Sanctions are often imposed in response to geopolitical threats and 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.

#### 4.5.1 Construction of the 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. Specifically, 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 incorporating the 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, different to 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.<sup>9</sup>

In addition to accounting for the local perspective, our approach abstracts from the costs of the imposing country. If we were to use anglosphere media sources, the amount 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, Goldbach, and Nitsch, 2021](#)).

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<sup>9</sup>Appendix [F](#) provides the search query in English and its translated version.

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 that 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.

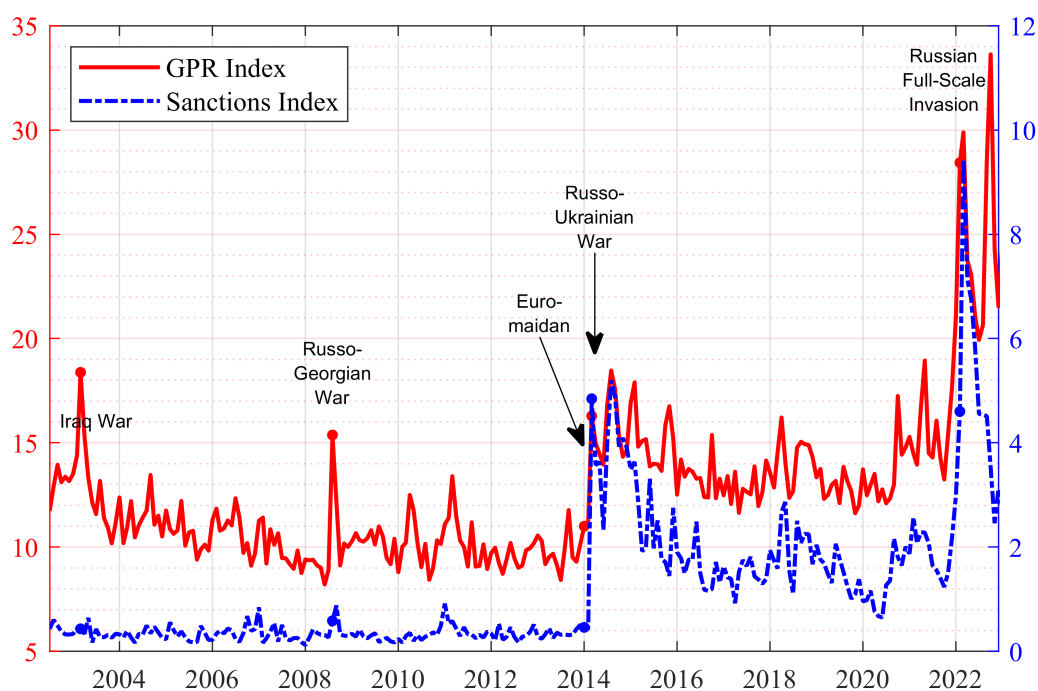


Figure 8: Geopolitical risk indicator and sanctions intensity indicator

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 implemented against 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 a quite 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. From a more general point, an evaluation 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 using Russia as a case study.

#### **4.5.2 Geopolitical risk shocks, the sanctions channel, and a counterfactual experiment**

In this section, we turn to our dynamic analysis to learn about the role of sanctions for the transmission of geopolitical risk shocks. To do so, we include the sanctions intensity variable in our Bayesian VAR model.

We order the sanctions index in the second positions, directly behind the geopolitical risk measure. This pecking order captures the fact that sanctions respond contemporaneously to geopolitical risk shocks. Thus, this ordering allows for the possibility that sender countries may impose sanctions in response to geopolitical risk threats and 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 compared 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 in response. 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. Specifically, we aim to 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).<sup>10</sup> 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  $\hat{A}_i, \forall i = 1, \dots, 12$ . Formally, we adjust the estimated matrices ex-post as follows as:

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

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

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<sup>10</sup>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  $C$ .

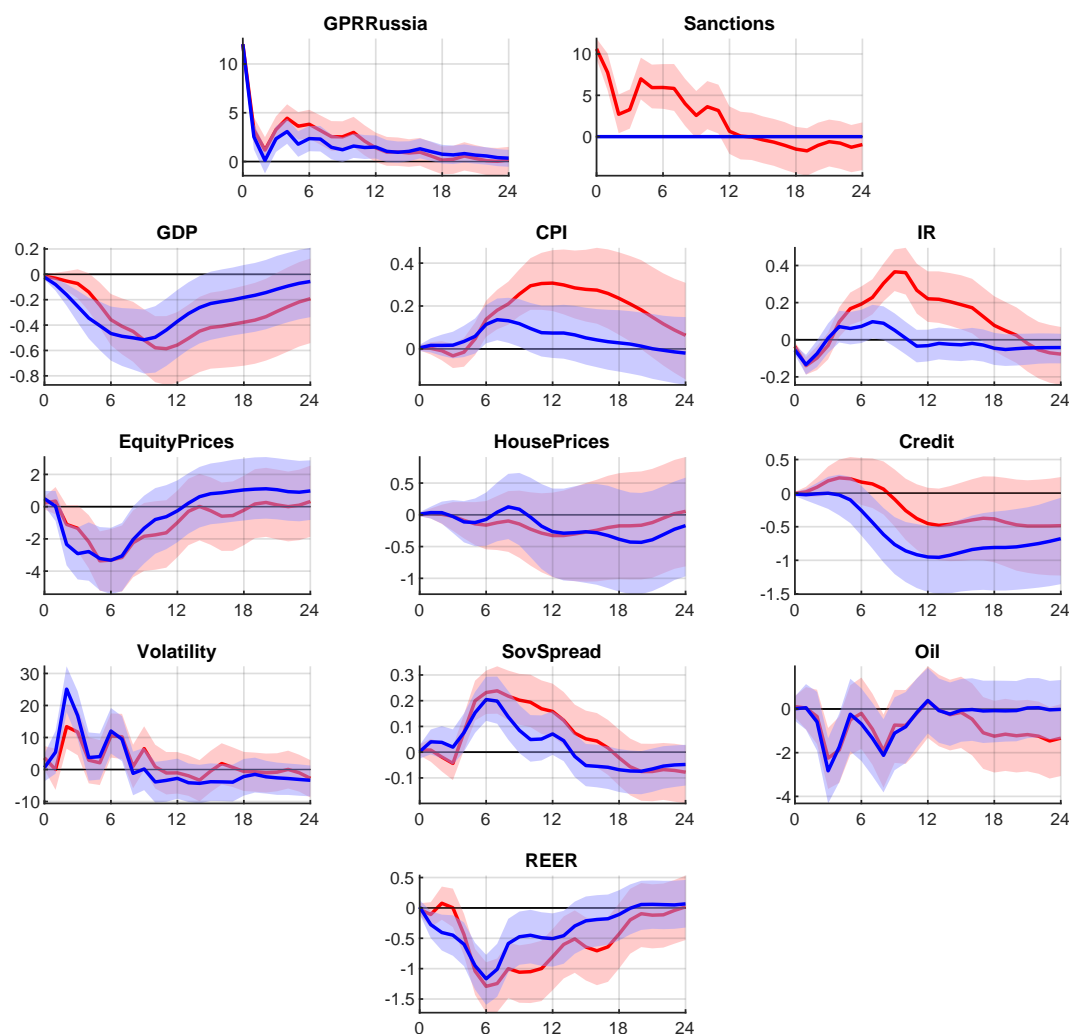


Figure 9: Impact of Russian GPR shock with sanctions channel: Active (red) vs. non-active (blue)

*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.

that the strategy is not robust 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 however then, in turn, prolong geopolitical

risk. Or, put differently, without sanctions geopolitical risk would resolve more quickly.

Furthermore, we observe that a geopolitical risk shock still contracts the economy even in the absence of the sanctions channel, albeit 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, interest rates barely move without the sanctions channel. In line with this observation, the impact on the price level is weaker as well. 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. Finally, credit is an interesting case. Credit volumes only reduce in the counterfactual scenario without sanctions.

Overall, the results suggest that the sanctions channel is important for the transmission of geopolitical risk shocks in Russia. 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 similarly substantial.

## 5 Conclusion

Tracking geopolitical risk is important for governments, central banks, firms, and investors, among others. In this paper, we highlight that information about geopolitical risk is reported in different ways, depending on the location and type of newspaper source. We do so by extending the seminal work by CI and construct local news-based measures of geopolitical risk.

Our study suggests that taking local GPR perceptions into account is important. First, we show that a Russian GPR measure relates to key events in Russia and differs to other non-local GPR indexes. Second, our findings suggest that it is local GPR perceptions that matter. A sudden rise in the local Russian GPR measure has strong adverse effects on the Russian economy, while a sudden rise in any of the non-local GPR measures does not. Third, we find that Russian geopolitical risk perceptions vary across state-controlled and independent media. Finally, the GPR shocks are important beyond a sanctions channel.

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## A Geopolitical risk measurement

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 4.

Table 4: Adaptation of the search query to Factiva database

Search query in <a href="#">Caldara and Iacoviello (2022)</a>	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 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 геополитическ\*) 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 геополитическ\*) near2 (начин\* OR начал\* OR вспых\* OR объявл\* OR провозгл\*)) OR ((союзник\* OR враг\* OR враж\* OR противник\* OR арми\* OR «вооружени\* 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 the same methodology, we calculated the Ukrainian GPR index. Since Ukraine has historically developed a wide use of the Russian language in everyday 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:** ((войн\* OR воен\* OR боев\* OR столкновени\* OR противостояни\* OR конфронтаци\* OR конфликт OR революци\* OR переворот OR восстани\* OR геополитическ\* 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 санкции\* 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

геополитическ\* 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 воен\* 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 тривога\* OR напруж\*)) OR ((мир\* OR перемир\* OR мирн\* OR «припинен\* воен\* 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 ((воен\* OR бойов\* OR військ\* OR армі\* OR «збройн\* сил\*» OR ракет\* OR збро\* OR снаряд\* OR війн\* OR танк\* OR бомб\* OR боеголовк\*) AND (нарошув\* OR зосередж\* OR розшир\* OR ізоляц\* OR санкці\* OR ембарго OR заборон\* OR ультиматум OR мобіліз\* OR наступ)) AND ((ядерн\* OR атомн\* OR «ядерн\* збро\*» OR «атомн\* збро\*» OR «ядерн\* боеголовк\*» 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 тривога\* 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 тривога\* OR напруж\*)) OR ((війн\* OR воен\* 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 музыка)).

**Search query for counting the total number of articles for Ukraine:** ("и" AND "в" AND "не" AND "что" AND "это" AND "а") OR ("i" AND "в" AND "не" AND "що" AND "це" AND "а").

## 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 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 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 Ge-fahr\* 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 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 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 Correlation among GPR measures, including 2022

Table 5: Correlation matrix of country-specific GPR indexes

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

## C 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@EMERGE CW)
- 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@EMERGE CW,922))
- real effective exchange rate (C922EIRC@IFS)

## D BSVAR results for Ukraine and Germany

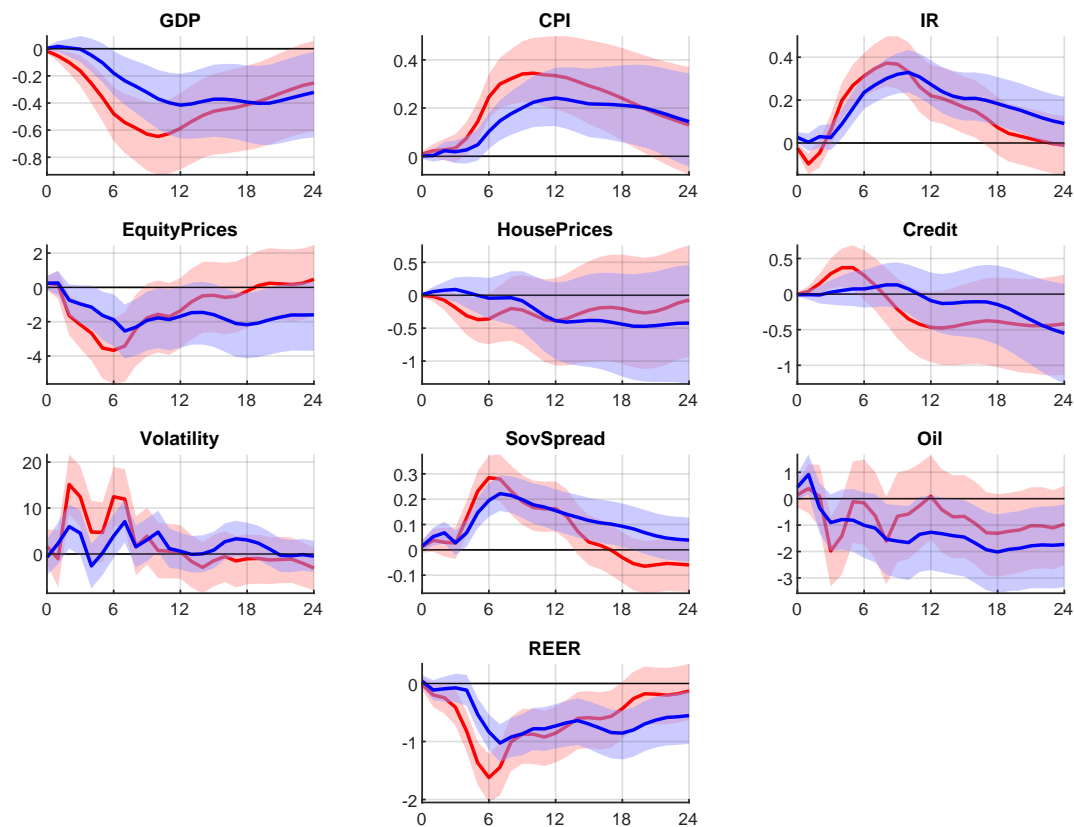


Figure 10: Impact of Russia (red) and Ukraine (blue) GPR shock on Russian economy

*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.

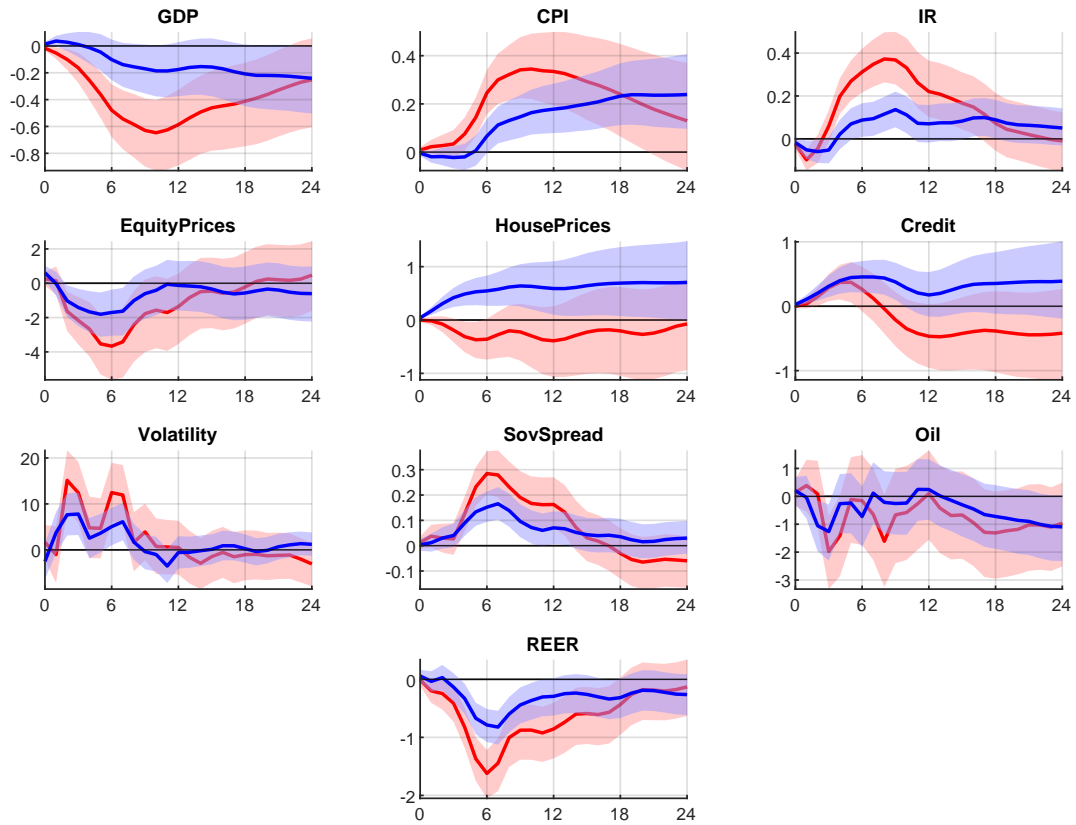


Figure 11: Impact of Russia (red) and Germany (blue) GPR shock on Russian economy

*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.

## E Robustness BSVAR results: No contemporaneous impact

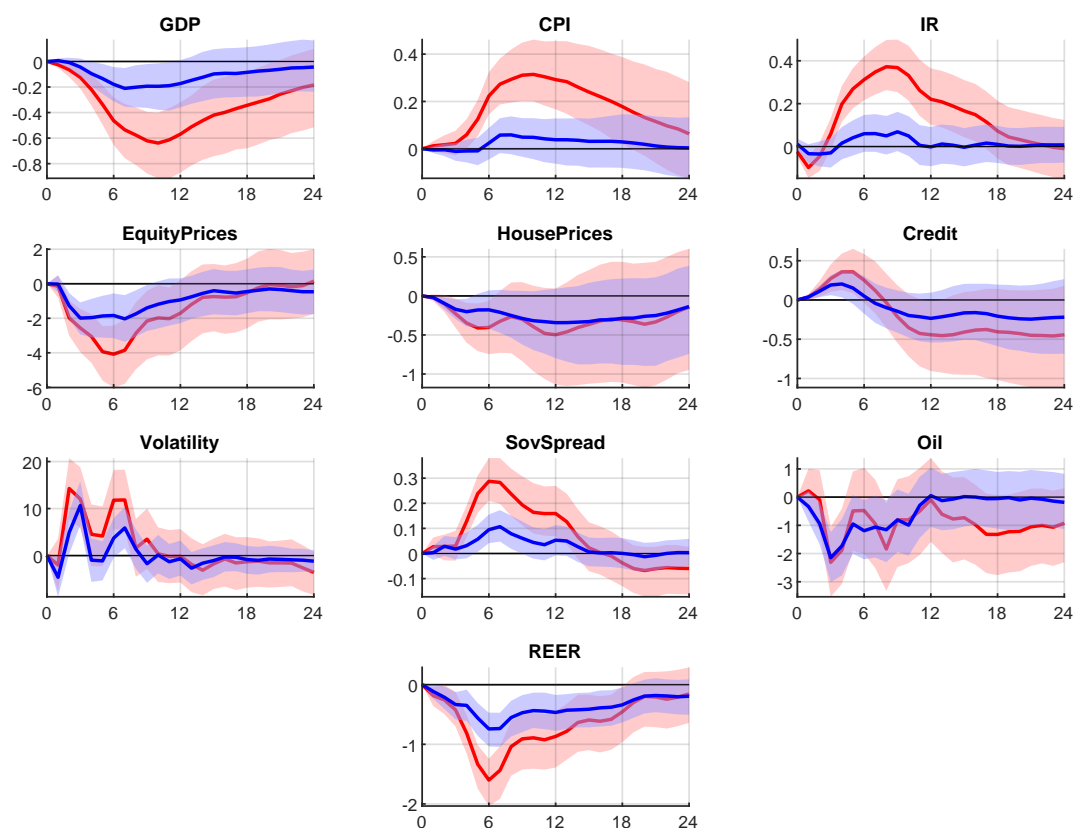


Figure 12: No contemporaneous impact: Russia GPR shock (red) and anglosphere GPR shock (blue) on Russian economy

*Notes:* Figure shows the 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.



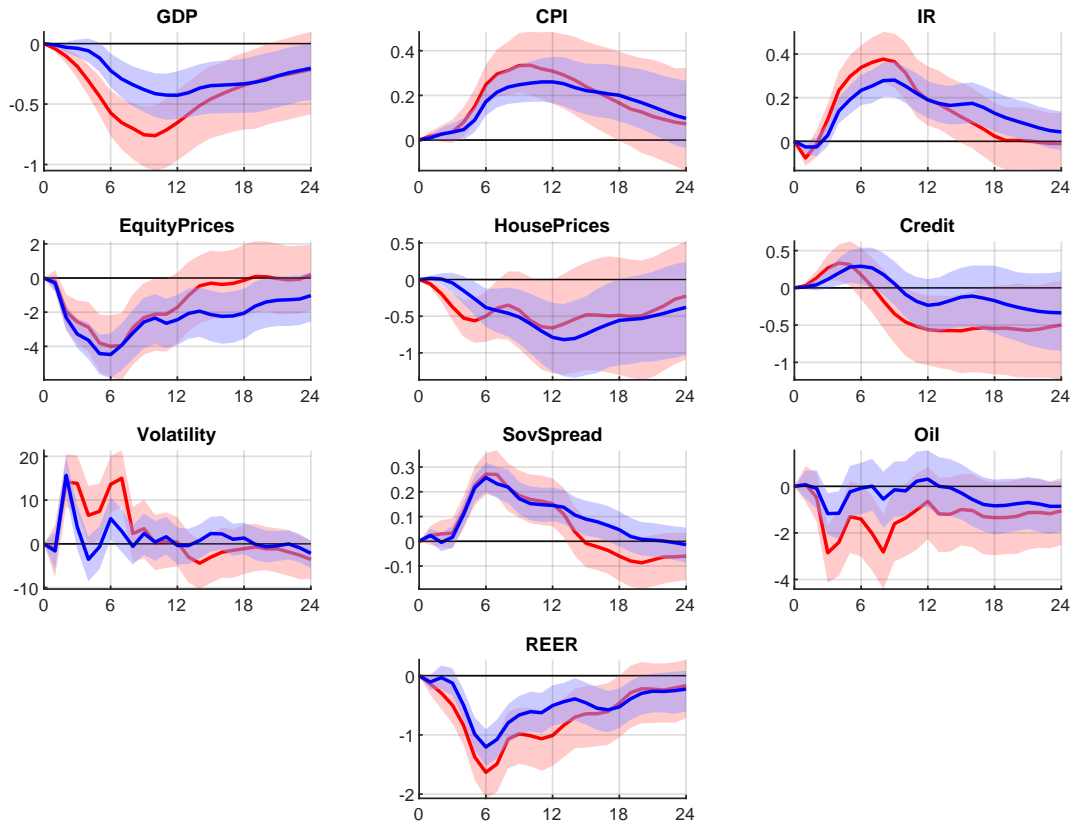


Figure 13: No contemporaneous impact: State-controlled (red) and independent (blue) media GPR shock on Russian economy

*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.

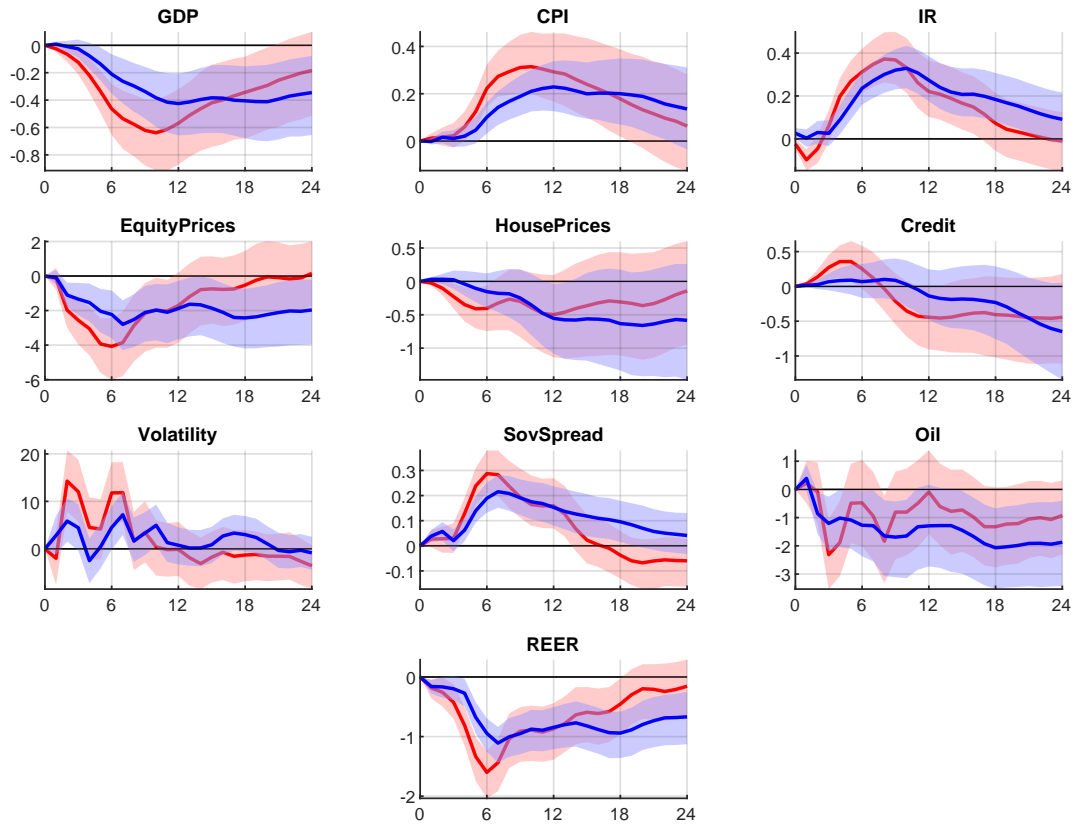


Figure 14: No contemporaneous impact: Russia (red) and Ukraine (blue) GPR shock on Russian economy

*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.

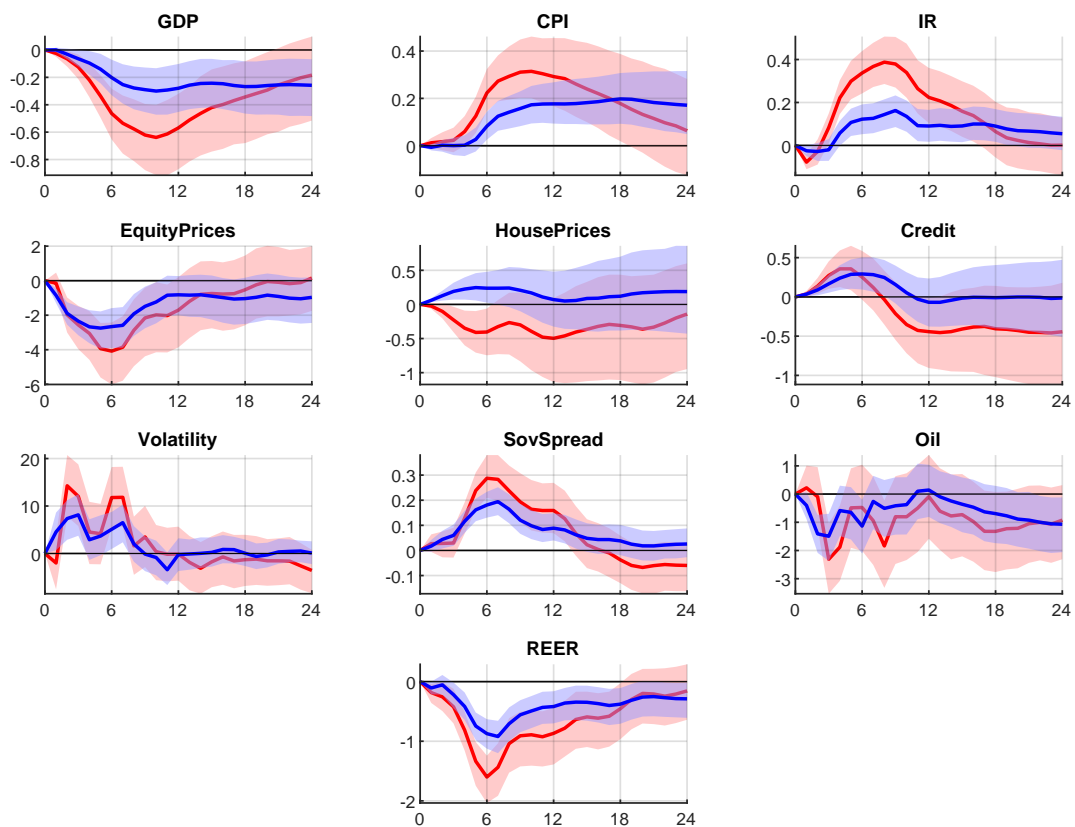


Figure 15: No contemporaneous impact: Russia (red) and Germany (blue) GPR shock on Russian economy

*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 6: 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	5	3
CPI	8	9	6	0	5	3
IR	19	17	12	1	12	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	11	7
Oil	2	5	1	2	3	1
REER	18	19	10	2	11	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.

## F Russian sanctions index

**Search query in Russian for sanctions index:** эконом \* AND санкци \* AND (против OR в отношении) AND Росси\* NOT (Сири\* OR Иран\* OR (Северн\* near1 Коре\*) OR Венесуэлл\*)

**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)