Impact of Heightened Uncertainty from the Russia–Ukraine War on Economic Activity*

Žymantas Budrys[†1,2] and Soroosh Soofi Siavash[‡1,2]

[1]Lietuvos bankas
[2]Vilnius University

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Abstract

The war in Ukraine sharply increased geopolitical risk and energy prices in Europe. We investigate its effects on real activity and inflation across 21 European countries, asking whether eastern economies were more affected than western ones. Using a Bayesian panel VAR with structural shocks identified through heteroskedasticity, we construct a "no-war" counterfactual in which geopolitical uncertainty shocks do not occur in 2022Q1 and oil prices follow the futures path implied in December 2021. We find that geopolitical uncertainty persistently reduces real activity and lowers inflation, with larger effects on activity in eastern European economies. Higher energy prices also reduce activity in nearly every country and contribute substantially to the inflation surge in 2022. Together, these effects imply considerably stronger GDP growth under the counterfactual, especially in countries closer to the conflict.

Keywords: geopolitical risk, uncertainty, energy prices, Russia–Ukraine war, panel VAR, counterfactual analysis.
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[†]Email: zbudrys@lb.lt
[‡]Email: ssoofi@lb.lt

1 Introduction

The war in Ukraine has posed significant challenges to European economies. In this paper, we examine how these economies have been affected and how the effects differ for countries closer to the conflict. The analysis relies not only on distinguishing between the multiple shocks triggered at the onset of the war, but also on capturing their heterogeneous impacts across countries. On the one hand, the war raised geopolitical uncertainty about the future economic outlook, especially in close proximity to the conflict. On the other hand, it caused large disruptions in energy markets, which drove up prices and added to the inflationary pressures during Europe's recent surge. In this paper we distinguish between these two channels and study their implications for 21 European economies.

The starting point of the analysis is a Bayesian panel vector autoregression (VAR) that combines the geopolitical risk index for Russia of Caldara and Iacoviello (2022) with prominent macroeconomic aggregates of 21 European countries. The model allows for cross-country heterogeneity while leveraging panel information to improve estimation efficiency. Geopolitical uncertainty shocks are identified through heteroskedasticity, exploiting time variation in the volatility of the structural shocks as a source of identifying information. We then use the estimated model for a counterfactual exercise that separates the uncertainty and energy-price channels of the war. In particular, we evaluate how real activity and inflation in European economies would have evolved if the geopolitical uncertainty shocks of early 2022 had not occurred and energy prices would have followed the path implied by the futures curve before the war.

Nothing in our identification requires the geopolitical uncertainty shock to move real activity and inflation in the same direction across countries. Yet when we identify the shock through heteroskedasticity, we find that it lowers both in nearly every economy we consider. The shock's estimated volatility rises around the major geopolitical episodes of the sample, most sharply in 2014 and at the onset of the war in 2022, and it accounts for most of the forecast error variance of the GPR index within a month. On impact, the shock lowers economic sentiment and equity prices. Real GDP and industrial production decrease only slightly at first, then decline gradually and remain depressed for a prolonged period. HICP inflation, in turn, drops as well. These dynamics closely resemble the responses to an adverse demand shock reported in the broader uncertainty literature.[1]

Higher energy prices in early 2022 had different effects. They were also followed by lower real economic activity, but significantly higher inflation. Thus, geopolitical uncertainty and energy prices both contributed to lower real growth after the onset of the war, but had different effects on inflation: geopolitical uncertainty lowered inflation, whereas energy prices contributed substantially to Europe's inflation surge in 2022.

[1] See, for example, Bloom (2009), Leduc and Liu (2016), and Basu and Bundick (2017).

Importantly, these effects vary substantially across countries. The decline in real GDP attributed to geopolitical uncertainty tends to be larger in countries closer to the conflict. The energy-price contribution also varies considerably, but shows a less clear relationship with proximity to the war, potentially reflecting differences in energy mix and industrial composition. To further investigate this heterogeneity, we also compare the GDP paths of countries with that of the 21-country aggregate. We document that some countries with large initial losses, such as Lithuania and Poland, subsequently grew strongly, while others, including Latvia, Estonia, Hungary, and Finland, remained below the EU-21 path.

We subject our findings to a host of robustness checks. We impose an additional narrative sign restriction, replace the Russian GPR index with the Ukrainian index, and treat the two indexes as noisy measures of a common geopolitical risk factor. Given the sharp movements in natural gas prices around the onset of the war, we also examine whether our results are sensitive to extending the counterfactual conditions to account for gas prices. We consider specifications that include gas prices separately or combine oil and gas prices into a synthetic energy index. The main cross-country patterns remain similar across these specifications.

Our paper is related to four strands of the literature. The first documents that the economic effects of war extend beyond the countries directly involved and tend to be larger for economies that are closer to the conflict or have higher exposure through trade linkages (Murdoch and Sandler, 2004; Glick and Taylor, 2010; Qureshi, 2013; Federle, Meier, Müller, and Sehn, 2026; Federle, Meier, Müller, Mutschler, et al., 2026; European Commission, 2025). A second strand develops newspaper-based measures of geopolitical risk and traces their macroeconomic effects, without investigating how these effects vary with countries' proximity to the conflict (Caldara and Iacoviello, 2022; Bondarenko et al., 2026; Caldara, Conlisk, et al., 2026). We contribute to these two strands by combining the Russia-specific GPR index of Caldara and Iacoviello (2022) with a panel of 21 European economies to quantify how the effects of geopolitical uncertainty and energy-price movements in 2022 compare across Eastern and Western Europe.

A third strand employs structural VARs to study geopolitical uncertainty shocks. A common approach identifies these shocks as innovations to a GPR index. Recent work emphasizes, however, that the same increase in the index can reflect different underlying disturbances. Pinchetti (2026) distinguishes between geopolitical energy shocks, which raise inflation and lower activity, and broader geopolitical shocks unrelated to energy markets, which lower both inflation and activity. Verduzco-Bustos and Zanetti (2026) identify geopolitical oil-price shocks and show that they have properties akin to severe oil-supply shocks. Moreover, Brignone et al. (2026) find that the transmission of geopolitical risk depends on the size of the shock with large shocks amplifying uncertainty and lowering economic activity, while their effect on inflation remains muted, as weaker demand offsets upward pressure on prices. In line with this literature, we use a structural VAR method adapted to panel data and construct a counterfactual that removes two war-related components. The first is a geopolitical uncertainty shock, identified through

heteroskedasticity. The second is the unexpected increase in energy prices, which we remove by conditioning Brent oil prices on the futures curve observed before the war. Consistent with the distinction drawn in this literature, we find that geopolitical uncertainty shocks lower both real activity and inflation, whereas the energy-price channel lowers activity but raises inflation.

Finally, a fourth strand studies the role of energy prices in the recent inflation surge in Europe. The emerging picture is that the energy-price shocks of 2021–22 persistently raised consumer prices and reduced economic activity (Neri, 2025; Alessandri and Gazzani, 2025), while their transmission differed markedly across euro-area countries (Baumeister, 2023). Consistent with this evidence, we find that energy-price shocks contributed substantially to the recent rise in inflation across Europe, but that their contribution varies considerably across countries and, unlike uncertainty-related losses in real activity, bears a less clear relation to proximity to the war.

The remainder of this paper is organized as follows. Section 2 documents the evolution of geopolitical risk, energy prices, and macroeconomic activity after the start of the war. Section 3 presents the panel VAR and the methodology used to identify the shocks, and Section 4 describes the data. Section 5 reports the effects of geopolitical uncertainty shocks and the counterfactual results for real activity and inflation. Section 6 compares the subsequent performance of the countries hit hardest with that of the EU aggregate. Section 7 presents robustness checks, and Section 8 concludes.

2 Geopolitical risk, energy costs, and macroeconomic developments following Russia's invasion of Ukraine

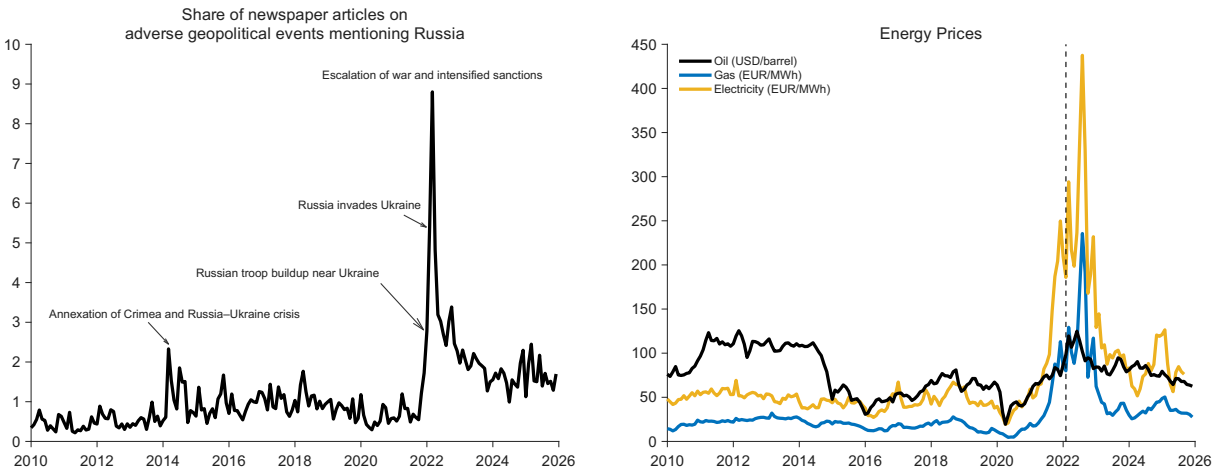
Russia's full-scale invasion of Ukraine was accompanied by two particularly visible economic developments: a sharp increase in geopolitical risk and severe disruption in global energy markets. Figure 1 documents these developments. The left-hand panel presents the geopolitical risk (GPR) index for Russia developed by Caldara and Iacoviello (2022), while the right-hand panel shows the evolution of selected energy price indices.

Geopolitical risk began to rise during the buildup of Russian military forces near Ukraine in late 2021 and early 2022. It increased sharply following the full-scale invasion in February 2022 and the subsequent escalation of the war and international sanctions. Although the index declined from its initial peak, it remained above its pre-invasion level through 2025. The index, therefore, captures the invasion and the recurrent geopolitical uncertainty that followed the war's course.

The invasion was also followed by a pronounced increase in energy prices. As shown in the right-hand panel, both the magnitude and the persistence of this increase differed across energy markets. These differences may reflect variation in dependence on Russian supply, market structures, storage capacity, and the ability to substitute across energy sources. Taken together,

the two panels illustrate the close timing of heightened geopolitical risk and energy-market disruption. This descriptive correspondence, however, does not establish a causal relationship between the two developments or identify their respective macroeconomic effects.

Figure 1: Geopolitical Risk and Energy Prices



Notes: The left-hand panel shows the Geopolitical Risk Index for Russia developed by Caldara and Iacoviello (2022), with selected episodes of heightened geopolitical tension annotated. The right-hand panel shows selected energy price series: the Brent crude oil spot closing price, the Netherlands TTF day-ahead natural gas forward midpoint price, and the average electricity price across France, Germany, Italy, the Netherlands, and Spain.

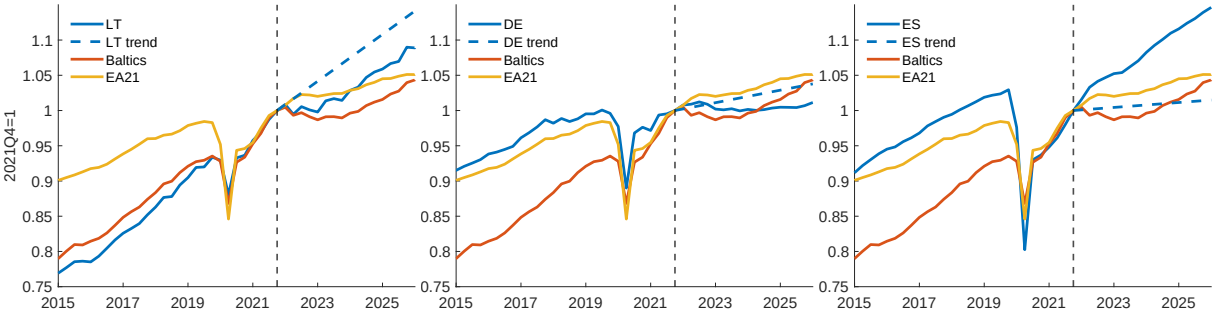
The same period was characterized by a weakening of economic activity relative to pre-war trends for some countries. Figure 2 compares the observed paths with linear trends extrapolated from their pre-invasion growth for Lithuania, Germany and Spain. For Lithuania and Germany, the observed series fell below these benchmarks after the outbreak of the war. The size and persistence of these deviations, however, differed considerably across countries.

This heterogeneity is economically important. Some economies, including Lithuania, appear to have remained closer to their pre-war trajectories than others, despite their geographical proximity and exposure to the conflict. Such differences suggest that the macroeconomic consequences of the war cannot be summarized by a single common response. They may instead depend on countries' energy dependence, trade exposure, economic structure, policy responses, and capacity to adjust to external shocks.

These descriptive patterns raise two central questions. First, to what extent can the post-invasion deterioration in economic activity be attributed to war-related shocks rather than to other structural forces? Second, why did the magnitude and persistence of the economic effects differ across countries?

Answering these questions is challenging because wars affect economic activity through multiple, interconnected channels, including uncertainty, energy-supply disruptions, sanctions, trade reorientation, financial conditions, and changes in household and firm expectations. Moreover, several of these mechanisms operate simultaneously and may reinforce one another. Simple

Figure 2: GDP development relative to pre-war trend



Notes: The figure shows the observed paths of GDP in Lithuania, Germany, Spain relative to linear trends estimated using pre-war data. Each series is normalized to its 2021Q4 value. The "Baltics" aggregate is calculated as a GDP-weighted average of the three Baltic countries. The linear trend is calculated over 2015q1-2021q4 sample.

comparisons of macroeconomic outcomes before and after the invasion, therefore, cannot isolate the contribution of any individual channel.

To address this identification problem, we employ a structural vector autoregression. The framework uses historical relationships among the variables to identify economically interpretable structural shocks, trace their dynamic transmission, and quantify their contributions to macroeconomic developments during the war. Our analysis focuses on geopolitical risk and energy prices because they constitute two of the most immediate and observable aggregate channels through which Russia's invasion may have affected European economies.

3 Empirical framework

We estimate a heterogeneous panel structural vector autoregression (SVAR) with stochastic volatility. For each country $i = 1, \ldots, N$, the model is

$$x_{i,t} = c_i + \sum_{\ell=1}^{p} B_{i,\ell} x_{i,t-\ell} + A_{0,i}^{-1} \Lambda_{i,t} \varepsilon_{i,t}, \qquad \varepsilon_{i,t} \sim \mathcal{N}\left(0_{k\times 1}, I_k\right), \tag{1}$$

where $x_{i,t}$ is a $k \times 1$ vector of endogenous variables, c_i is a $k \times 1$ vector of intercepts, and $B_{i,\ell}$ is a $k \times k$ matrix of coefficients at lag ℓ. The nonsingular matrix $A_{0,i}$ describes contemporaneous relationships among the variables, while $\Lambda_{i,t}$ is a diagonal matrix containing the time-varying standard deviations of the structural shocks. p stands for the number of lags, which we set to the value of five.

The parameters c_i, $B_{i,\ell}$, and $A_{0,i}$ are allowed to differ across countries. The model therefore accommodates cross-country heterogeneity in macroeconomic dynamics and in the transmission of structural shocks. At the same time, a hierarchical prior as in a panel setting allows information to be shared across countries and limits overfitting in relatively short country-specific samples.

We employ Bayesian estimation for two main reasons. First, the available time series for euro-

area countries are relatively short compared with the number of parameters in the model. Second, several macroeconomic series—particularly for smaller EU economies—are volatile, making country-specific parameters difficult to estimate precisely. Bayesian regularization helps constrain the parameters to economically plausible ranges, while the hierarchical structure allows countries with less informative data to borrow information from the rest of the panel, following Jarociński (2010).

3.1 Hierarchical panel set-up

To describe the hierarchical prior, let

$$B_i = [c_i, B_{i,1}, \ldots, B_{i,p}] \tag{2}$$

denote the $k \times (1 + kp)$ matrix of intercept and lag coefficients, and let $\beta_{i,o,r}$ denote element at (o, r). We write

$$A_{0,i} = \begin{bmatrix} \alpha_{i,1}' \\ \vdots \\ \alpha_{i,k}' \end{bmatrix}, \tag{3}$$

where $\alpha_{i,o}$ contains the contemporaneous coefficients in equation o.

Conditional on the common coefficients and the group-specific variance parameters, country-specific coefficients are assumed to be independent. Let $g(o, r) \in \{\text{own}, \text{cross}, \text{int}\}$ indicate whether coefficient r in equation o is an own-lag coefficient, a cross-variable lag coefficient, or an intercept. We specify

$$\beta_{i,o,r} \mid \bar{\beta}_{o,r}, \kappa_{g(r)} \sim \mathcal{N}\left(\bar{\beta}_{o,r}, C_{i,o,r}\kappa_{g(r)}\right), \tag{4}$$

where $C_{i,o,r}$ is the predetermined Minnesota-type scaling term:

$$C_{i,o,r} = \begin{cases} \dfrac{1}{\ell^2}, & \text{for the } \ell\text{-th own lag,} \\ \dfrac{s_{i,o}^2}{\ell^2 s_{i,r}^2}, & \text{for the } \ell\text{-th lag of variable } r \neq o, \\ s_{i,o}^2, & \text{for the intercept,} \end{cases} \tag{5}$$

where $s_{i,o}$ is the sample variance of residuals from an AR(p) model for the variable i. κ_{own}, κ_{cross}, and κ_{int} control the degree of cross-country dispersion within the respective coefficient groups. Smaller values of κ_g imply stronger pooling of country-specific coefficients toward their

common counterparts. We place the following hierarchical prior on each group-specific variance:

$$\kappa_g \mid z_g \sim \mathcal{IG}\left(\ell_0, z_g\right), \qquad z_g \sim \mathcal{G}\left(a_0, b_0\right), \qquad g \in \{\text{own}, \text{cross}, \text{int}\}, \tag{6}$$

where the gamma distribution is parameterised in terms of its shape and rate, we set $\ell_0 = 3.5$, $a_0 = 1.5$, $b_0 = 1$. This hierarchical prior supports values arbitrarily close to zero, thereby allowing strong pooling, while retaining sufficient right-tail mass to accommodate substantial cross-country heterogeneity.[2]

The group variances, κ_g, are estimated jointly with the remaining model parameters. The prior, therefore, allows the data to determine the appropriate degree of pooling separately for own-lag coefficients, cross-variable lag coefficients, and intercepts.

For the elements of the contemporaneous matrix, we use the hierarchical prior

$$\alpha_{i,o,r} \mid \bar{\alpha}_{o,r}, \tau_{A,o} \sim \mathcal{N}\left(\bar{\alpha}_{o,r}, \frac{\tau_{A,o}}{\bar{s}_{i,r}}\right), \tag{7}$$

where $\bar{\alpha}_{o,r}$ is the corresponding common contemporaneous coefficient and $\bar{s}_{i,r}$ is a predetermined scaling factor that equals a long-run variance of variable r, for country i, estimated using an auxiliary AR(p) model. $\tau_{A,o}$ governs cross-country dispersion in equation o. Smaller values of $\tau_{A,o}$ imply stronger pooling of the country-specific contemporaneous coefficients toward their common values.

The common coefficients, $\bar{\alpha}_{o,r}$ are assigned Gaussian priors. Conditional on the country-specific matrices and their variance parameters, the common coefficients are sampled from their conjugate Gaussian posterior.

3.2 Stochastic volatility and identification

We allow the standard deviation of each structural shock to evolve over time. Specifically, define

$$\Lambda_{i,t} = \text{diag}\left(\exp(h_{i1,t}), \ldots, \exp(h_{ik,t})\right), \tag{8}$$

where $h_{ij,t}$ denotes the log standard deviation of structural shock j in country i. It follows the stationary AR(1) process

$$\begin{aligned} &h_{ij,t} = \rho_{ij} h_{ij,t-1} + \eta_{ij,t}, \\ &\eta_{ij,t} \sim \mathcal{N}\left(0, \sigma^2_{\eta,ij}\right), \qquad |\rho_{ij}| < 1, \qquad j = 1, \ldots, k. \end{aligned} \tag{9}$$

[2] Our specification provides a computationally convenient prior adhering to remarks by Kastner and Frühwirth-Schnatter (2014) and Gelman (2006) that a standard prior of inverse gamma tends to be over informative a posteriori.

This specification allows the model to accommodate time variation in the volatility of structural shocks, which is particularly relevant for small, open, and newer EU Member States.

We specify the following priors for the stochastic-volatility parameters:

$$\sigma^2_{\eta,ij} \mid S_{\eta,ij} \sim \mathcal{IG}\left(\frac{3}{2}, S_{\eta,ij}\right), \qquad S_{\eta,ij} \sim \mathcal{G}\left(0.8, 1\right), \tag{10}$$

$$\rho_{ij} \sim \mathcal{N}\left(0.9, 0.09\right) \mathbb{I}\{-1 < \rho_{ij} < 1\}, \tag{11}$$

for $i = 1, \ldots, N$ and $j = 1, \ldots, k$, the prior for ρ_{ij} favors persistent volatility dynamics while imposing stationarity. For the innovation variance $\sigma^2_{\eta,ij}$, which governs variation in the log standard deviation, we adopt a hierarchical prior that allows for mass near zero while retaining a sufficiently heavy right tail. This specification allows the data to support either nearly homoskedastic shocks or substantial time variation in volatility.[3] Conditional on ρ_{ij} and $\sigma^2_{\eta,ij}$, the initial state is drawn from the stationary distribution:

$$h_{ij,1} \mid \rho_{ij}, \sigma^2_{\eta,ij} \sim \mathcal{N}\left(0, \frac{\sigma^2_{\eta,ij}}{1-\rho^2_{ij}}\right). \tag{12}$$

In addition to capturing changes in shock uncertainty, stochastic volatility provides information for the statistical identification of $A_{0,i}$. Identification through heteroskedasticity builds on Rigobon (2003) and has been extended to more general forms of time-varying volatility by Lewis (2021). Our specification is related to the stochastic-volatility identification framework of Bertsche and Braun (2022) and the Bayesian order-invariant approach of Chan et al. (2024).

Provided that the structural volatilities exhibit sufficient independent variation, the contemporaneous matrix is statistically identified up to permutations and sign changes of its structural shocks. We normalize the signs by requiring the diagonal elements of $A_{0,i}$ to be positive. To address the remaining permutation indeterminacy and assign consistent economic labels across posterior draws and countries, we investigate impulse responses, evaluate historical time-series, volatility of shocks and conduct robustness checks using narrative restrictions following Antolín-Díaz and Rubio-Ramírez (2018a) and Carriero, Marcellino, et al. (2024).

The identified model is subsequently used to calculate impulse responses and historical decompositions. These objects trace the dynamic transmission of the structural shocks and quantify their contributions to macroeconomic developments during Russia's invasion of Ukraine.

3.3 Mixed-frequency extension

Higher-frequency data provide additional information for estimating short-run dynamics and may reveal adjustments that are obscured at the quarterly frequency. We therefore formulate

[3] A similar hierarchical prior we use for the hyperparameters governing cross-country pooling.

the model at the monthly frequency and represent it in state-space form. Unobserved monthly values of quarterly variables are sampled using the simulation smoother of Durbin and Koopman (2002).

For quarterly flow variables such as real GDP, we link the observed quarterly growth rate to the latent monthly growth rates using the standard mixed-frequency aggregation rule of Mariano and Murasawa (2003). Let $x_{i,t}^{Q}$ denote the observed quarterly growth rate in a quarter-ending month and let $x_{i,t}^{M}$ denote the corresponding latent monthly growth rate. The aggregation restriction is

$$x_{i,t}^{Q} = \frac{1}{3}x_{i,t}^{M} + \frac{2}{3}x_{i,t-1}^{M} + x_{i,t-2}^{M} + \frac{2}{3}x_{i,t-3}^{M} + \frac{1}{3}x_{i,t-4}^{M}. \tag{13}$$

The quarterly observation is available only in the final month of each quarter, while the remaining monthly observations are treated as missing. Conditional on the model parameters and the observed data, the simulation smoother generates draws of the latent monthly series.

4 Data

Our panel covers 21 EU countries from 2000M1 to 2025M12. The sample includes Austria, Belgium, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, and Sweden.[4]

Our main measure of geopolitical uncertainty is the Russia-specific Geopolitical Risk Index of Caldara and Iacoviello (2022). It measures the share of newspaper articles that discuss adverse geopolitical events and refer to Russia. Alternative geopolitical-risk measures are considered in the robustness analysis. However, we do not consider country-specific uncertainty measures, as we view the war in Ukraine as a global shock and use a common uncertainty measure to capture its shared effects.

Table 1 summarizes the nine variables included in the model. The system combines geopolitical risk, energy costs, financial conditions, economic sentiment, prices, trade, and real activity.

Brent oil prices capture global energy-cost pressures, while Euribor and national stock market indices measure common and country-specific financial conditions. The Economic Sentiment Indicator adds timely information about firms' and households' expectations. Including these fast-moving variables broadens the model's information set, capture structural shocks of anticipated nature and helps mitigate concerns about non-fundamentalness and VAR invertibility.[5]

Domestic prices and activity are represented by the HICP, GDP, industrial production, and

[4] Ireland is excluded because multinational-enterprise activity generates unusually large and volatile movements in headline GDP that are only weakly related to underlying domestic economic activity (Andersson et al., 2024).

[5] See Fernández-Villaverde et al. (2007), Lippi and Reichlin (1994), Forni and Gambetti (2014), and Leeper et al. (2013).

Table 1: Variables, Transformations, and Data Sources

Mnemonic	Variable	Transformation	Frequency	Source
GPRCRUSlog	Geopolitical Risk Index for Russia	Log level	Monthly	Caldara and Iacoviello (2022)
YERqoq	Real GDP at market prices	Quarterly log-diff	Quarterly	Eurostat
HICfinalmom	Harmonised Index of Consumer Prices	Monthly log-diff	Monthly	ECB
STN1y	One-year Euribor	Level	Monthly	Refinitiv
EQImomfinal	National stock market index	Monthly log-diff	Monthly	Refinitiv and ECB
ESI	Economic Sentiment Indicator	Level	Monthly	European Commission
POEusdmom	Brent crude oil price in US dollars	Monthly log-diff	Monthly	Refinitiv
IPexCmom	Industrial production excluding construction	Monthly log-diff	Monthly	Eurostat
IMPVOLmom	Import volume index	Monthly log-diff	Monthly	Eurostat

import volumes. GDP is observed quarterly, and its latent monthly path is inferred using the mixed-frequency state-space framework described in Section 3.3. All other variables are observed monthly.

With 21 countries, 312 monthly observations, and nine endogenous variables, our dataset constitutes, to our knowledge, one of the most extensive high-frequency panel SVAR applications to the macroeconomic transmission of geopolitical conflict in Europe. Our approach complements Federle, Meier, Müller, Mutschler, et al. (2026), who use annual data covering 60 countries over 150 years to study the medium- and long-run costs of war. By contrast, our dense monthly panel is designed to identify short-run transmission channels and cross-country heterogeneity surrounding Russia's invasion of Ukraine.

5 Results

In this section, we document our main empirical findings. Section 5.1 provides evidence supporting the interpretation of the identified shock as a geopolitical uncertainty shock. We then present the effects of the identified geopolitical uncertainty shock in Section 5.2. Section 5.3 explores heterogeneity in these effects across countries. Finally, Section 5.4 presents our counterfactual analysis and evaluates how real economic activity and inflation for each country would have evolved under the no-war scenario.

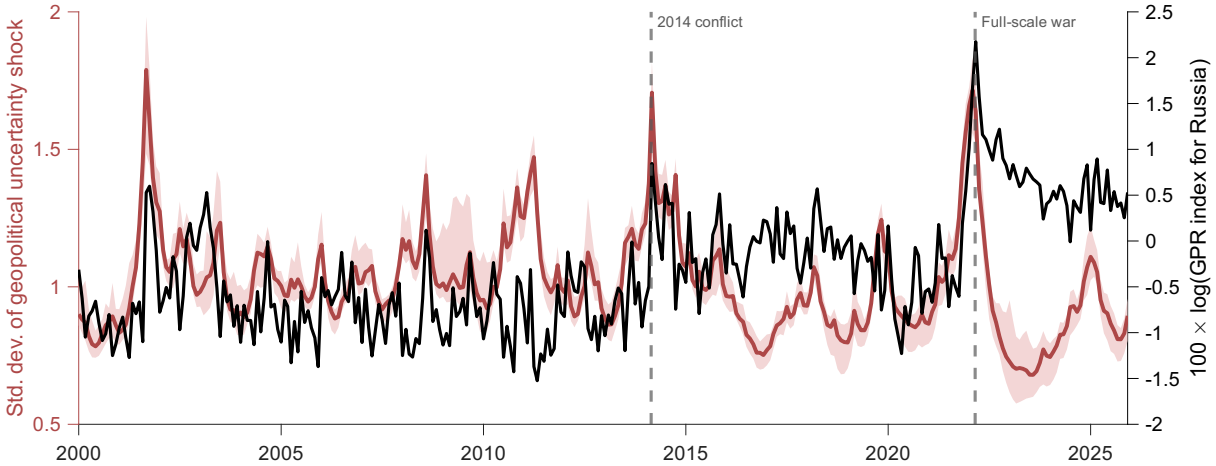
5.1 Heteroscedasticity and identifying geopolitical uncertainty shock

The identification through heteroscedasticity does not, by itself, assign an economic interpretation to the recovered shocks. We therefore draw on several complementary pieces of evidence to interpret our selected shock candidate as a geopolitical uncertainty shock.

Figure 3 plots the estimated standard deviation of the geopolitical uncertainty shock alongside Russia's GPR index. Because the country-specific estimates exhibit similar dynamics, we report their cross-country median, while the shaded area denotes the range across countries. Estimated shock volatility increases around major geopolitical events, with particularly pronounced spikes during the 2014 Annexation of Crimea and at the onset of the war in 2022. It subsequently declines even though the GPR index remains elevated. This pattern reflects the model's stochastic-volatility specification: periods of heightened geopolitical uncertainty are identified by unusually large innovations to the GPR index rather than by a persistently high level of the index itself. In this respect, our methodology closely relates to the concept of uncertainty developed by Jurado et al. (2015), which is based on the conditional volatility of the unforecastable components of a broad set of economic variables.

The identified shock also accounts for a substantial share of the forecast error variance of the GPR index at very short horizons, approximately 96% on impulse. This finding is consistent with results obtained using alternative identification approaches in the literature, including the recursive identification scheme of Bloom (2009) and the max-share identification strategy employed by Carriero and Volpicella (2025). Although the robustness of these identification schemes has recently been questioned by Kilian et al. (2025), our heteroscedasticity-based approach reproduces the key regularities documented in earlier studies without relying on these alternative identifying restrictions.

Figure 3: Time-varying volatility of Geopolitical Uncertainty Shocks



Notes: The solid line depicts the median estimated standard deviation of geopolitical uncertainty shocks across the 21 countries. The shaded band shows the range of country-specific estimates. The Russia GPR index is plotted as 100 log(GPR) on the right-hand axis.

Additional support for geopolitical uncertainty interpretation comes from the estimated impulse responses, which closely resemble the effects of uncertainty shocks predicted by fully specified dynamic structural models. We examine these responses next.

5.2 Effects of geopolitical uncertainty

Figure 4 presents the impulse responses implied by the hierarchical population-level parameters, $\overline{\beta}_{o,r}$ and $\overline{\alpha}_{o,r}$. These responses can be interpreted as the model-implied responses for a typical country in the 21-country sample. Importantly, they are not arithmetic averages of the country-specific impulse responses.

The geopolitical uncertainty shock inflicts an immediate and persistent increase in geopolitical uncertainty. On impact, this increase is accompanied by a deterioration in economic sentiment and a decline in equity prices, indicating lower confidence and a rapid repricing of risk. Real activity weakens with a lag, as reflected in declines in both real GDP and industrial production. Following a short-lived initial increase, import volumes also decline, consistent with weakening domestic demand. The contraction in activity subsequently places downward pressure on prices: oil prices fall, consistent with weaker global demand, and aggregate HICP inflation declines. The joint decline in real activity and inflation is consistent with the broader uncertainty literature, which finds that heightened uncertainty is associated with weaker economic activity and lower inflation (Leduc and Liu, 2016; Basu and Bundick, 2017). We proceed by suggesting that the effects of uncertainty shocks vary across countries.

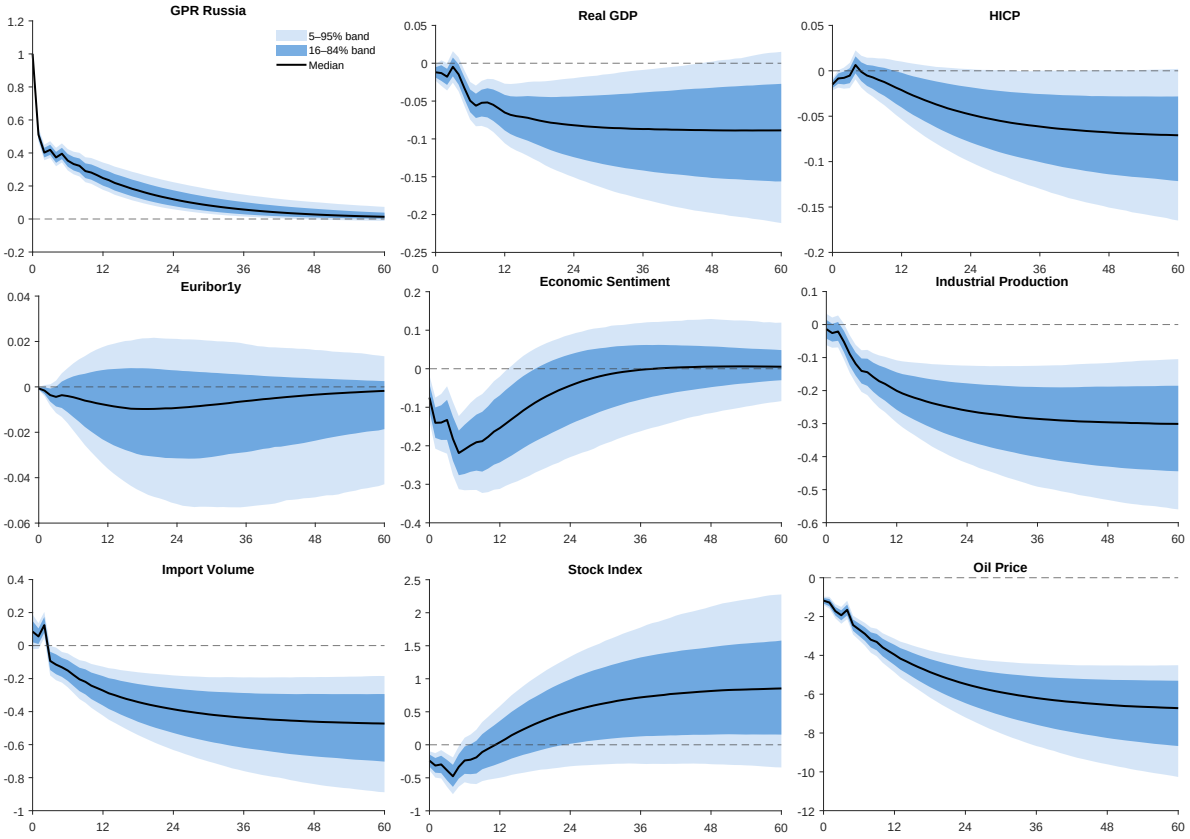
5.3 Heterogeneous effects across countries

Figure 5 reports posterior median for impulse response functions of GDP, industrial production, and HICP inflation for the geopolitical uncertainty shock on impact ($h = 0$) and after 11 months ($h = 11$), along with the 68% and 90% credible intervals. To ensure comparability, the responses are normalized so that the shock raises the GPR index for Russia by 1% on impact.

On impact, the geopolitical uncertainty shock lowers real GDP in nearly every country and reduces HICP inflation throughout the sample. The initial response of industrial production is comparatively muted, but it becomes negative in every country after 11 months. At that horizon, real GDP also remains below baseline in nearly all countries, while inflation remains lower in most of the sample. Taken together, the joint declines in real activity and inflation indicate that the geopolitical uncertainty shock operates primarily as an adverse demand shock.

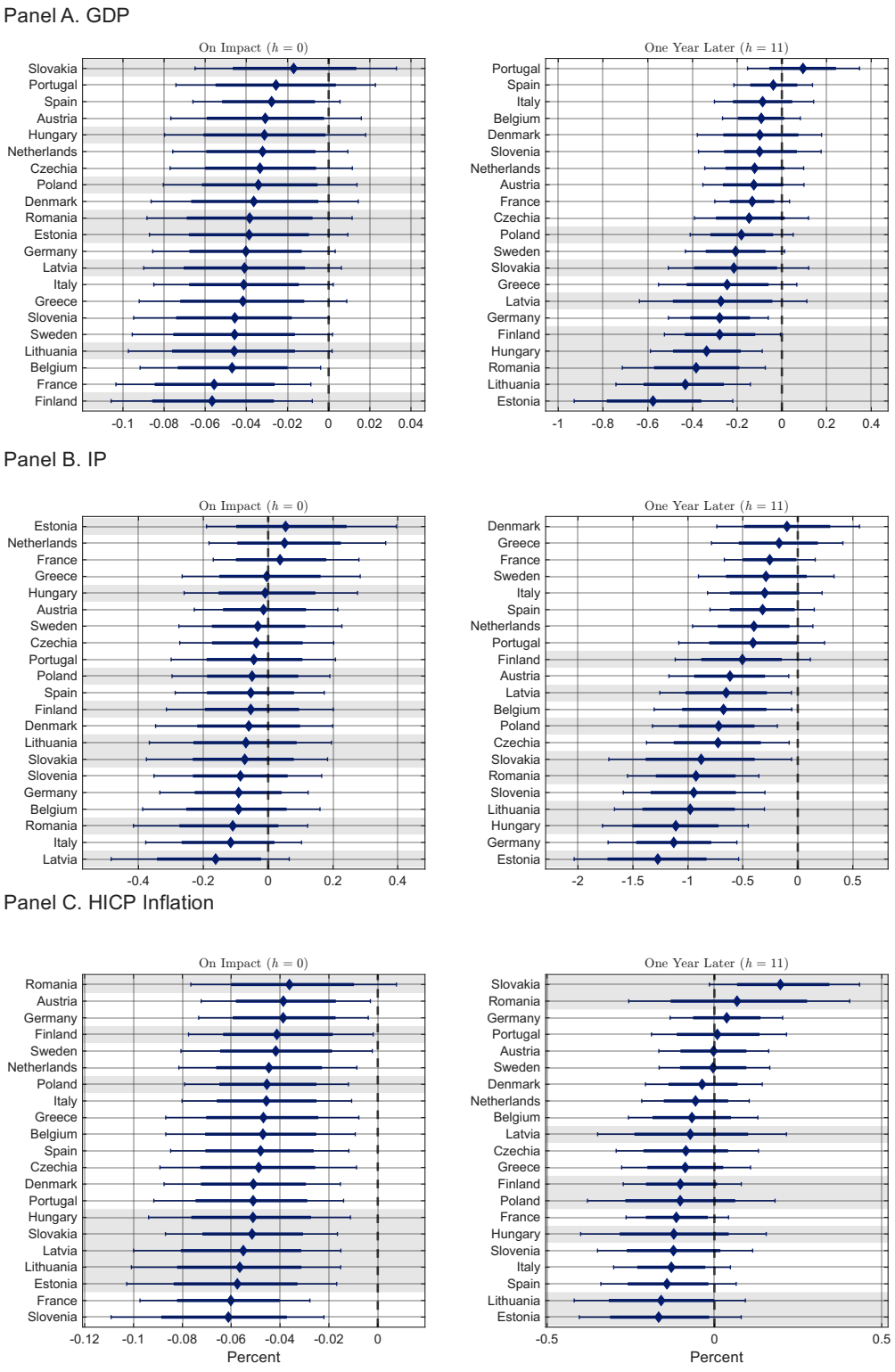
The magnitude of these effects nevertheless varies considerably across countries. After 11 months, some of the largest median declines in both real GDP and industrial production occur in Estonia, Lithuania, and Romania, whereas the GDP responses in Portugal, Spain, and Italy are comparatively small. Portugal is the only country with a positive median GDP response at this horizon, although its industrial production response remains negative. More broadly, the

Figure 4: Average Impulse Responses to a Geopolitical Uncertainty Shock



Notes: The figure presents impulse responses implied by the hierarchical population-level parameter. These responses capture the common cross-country component and can therefore be interpreted as the model-implied average, or typical, impulse responses across the 21 countries. The solid line reports the posterior median. The dark shaded region denotes the 16th–84th percentile credible interval, while the light shaded region denotes the 5th–95th percentile credible interval. The horizontal dashed line marks zero, and the horizontal axis reports the horizon following the shock.

Figure 5: Responses to a Geopolitical Uncertainty Shock



Notes: Panels A–C report the responses of real GDP, industrial production, and HICP inflation on impact and after 11 months. The shock is scaled to raise the GPR index for Russia by 1% on impact. Horizontal lines denote 68% and 90% posterior credible intervals. Grey-shaded rows indicate countries in the eastern group.

contraction in real activity tends to be larger in economies located closer to the conflict. This geographical pattern is consistent with the proximity channel documented by Federle, Meier, Müller, and Sehn (2026) and Federle, Meier, Müller, Mutschler, and Schularick (2026). The counterfactual analysis below provides further evidence on the importance of this channel.

5.4 The "No-War" counterfactual

We use the estimated model to construct a "no-war" counterfactual that removes two prominent developments associated with Russia's invasion of Ukraine: increase in geopolitical risk and energy costs. Specifically, we impose that

1. the identified geopolitical uncertainty shocks are set to zero during 2022Q1; and
2. Brent oil prices follow the futures-implied path observed between 26 and 28 December 2021.[6]

The term "no-war" is therefore shorthand for a scenario that removes these two war-related channels rather than all consequences of the invasion that are immense and complex.

Distinguishing between the two channels is important. Geopolitical shocks may operate primarily through uncertainty, confidence, and aggregate demand, whereas shocks transmitted through energy markets resemble adverse supply disturbances. These channels can therefore have different, and potentially opposing, implications for inflation and economic activity. For example, Pinchetti (2026) distinguish geopolitical shocks transmitted through energy markets from those operating mainly through uncertainty and aggregate demand. Similarly, Verduzco-Bustos and Zanetti (2026) show that geopolitical oil-price shocks behave like severe supply disturbances. A related distinction also underlies the scenario analysis presented by European Central Bank (2026) in their macroeconomic projections.

In our counterfactual, setting geopolitical uncertainty shocks to zero removes the direct uncertainty channel, while conditioning Brent oil prices on the pre-invasion futures curve removes the unexpected energy-price increase not explained by those shocks.

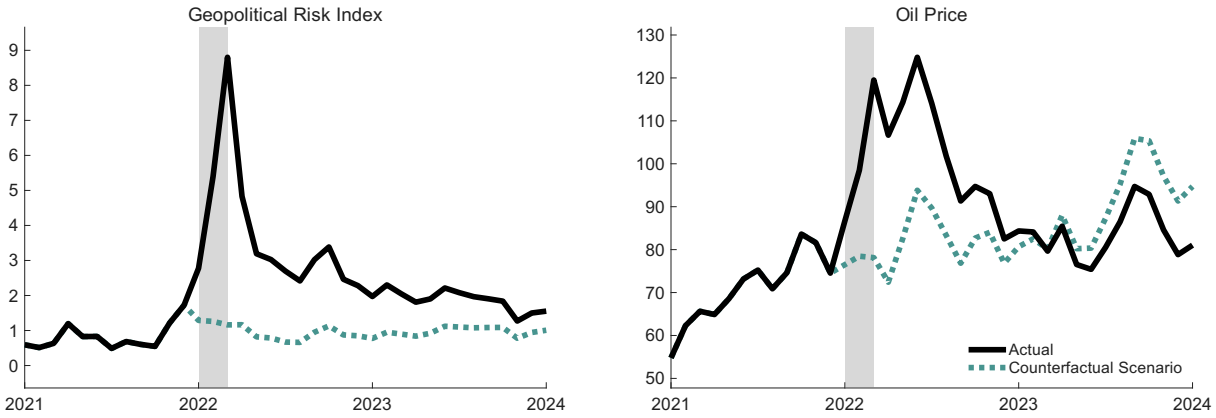
Following Bańbura et al. (2015) and Antolín-Díaz, Petrella, et al. (2021), we impose the two restrictions jointly and construct the corresponding counterfactual paths. All remaining structural shocks are drawn from their conditional distribution, allowing other economic developments to evolve consistently with the model. Repeating the exercise across posterior draws yields a posterior distribution for each counterfactual path.

Figure 6 illustrates the imposed counterfactual conditions. The panels compare the observed paths of the Russia-specific GPR index and Brent oil prices with their corresponding counterfactual paths. Solid lines denote the observed data, dotted lines denote the estimated "no-war"

[6]This assumption is similar to the ECB's technical assumptions, which are likewise based on market expectations averaged over a specified observation period.(European Central Bank, 2026)

paths, and the shaded region marks the period during which the counterfactual restrictions are imposed.

Figure 6: Observed and Counterfactual Paths of Geopolitical Risk Index for Russia and Brent Oil Prices



Notes: Solid lines depict observed data and dotted lines show the posterior median"no-war" counterfactual paths. The shaded area denotes 2022Q1, when geopolitical uncertainty shocks are removed and Brent prices are conditioned on the December 2021 futures curve.

As is evident from the figure, the sharp increases in the GPR index for Russia and in oil prices in 2022 would have been absent if geopolitical uncertainty shocks had not occurred in 2022Q1 and Brent prices had followed their futures path over the same period. Under this counterfactual, the GPR index would have remained persistently lower even three years later. Oil prices would have risen much less in 2022 and would thereafter have evolved according to the estimated dynamics of the model.

Effects on real activity Figure 7 provides a comparison of observed GDP with its no-war path for Lithuania, Germany and Spain. This choice is motivated by the two groups of East and West countries we have discussed previously. Later, we extend this analysis and provide a comparison to all countries.

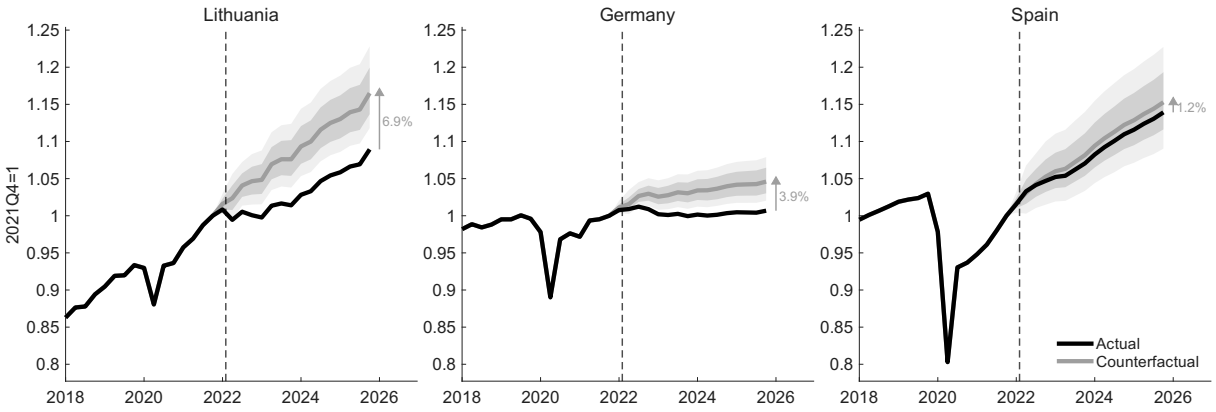
We see that the difference is largest for Lithuania. By the end of 2025, GDP would have been 6.9% higher in Lithuania under the no-war counterfactual. This number is 3.9% for Germany and 1.2% for Spain.

Figure 8 adds more information about the counterfactual path of GDP by presenting the corresponding annual growth rates and the contributions of geopolitical uncertainty and energy-price shocks. The dots show observed growth, the grey bars show growth under the no-war scenario, and the blue and brown bars report the contributions of geopolitical uncertainty and energy-price shocks.

For Lithuania, we see that counterfactual GDP growth is about 4.6% in 2022, compared with observed growth close to zero. Energy-price shocks account for around 3.6 percentage points of

this difference, while geopolitical uncertainty accounts for a further 0.9 percentage points. The gap narrows and becomes relatively small in the following years. Germany displays a similar but less pronounced pattern. Counterfactual growth is about 2.9% in 2022, compared with observed growth of around 0.9%. The contributions also become smaller toward the end of the sample. For Spain, both contributions are comparatively small. Accordingly, observed GDP growth remains relatively close to its counterfactual path.

Figure 7: Observed and Counterfactual Paths of Real GDP in Lithuania, Germany and Spain



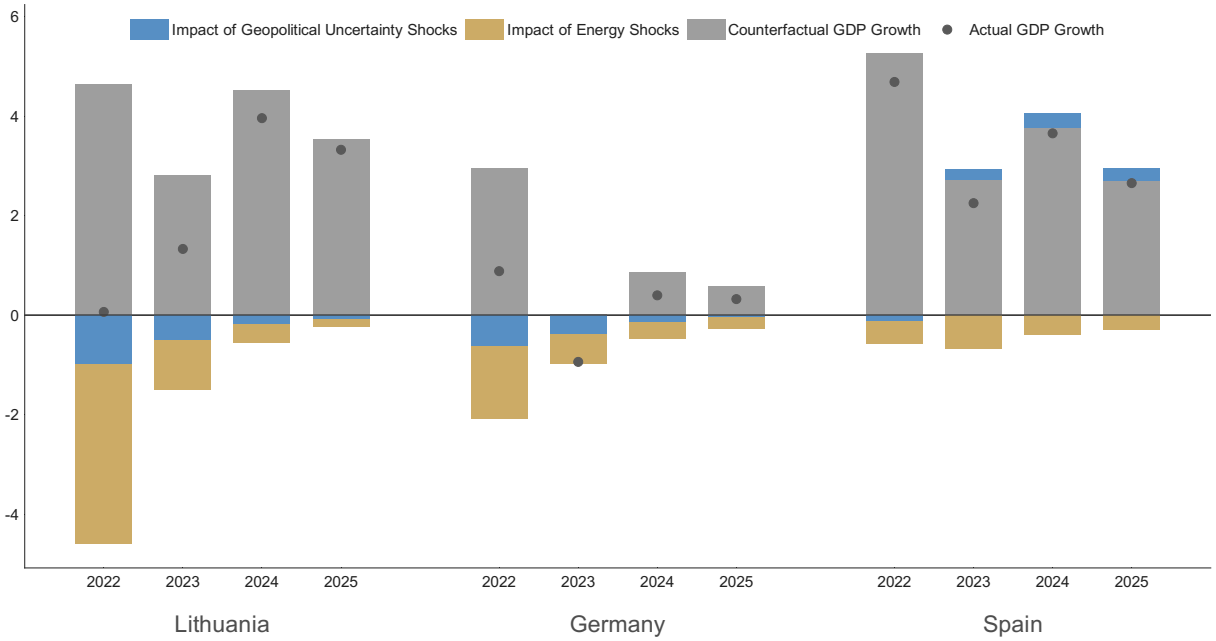
Notes: GDP is normalized to one in 2021Q4. Dark-shaded areas are 68% credible intervals; 90% intervals include the light-shaded areas. Posterior median counterfactual paths are shown as solid grey lines.

How do these results compare with those for the other European economies? Figure 9 shows the posterior medians of counterfactual GDP growth over 2022 and 2025 for all 21 countries. Countries are ordered from left to right according to the estimated contribution of geopolitical uncertainty shocks. Appendix Figure A.1 reports the corresponding credible intervals.

The contribution of geopolitical uncertainty to cumulative GDP growth differs markedly across countries. At the left of Figure 9, the posterior median implies a loss of nearly 3 percentage points in Estonia and around 2 percentage points in Romania and Lithuania. Slovakia and Finland also have sizeable negative contributions. At the right of the figure, the corresponding estimate for Italy is close to zero, while those for Spain and Portugal are positive. The appendix intervals preserve the contrast at these ends: Estonia's contribution remains negative across its reported interval, whereas the median estimates for Spain and Portugal lie above zero.

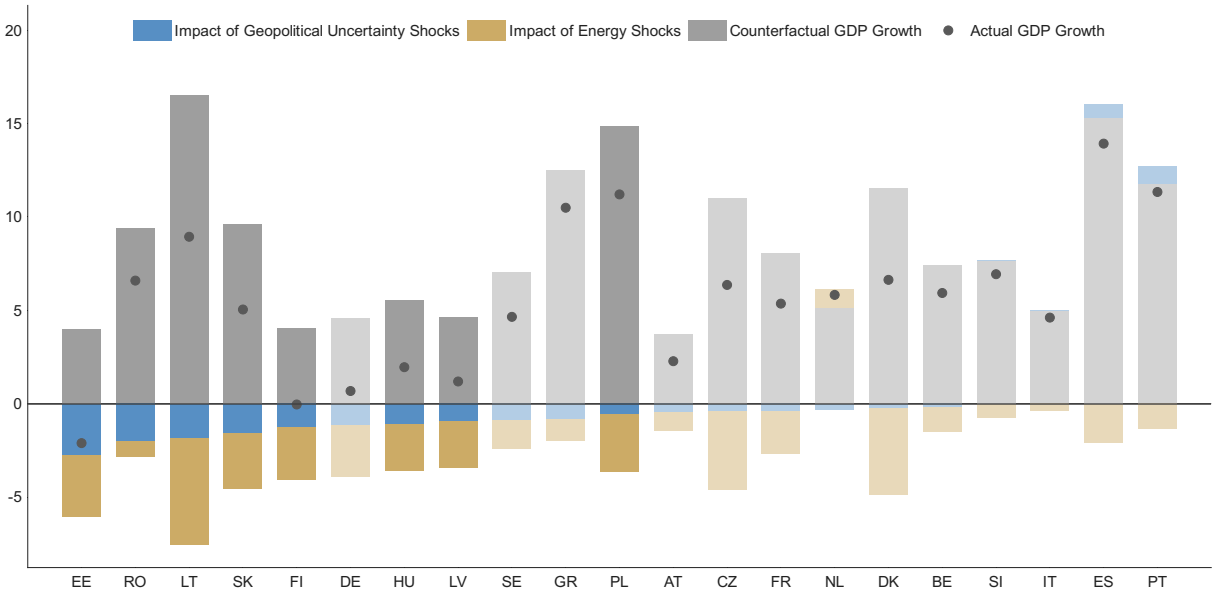
The countries with the largest estimated uncertainty losses are mostly in eastern Europe, as indicated with darker shade. This pattern is consistent with the evidence on proximity to war in Federle, Meier, Müller, Mutschler, et al. (2026) and European Commission (2025), although the country ordering is not determined by geography alone. Germany has a noticeable negative contribution, while Poland's is relatively modest and Latvia lies closer to the middle of the distribution. The figure thus shows both a broad regional pattern and substantial variation within the region.

Figure 8: Observed and Counterfactual Real GDP Growth in Lithuania, Germany, and Spain



Notes: Dots report observed annual GDP growth. Bars show the posterior median estimates of counterfactual growth and the contributions of geopolitical uncertainty and energy-price shocks. All entries are in percentage points.

Figure 9: Real GDP Growth across Countries, 2021Q4–2025Q4



Notes: The figure reports real GDP growth over 2021Q4–2025Q4. Dots report observed growth; bars show posterior median counterfactual growth and the median contributions of geopolitical uncertainty and energy-price shocks. Countries are ordered by the estimated contribution of geopolitical uncertainty shocks. All entries are in percentage points.

Energy prices tell a different cross-country story. Their estimated contribution lowers GDP growth in most countries, but the ranking is not the same as for the uncertainty contribution. In Romania, for example, the uncertainty contribution is among the largest, while the energy-price contribution is comparatively small. Denmark shows the reverse: a large energy-price contribution accompanies a much smaller uncertainty contribution. One possible explanation is that exposure to geopolitical uncertainty reflects proximity and perceived security risks, whereas the effects of higher energy prices also depend on energy intensity, the energy mix, and reliance on imported fossil fuels. The overall GDP shortfall thus combines two components whose relative importance differs considerably across countries.

Effects on Inflation Figure 10 reports the corresponding HICP inflation results for Lithuania, Germany, and Spain. In each country, the largest gap between observed and counterfactual inflation occurs in 2022. The median energy-price contribution is about 5.9 percentage points in Lithuania and 4.5 percentage points in Germany and Spain, accounting for most of the gap that year. Geopolitical uncertainty makes a smaller, negligible contribution to inflation, which is negative in most countries. This pattern is consistent with the demand-type responses documented above but also contributions presented in ECB policy scenarios (European Central Bank, 2026). The two components thus have opposing effects on prices even though both tend to lower real activity.

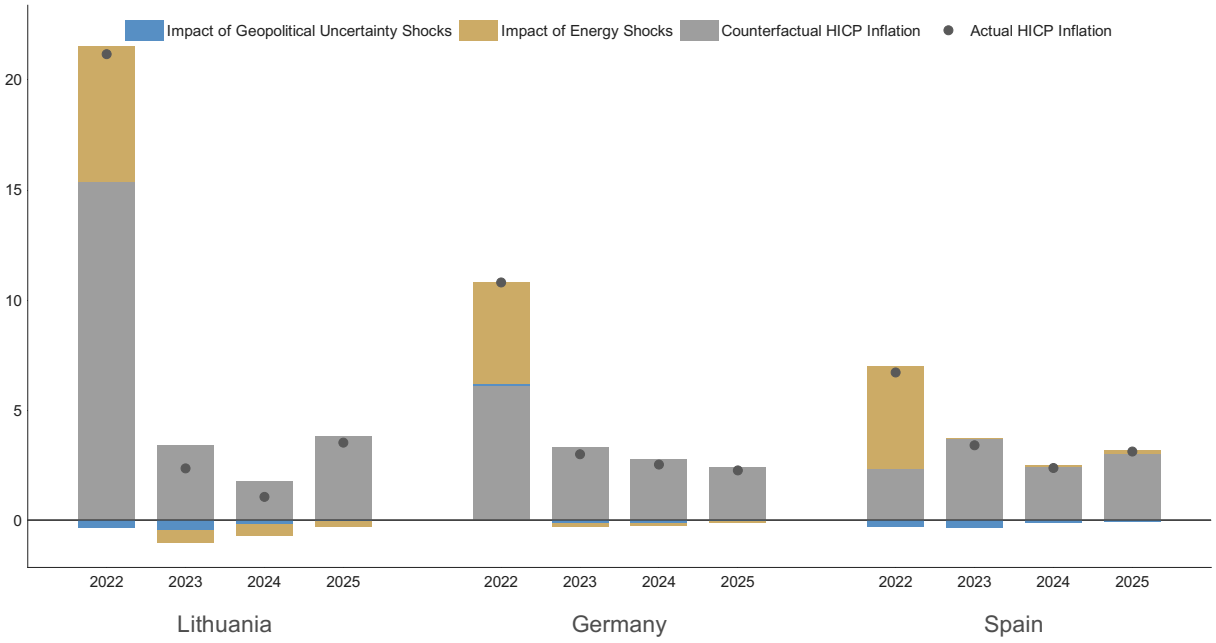
Figure 11 extends the comparison to all 21 countries, ordered by the energy-price contribution.[7] The median energy-price contribution to cumulative inflation is positive in every country, but its size differs substantially. It reaches roughly 7–10 percentage points in Czechia, Romania, Slovakia, the Netherlands, and Latvia, compared with 2–3 percentage points in France, Slovenia, Sweden, and Estonia. The contrast between the Netherlands and Estonia illustrates why proximity alone does not describe this ranking: the Netherlands is among the most affected countries, whereas Estonia is among the least affected. In most countries, geopolitical uncertainty partly offsets the inflationary contribution of energy prices. However, our counterfactual analysis suggests that war-related increases in energy prices made a large contribution to the sharp rise in inflation, particularly in 2022.

6 The initial impact versus the subsequent recovery

In the previous section, we showed that countries closer to the war tend to experience larger declines in real activity due to geopolitical uncertainty. In this section we seek to understand how the countries hit hardest performed relative to the European aggregate afterwards. To answer this question, we compare four GDP paths: observed and counterfactual GDP for each country, and observed and counterfactual aggregate GDP from the 21 countries included in our panel.

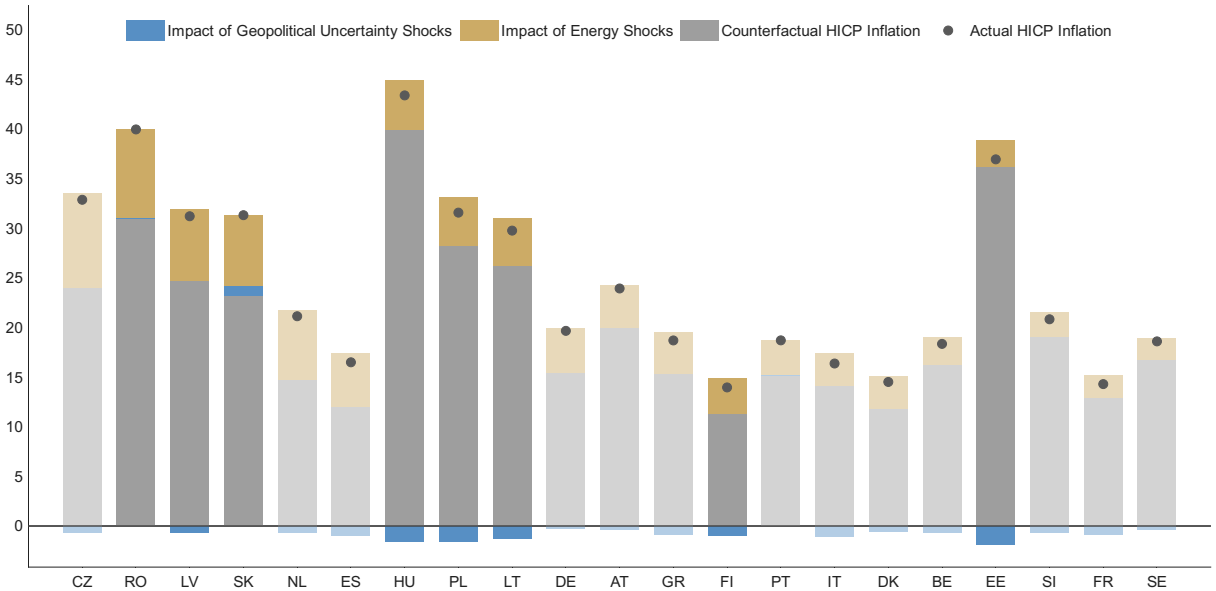
[7] Appendix Figure A.2 reports the corresponding credible intervals

Figure 10: Observed and Counterfactual HICP Inflation in Lithuania, Germany, and Spain



Notes: Dots denote observed year-on-year HICP inflation. Bars report the posterior median of counterfactual inflation and the estimated contributions of geopolitical uncertainty and energy-price shocks. All values are expressed in percentage points.

Figure 11: HICP Inflation across Countries, 2021Q4–2025Q4



Notes: Dots report observed inflation. Bars show median counterfactual inflation and the estimated contributions of geopolitical uncertainty and energy-price shocks. Countries are ordered by the estimated contribution of energy-price shocks. All entries are in percentage points.

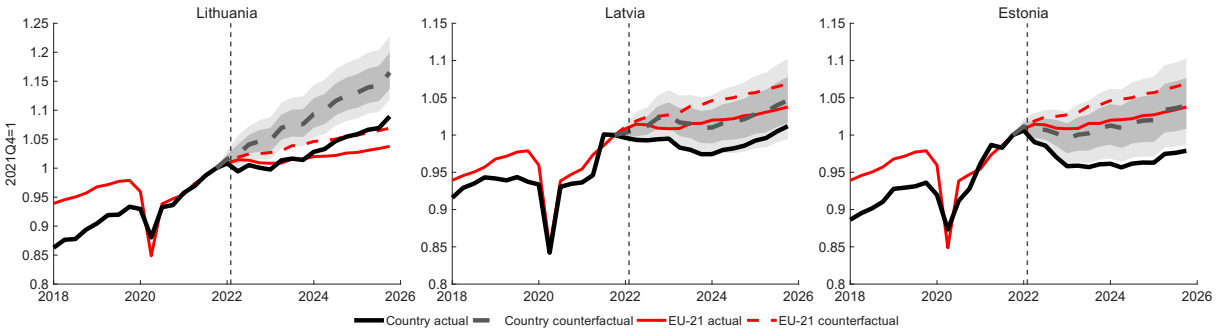
Let $\tilde{y}_{i,t}$ denote the real GDP of country i, normalized to one in 2021Q4. The EU-21 series are constructed by aggregating the normalized country GDP series:

$$\tilde{y}_t = \sum_{i=1}^{21} w_i \tilde{y}_{i,t}, \qquad \tilde{y}_t^{nw} = \sum_{i=1}^{21} w_i \tilde{y}_{i,t}^{nw}, \tag{14}$$

where w_i is country i's share of 2021 GDP among the 21 countries, measured at purchasing power parity. The gap between the EU-21's observed and counterfactual paths captures the contribution of the war-related shocks we consider here. Comparing each country's observed path with the EU-21 shows how it performed relative to the aggregate after 2022. Moreover, their counterfactual paths show how each country would have performed relative to the EU-21 in the absence of the war.

Figure 12 compares the observed and counterfactual GDP paths of the Baltic countries with those of the EU-21. The three countries are close to the conflict, but their paths after 2022 differ considerably. Lithuania experienced a larger estimated loss than the EU-21, as shown by the wider gap between its observed and counterfactual paths. Yet it grew more rapidly after 2024 and was about 9% above its 2021Q4 level at the end of the sample, compared with about 3% for the EU-21. Moreover, its counterfactual path also grows faster than that of the EU-21, suggesting that its GDP would have grown faster than the aggregate without the war. By contrast, Latvia and Estonia recovered more slowly than the EU-21, and the gap between their counterfactual paths and the corresponding EU-21 path shows that their GDP would have also grown more slowly than the aggregate under the no-war scenario.

Figure 12: Observed and Counterfactual Real GDP Paths in the Baltic Countries and the EU-21 Aggregate



Notes: The figure shows observed and counterfactual real GDP paths for Lithuania, Latvia, Estonia versus the corresponding paths for the aggregate of the 21 economies in the sample. All series are normalized to one in 2021Q4. Grey dashed lines depict the median counterfactual paths. Dark-shaded areas are 68% credible intervals for each country's counterfactual path; 90% intervals include the light-shaded areas.

Figure A.3 in the Appendix extends this comparison to a broader set of East and West countries, additionally including Poland, Hungary, Finland, Germany, Spain, and Portugal. Several points are worth making. First, Finland and Hungary follow a similar pattern to Latvia and Estonia:

their observed GDP falls short of the EU-21 path, and their counterfactual GDP also remained below that of the aggregate. Second, Poland, similar to Lithuania, initially experienced a large estimated loss but recovered rapidly relative to the EU-21 aggregate. Finally, for Spain and Portugal, in sharp contrast, the small gap between their observed and counterfactual paths suggest that both countries have been affected by the war to a smaller extent, and grew faster than the EU-21 aggregate after 2022. Taken together, these results show that countries with large estimated war-related losses subsequently followed markedly different growth paths, even among those close to the conflict. The counterfactual paths suggest that some of these differences would have remained in the absence of the geopolitical uncertainty and energy-price shocks considered here.

7 Robustness

In our baseline analysis documented thus far, we have relied on the GPR index for Russia and identified geopolitical uncertainty shocks through heteroskedasticity. We now examine whether our results are robust to using alternative measures of geopolitical risk, imposing an additional restriction on the identification of the uncertainty shock, and alternative treatments of energy prices. We consider five alternative specifications.

Narrative Restriction The first specification adds a narrative sign restriction to the baseline model. Our baseline normalization requires the geopolitical uncertainty shock to raise the GPR index on impact, but it does not use information about any particular historical episode. Following Antolín-Díaz and Rubio-Ramírez (2018b), we additionally require the shock identified in February 2022 to make a positive contribution to the GPR index for Russia. This restriction uses the onset of the war in February 2022 as additional identifying information while achieving identification through heteroskedasticity following the rejection algorithm of Carriero, Marcellino, et al. (2024).

Alternative Geopolitical Risk Index The second robustness check replaces the GPR index for Russia with the corresponding index for Ukraine constructed by Caldara and Iacoviello (2022). We then reestimate the model and repeat the counterfactual exercise using the Ukraine index. All other elements of the baseline analysis, including the oil-price condition, are left unchanged.

Common Geopolitical Risk Factor The third specification treats the GPR indexes for Russia ($y_{RUS,t}$) and Ukraine ($y_{UKR,t}$) as noisy measures of a common geopolitical risk factor

$(x_{GPR,i,t})$[8]:

$$y_{RUS,t} = x_{GPR,i,t} + e_{RUS,i,t} \qquad e_{RUS,i,t} \sim N(0, \sigma^2_{RUS,i}) \tag{15}$$

$$y_{UKR,t} = x_{GPR,i,t} + e_{UKR,i,t} \qquad e_{UKR,i,t} \sim N(0, \sigma^2_{UKR,i}) \tag{16}$$

With this factor, we repeat the counterfactual exercise to assess robustness to using the common variation in the two indices.

Alternative Energy-Price Specifications The fourth and fifth specifications examine whether our findings are robust to incorporating natural gas prices. The fourth adds gas prices to the baseline model and imposes an additional condition that they follow their December 2021 futures path during 2022Q1.[9] The fifth replaces oil prices with a synthetic energy price combining oil and gas prices and conditions this index on the corresponding futures path over the same period.[10] In both cases, we reestimate the model and repeat the counterfactual exercise, retaining the baseline restriction on geopolitical uncertainty shocks.

Figure 13 shows median counterfactual GDP growth over 2021Q4-2025Q4 and the corresponding contributions of geopolitical uncertainty and energy-price shocks under the baseline and the five alternative specifications. Countries are ordered by the estimated contribution of geopolitical uncertainty shocks from the baseline analysis.

The results are reassuring. Adding the narrative restrictions leaves the estimated contribution of geopolitical uncertainty close to the baseline in most countries. Estonia, Romania, Lithuania, Slovakia, Finland, and Germany remain among the countries with the largest estimated reductions in GDP growth due to geopolitical uncertainty shocks.

Replacing the Russian GPR index with the Ukrainian index does not change the pattern of larger estimated losses in countries closer to the conflict. The common GPR factor yields contributions similar to those obtained with the Ukrainian index, while the energy-price contributions remain broadly similar across these specifications.

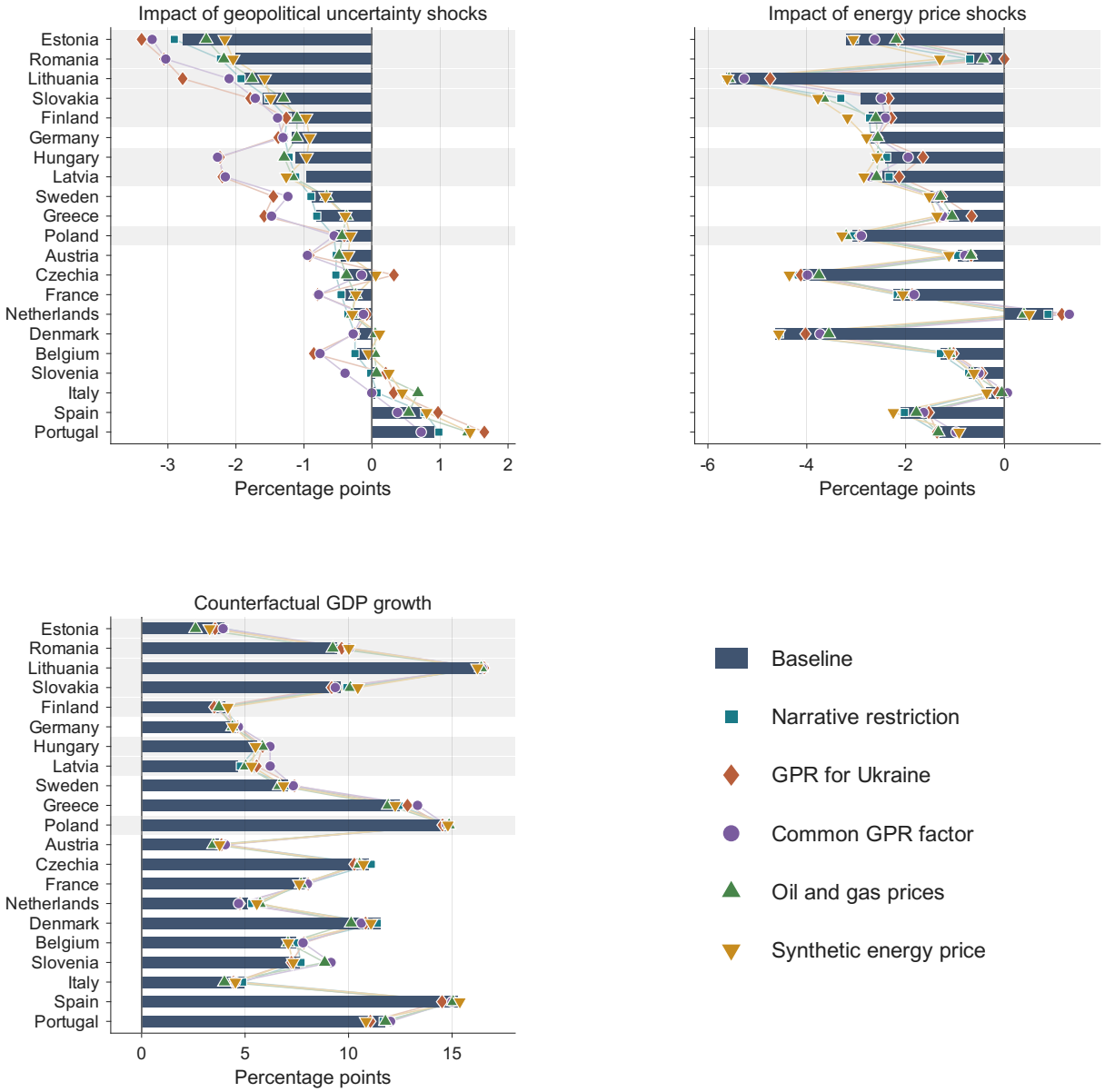
Accounting for gas prices also leaves the main picture unchanged. Both additional specifications yield geopolitical uncertainty contributions close to the baseline in most countries. The synthetic energy index implies larger negative energy contributions in some economies, including Romania, Slovakia, and Finland, but counterfactual GDP growth changes relatively little. The contribution of energy-price shocks also remains broadly similar across these specifica-

[8] We rescale Ukraine's geopolitical uncertainty index to match the first two moments of Russia's geopolitical risk index.

[9] We use Dutch Title Transfer Facility (TTF) natural gas prices, available from 2006, and extend the series backward to cover the full sample using natural gas prices from the World Bank's Pink Sheet (World Bank, 2026).

[10] Following the approach used by the ECB, the synthetic energy price index is constructed as a weighted average of oil and gas prices, both expressed in USD/MWh, with weights reflecting their country-specific shares in net imports. To this end, TTF gas prices, originally quoted in EUR/MWh, are converted into US dollars using the EUR/USD exchange rate.

Figure 13: Robustness: GDP Growth and Counterfactual Effects of Geopolitical Uncertainty and Energy Shocks, 2021Q4–2025Q4



Notes: The figure shows the counterfactual GDP growth over 2021Q4–2025Q4, along with the corresponding contributions of geopolitical uncertainty and energy-price shocks. The baseline case uses the GPR index for Russia, as in Figure 9. "GPR for Ukraine" uses the GPR index for Ukraine instead. "Common GPR factor" uses instead a common factor extracted from the GPR indexes for Russia and Ukraine. "Narrative restriction" adds narrative restrictions to the baseline case. "Oil and gas prices" adds gas prices to the model and conditions both oil and gas prices on their December 2021 futures paths during 2022Q1. "Synthetic energy price" replaces oil prices with an index combining oil and gas prices and conditions this index on the corresponding futures path over the same period. Grey-shaded rows indicate countries in the eastern group. Countries are ordered by the estimated contribution of geopolitical uncertainty shocks in our baseline analysis. All values are in percentage points.

tions. Taken together, these results support our main finding: both geopolitical uncertainty and energy-price shocks contributed to the growth shortfall, with the contribution of geopolitical uncertainty being larger for eastern European economies.

8 Conclusion

This paper studies how the geopolitical uncertainty and energy-price movements associated with the Russia–Ukraine war affected real activity and inflation across 21 European countries. We estimate a Bayesian panel VAR that allows the coefficients to differ across countries and identify geopolitical uncertainty shocks through changes in their volatility. We then construct a "no-war" counterfactual by removing these shocks during 2022Q1 and conditioning Brent prices over the same period on the futures path observed in December 2021.

Three main findings emerge. First, geopolitical uncertainty shocks have properties similar to demand shocks: they generally reduce GDP, industrial production, and inflation. Their effects on real activity are highly heterogeneous. Countries closer to the conflict tend to experience larger losses. For example, under our counterfactual, Lithuania's GDP at the end of 2025 would have been about 6.9% higher, whereas around 3.9% for Germany and 1.2% for Spain.

Second, the large increases in energy prices are associated with lower real activity and had a substantial contribution to the inflation surge in the European economy. Unlike the real-activity effects of geopolitical uncertainty, however, the inflationary contribution of energy prices displays much less clear geographical pattern.

Finally, we document that countries which were strongly affected after the war started, followed quite different subsequent growth paths. Lithuania's GDP grew faster than the EU-21 aggregate through 2025, as did Poland's, while Latvia and Estonia recovered more slowly.

These results underscore the importance of treating the war as a set of distinct disturbances rather than a single shock. Geopolitical uncertainty and energy prices rose together in early 2022 but had different effects: the former reduced economic activity and inflation, while the latter moved them in opposite directions. These disturbances also had very difference consequences across the European economies.

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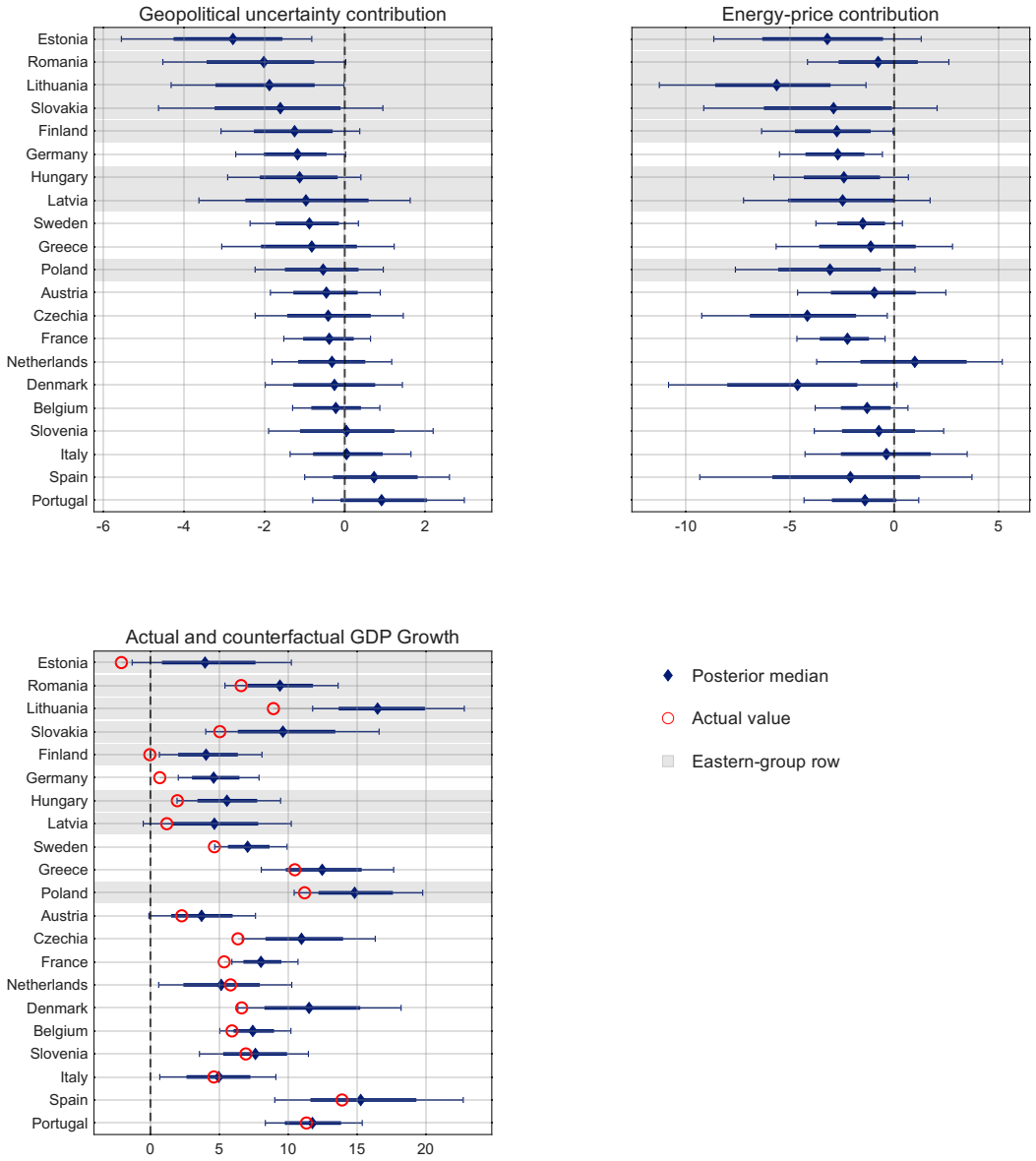
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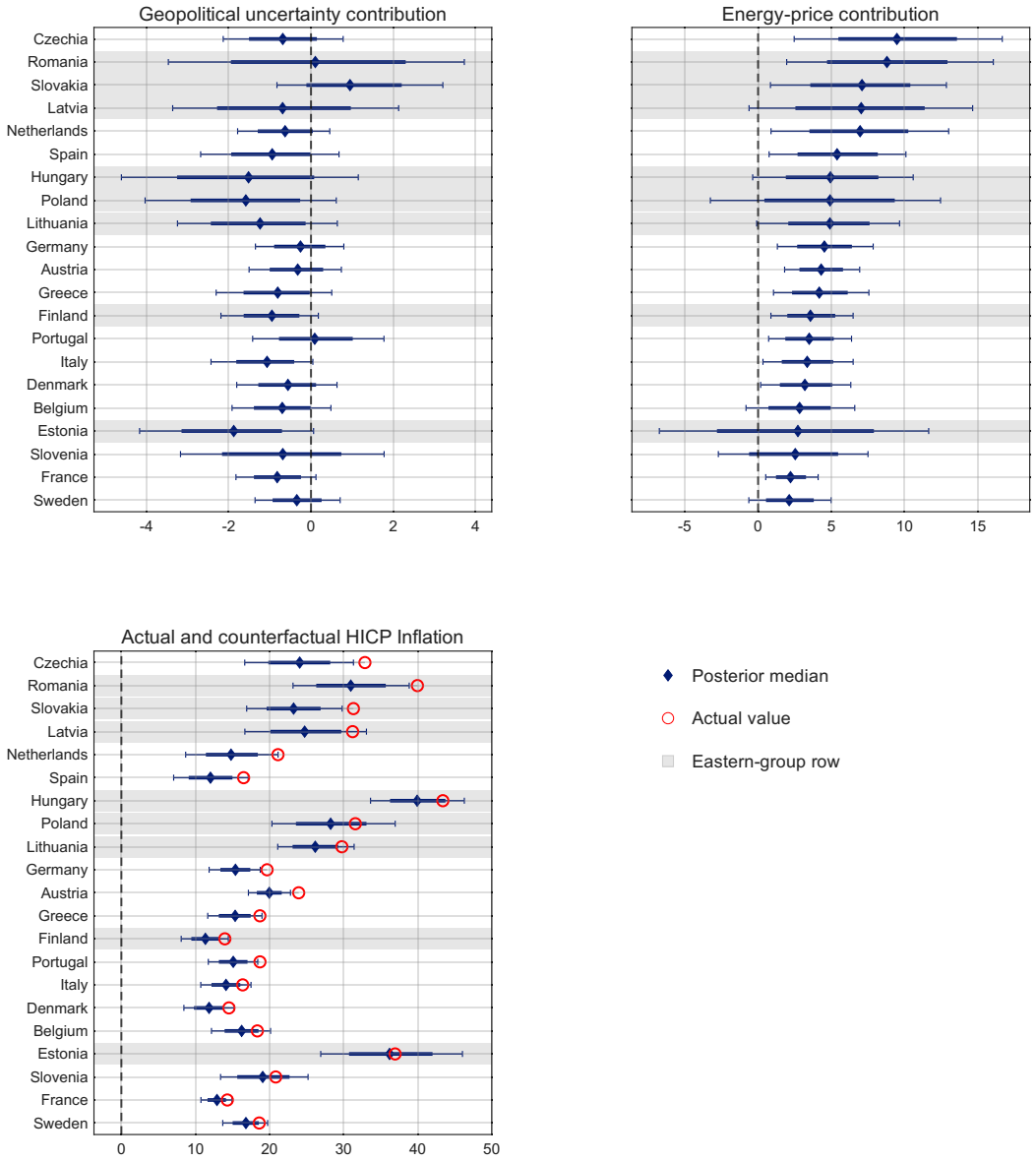
A Additional Figures

Figure A.1: Contributions to Cumulative Real GDP Growth, 2021Q4–2025Q4



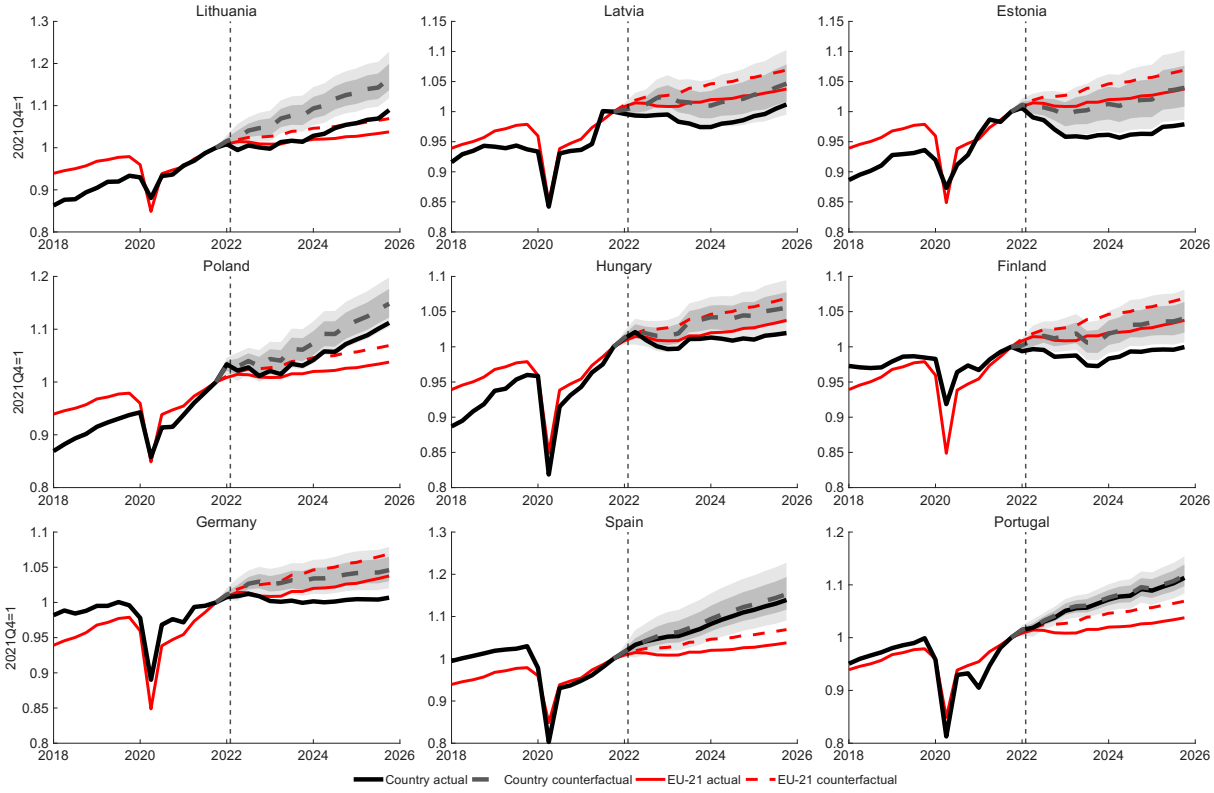
Notes: The upper panels show the estimated contributions of geopolitical uncertainty and energy-price shocks. The lower panel compares observed growth (red circles) with median "no-war" counterfactual growth (blue diamonds). Thick and thin whiskers show 68% and 90% credible intervals, respectively. Grey-shaded rows indicate countries in the eastern group. Countries are ordered by the median contribution of geopolitical uncertainty shocks. All values are in percentage points.

Figure A.2: Contributions to Cumulative HICP Inflation, 2021Q4–2025Q4



Notes: The upper panels show the estimated contributions of geopolitical uncertainty and energy-price shocks. The lower panel compares observed inflation (red circles) with median "no-war" counterfactual inflation (blue diamonds). Thick and thin whiskers show 68% and 90% credible intervals, respectively. Grey-shaded rows indicate countries in the eastern group. Countries are ordered by the median contribution of energy-price shocks. All values are in percentage points.

Figure A.3: Observed and Counterfactual Real GDP Paths for Selected Countries



Notes: The figure shows observed and counterfactual real GDP paths for selected countries versus the corresponding paths for the aggregate of the 21 economies in the sample. All series are normalized to one in 2021Q4. Grey dashed lines depict the median counterfactual paths. Dark-shaded areas are 68% credible intervals for each country's counterfactual path; 90% intervals include the light-shaded areas.