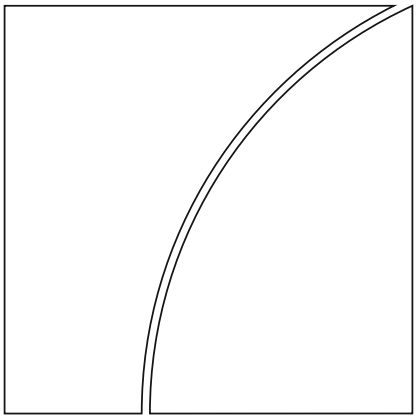

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JEL classification: E31, E32, F42, F51

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Geopolitical Risk in the Euro Area: Measurement and Transmission*

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Abstract

Geopolitical risk is a major concern for the euro area, yet widely used measures largely reflect a US perspective. We introduce a geopolitical risk indicator tailored to the euro area using local European news sources. Shocks to this index have significant recessionary and inflationary consequences in the euro area, effects that would be missed when relying on the corresponding US-based measure. We estimate that the war in Ukraine imposed substantial output losses and inflationary pressures on the euro area in 2022. Combining structural scenario analysis with end-of-sample nowcasting, we show that euro area prospects are highly sensitive to future developments in geopolitical risk. We complement these analyses with two news-based measures of sanctions intensity and shortages for the euro area.

Keywords: euro area, geopolitical risk, inflation, sanctions, shortages

JEL classification: E31, E32, F42, F51.

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1 Introduction

Geopolitical risk (GPR) has emerged as a key driver of macroeconomic and financial fluctuations, especially since the war in Ukraine and, more recently, the armed conflicts in the Middle East. A widely used measure of GPR in empirical macro-financial analysis is the seminal index of Caldara and Iacoviello (2022), which summarizes newspaper coverage of war, conflict, and terrorism into a time series. Although often used as a global measure, the index reflects an 'Anglosphere' and especially US-centric perspective.[1]

The purpose of this paper is to measure GPR as perceived in the euro area – one of the world's largest economic blocs and one that is substantially exposed to recent geopolitical tensions. Specifically, we introduce a new targeted measure: the euro area geopolitical risk (EA GPR) index, which we make available at daily and monthly frequencies. Constructed exclusively from European newspapers, the index is specifically tailored to the euro area. As emphasized by Bondarenko et al. (2024), local perspectives matter, as exposure to GPR depends on the degree of a region's involvement in, or stake in, a given conflict, which in turn shapes its economic responses to geopolitical events. More generally, this paper provides a comprehensive framework for measuring and analyzing geopolitical risk in the euro area. First, we conduct structural exercises that quantify the macroeconomic costs of the war in Ukraine and assess euro area prospects under alternative future paths of GPR amid the recent conflicts in the Middle East. Second, we construct two additional news-based indices that capture sanctions intensity and shortages as perceived in the euro area.[2]

We construct the EA GPR index from newspaper coverage in major euro area countries. This ensures broad coverage while preserving a sufficiently long time series. Comparing the EA and Anglosphere GPR indices reveals a pronounced divergence in 2022 due to the war in Ukraine. While the EA index exhibits a level shift upward, the Anglosphere measure does not. This divergence, along with others, highlights the importance of measuring geopolitical risk from a European perspective.

We show that the measurement of GPR has important implications for macro-financial analysis, as the macroeconomic effects of a GPR shock are understated when the European perspective is ignored. To this end, we estimate a Bayesian vector autoregression (VAR) for the euro area and adjust it for the COVID-19 period, which allows us to analyze a long pre-pandemic sample together with recent geopolitical events within a consistent framework. We find that an EA GPR shock lowers economic activity and raises prices in the euro area, consistent with a supply-type disturbance, and leads to a tightening of monetary policy. In contrast, the Anglosphere GPR indicator yields insignificant responses of euro area production and broad CPI, with the production response even turning positive. This

[1] Specifically, the index is constructed from six US newspapers, three UK ones, and one Canadian source.

[2] The daily and monthly EA GPR indicators, the underlying country-level GPR measures, as well as sanctions and shortages indicators for the euro area, are available at https://github.com/YvesSchueler/EuroAreaGPR/raw/refs/heads/main/EA_GPR_Paper.xlsx. The same file also provides a European Union GPR index.

suggests that the recent divergence between euro area and Anglosphere measures is not a short-lived outlier, but reflects more structural differences in how geopolitical risk has been perceived and transmitted over our sample starting in 1998.

Equipped with this euro area specific measure, we next quantify the macroeconomic cost of the war in Ukraine for the euro area economy through a 'No-War' counterfactual. This exercise provides an estimate of the macroeconomic dynamics that would have prevailed absent the increase in geopolitical risk associated with the invasion. Specifically, we hold the EA GPR index at its December 2021 level to remove the sharp rise in geopolitical risk following the invasion. Relative to this counterfactual, industrial production (IP) is around 1% lower and prices around 0.6% higher by mid-2022. Monetary policy is tightened in response, albeit with a delay. These results suggest that the war in Ukraine had an economically important impact on euro area macroeconomic dynamics.

Beyond this backward-looking counterfactual, we also assess euro area prospects under alternative future paths of geopolitical risk amid the recent conflicts in the Middle East. Combining structural scenario analysis with end-of-sample nowcasting, we show that the euro area outlook is highly sensitive to alternative paths of the driving geopolitical risk shock, which generate materially different trajectories for industrial production, prices, and the policy rate even over a short horizon.

We next ask through which channels such effects are transmitted. To answer this question, we draw on our broader toolkit, which includes news-based indicators of sanctions intensity and shortages for the euro area. In two counterfactual exercises, we find that the sanctions channel plays only a limited role for the euro area, whereas shortages emerge as an important transmission mechanism, accounting for a substantial share of the inflationary effects.

Our paper contributes to the literature on geoeconomics, which studies the links between geopolitics and economics, and is surveyed in Mohr and Trebesch (2025). More specifically, it is related to the measurement and the macroeconomic effects of geopolitical risk, a literature spearheaded by Caldara and Iacoviello (2022). In their study, they introduce a GPR index based on newspaper coverage and document its effects on economic activity. Importantly, they construct their index using English-language newspapers. As a result, it reflects a predominantly Anglosphere – and in particular US-centric – perspective on geopolitical risk developments. Bondarenko et al. (2024) argue that accounting for a local perspective is crucial to capture the underlying geopolitical risk perceptions of a country or region.[3] They propose constructing GPR measures directly from local news sources and show that a GPR index based on Russian-language newspapers has substantially stronger effects on the Russian economy.[4] Building on this approach, we construct a novel GPR indicator for

[3]The importance of accounting for different risk perceptions is also emphasized in the theoretical geoeconomics framework of Clayton et al. (2023) with hegemonic and non-hegemonic countries.

[4]While Caldara and Iacoviello (2022) provide also country-specific GPR measures by conditioning their search on country names or capitals, the underlying perspective remains unchanged, as these indices are derived from the same Anglosphere news sources. This can result in substantial measurement errors, as

the euro area, enabling an analysis of geopolitical risk from a euro area perspective. More broadly, our paper contributes to the strand of literature that proposes refinements to the measurement of geopolitical risk (e.g., Hassan et al., 2019; Fernández-Villaverde et al., 2024; Alonso-Alvarez et al., 2025; Clayton et al., 2025; Iacoviello and Tong, 2026).

While a growing literature evaluates different facets of geopolitical risk in the euro area, e.g. Bouoiyour et al. (2019), Brignone et al. (2024), Dieckelmann et al. (2024), Pinchetti (2024), these papers usually rely on the Anglosphere GPR measure. Our paper contributes to this literature by constructing a euro area specific measure and showing that it implies stronger and statistically significant macroeconomic effects. Regarding macroeconomic outcomes, the literature tends to find that output contracts (Caldara and Iacoviello, 2022; Bondarenko et al., 2024) and inflation rises (Hodula et al., 2024; Caldara et al., 2026). In other words, GPR shocks act as adverse supply shocks, in line with historical evidence from Federle et al. (2024). Gorodnichenko et al. (2025) show that European households expect a fall in output combined with elevated inflation for a prolongation of a geopolitical conflict. Our results confirm these findings and expectations. In particular, our structural analyses show sizable macroeconomic costs for the euro area for the war in Ukraine and reveal a high sensitivity of euro area prospects to future geopolitical risk developments.

A growing body of empirical work studies various channels through which geopolitical risk affects economic outcomes (e.g. Grebe et al., 2024; Kilian et al., 2024; Federle et al., 2024; Luetticke et al., 2025; Ambrocio et al., 2025). We focus here on the role of sanctions and shortages in the transmission of geopolitical risk shocks to the euro area economy. Both the sanctions channel and the shortages channel materialize as supply disruptions, depressing output and pushing up prices. For our analysis, we construct two new newspaper-based indicators, namely a euro area sanctions intensity index based on work of Laudati and Pesaran (2023) and Bondarenko et al. (2024), and a euro area shortages index based on Caldara et al. (2025). In this way, we provide a comprehensive toolset to conduct geopolitical risk analysis for the euro area. We illustrate that geopolitical risk shocks propagate beyond the sanctions channel, which has only a limited impact. This part of our work connects directly to the recent theoretical literature on sanctions, which studies their design and effects (e.g., Bianchi and Sosa-Padilla, 2023, 2024; Becko, 2024; Ghironi et al., 2025; Lewis and Puangjit, 2026).

The remainder of the paper is structured as follows. Section 2 explains how we construct our geopolitical risk indicator for the euro area. We show the resulting time series and compare it with the Anglosphere geopolitical risk index introduced by Caldara and Iacoviello (2022). Section 3 presents our baseline VAR results, develops a 'No-War' counterfactual to evaluate the economic costs of the 2022 surge in geopolitical risk following the Russia-Ukraine conflict, and conducts structural scenario analyses to assess euro area prospects

illustrated for the case of Finland by Ambrocio et al. (2025). The "Anglosphere-centric" Finnish GPR index spikes due the Helsinki summit in 2018, where US president Donald Trump and Russian president Vladimir Putin met, driven by the interest of the English media instead of a meaningful change in Finnish GPR.

under alternative future paths of GPR amid the conflicts in the Middle East. Section 4 introduces newly constructed indicators of sanctions intensity and supply shortages in the euro area, which we use to assess potential transmission channels of geopolitical risk. Section 5 concludes.

2 A geopolitical risk indicator for the euro area

We construct our euro area geopolitical risk (EA GPR) indicator based on newspaper coverage in the five largest euro area economies: Germany, France, Italy, Spain, and the Netherlands. We choose these countries to strike a balance between a sufficiently long span of local newspaper availability and coverage of the euro area.[5]

Focusing on the five largest economies in the euro area provides a representative proxy for measuring the economic impact of geopolitical risk on the euro area economy. According to Eurostat data, as of 2024, Germany, France, Italy, Spain, and the Netherlands account for 28.4%, 19.2%, 14.4%, 10.5%, and 7.4% of the euro area's GDP, respectively – together representing nearly 80% of the total aggregate. In contrast, eastern-flank nations more directly affected by the war in Ukraine, including Finland, Estonia, Latvia, Lithuania, Slovakia, and Slovenia, constitute a relatively marginal share of the euro area. Collectively, these countries account for only 4.2% of total GDP, with Finland representing the largest individual share at 1.8%.

We measure how often terms related to war, conflict, and terrorism appear in leading local newspapers and use this information to track perceptions of geopolitical risk across time. By focusing on local media sources, the indicator is designed to capture how Europeans perceive geopolitical threats and events, rather than relying exclusively on a US-centric perspective.

Methodologically, our approach builds on Caldara and Iacoviello (2022), who develop a newspaper-based index of geopolitical risk. Their English-language search query is adapted to the Dow Jones Factiva database and translated into German, French, Italian, Spanish, and Dutch. To account for the specifics of the different languages, we create translated search queries using a combination of professional translators and large language models, and verify them with native-language economists. The precise wording of the search query in each language is documented in Appendix A.

Table 1 shows the list of newspapers, while further information on each newspaper is provided in Appendix B. Employing the Dow Jones Factiva repository, we select the newspapers with the highest circulation, subject to their availability in the database, to have a broad press coverage.[6] We exclude tabloids and regional papers to ensure comparability.

[5]We focus on the largest five countries as we do not have access to a sufficiently long time span of newspapers in each member state. For instance, for the geopolitically very exposed euro area countries Estonia, Latvia, and Lithuania, we only have in our database access to articles starting from the year 2021, 2022, and 2021, respectively.

[6] Unfortunately, we lack access to four major Dutch newspapers: Algemeen Dagblad, De Telegraaf,

Table 1: Newspaper sources underlying euro area geopolitical risk index

Country	**Sources**
Germany	Frankfurter Allgemeine Zeitung, Süddeutsche Zeitung, Handelsblatt, Die Welt, taz - die tageszeitung
France	Le Monde, Le Figaro, Les Echos, La Tribune
Italy	Il Sole 24 Ore, Corriere della Sera, La Repubblica, La Stampa, Italia Oggi, Milano Finanza
Spain	El País, El Mundo, ABC, La Vanguardia, Expansión, Cinco Días
Netherlands	ANP Binnenland, Reformatorisch Dagblad, Dutch Government News, ANP Economie, De Groene Amsterdammer

We then construct country-specific GPR indicators by sourcing information from these local newspapers. An alternative approach is to use the entire set of newspapers available for a specific country in Factiva, as done, for instance, by Meinerding et al. (2023). The resulting indices, one based on the selected newspapers and the other based on the entire universe of country-specific newspapers available, display very similar dynamics. Appendix C compares the two approaches.

For each country, we then compute the monthly share of articles that get selected through the local language geopolitical risk search phrase relative to the total number of articles in the same set of newspapers. This yields five country-specific indices that reflect local reporting of geopolitical risk in each country.

To obtain a single measure for the euro area, we aggregate the five country indices using their respective GDP weights, which are normalized to sum to one across the five included countries, reflecting the relative economic importance of each economy within the group. This weighting ensures that the aggregate indicator is representative of the euro area as a whole. The construction of the index can be summarized as:

$$\text{EA GPR}_t = \sum_{i \in \mathcal{C}} \omega_i \frac{\text{GPR articles}_{i,t}}{\text{total articles}_{i,t}} \times sc_i, \qquad \mathcal{C} = \{\text{DE, FR, ES, IT, NL}\}, \tag{1}$$

where ω_i is country i's respective GDP weight in January 2024, $\text{GPR articles}_{i,t}/\text{total articles}_{i,t}$ gives the country-specific share of articles related to geopolitical risk in month t, and sc_i is a scaling factor that normalizes all country indices to 1 in January 2010. This month lies close to the midpoint of our sample and does not coincide with any major geopolitical shocks, providing a neutral reference point that is not distorted by exceptional events. Our sample period starts in January 1998, one year prior to the introduction of the euro, and runs until March 2026. We continuously update our indicators.

Figure 1 shows the monthly EA GPR index (solid line) from January 1998 until March 2026.[7] Our indicator captures major global events such as the Kosovo War, the Iraq War

Trouw, and De Volkskrant. Furthermore, given the constraints of the Dow Jones Factiva database, more generally, our NL GPR index only starts in September 2007.

[7]Appendix D plots the GPR index by country.

and the Paris Terrorist Attacks. We observe the largest spike in the indicator for the major escalation of the war in Ukraine in February 2022. We also observe that this event triggered a level shift in geopolitical risk, as GPR has stayed elevated since.

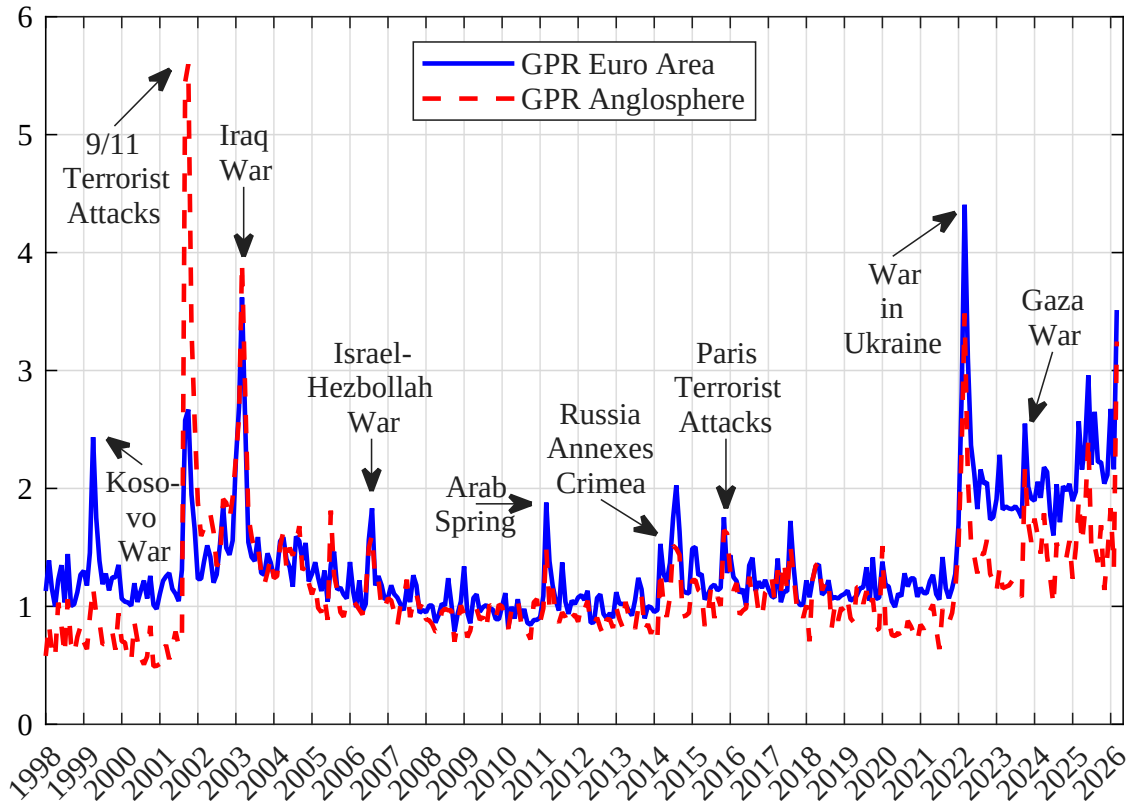

Figure 1: Geopolitical risk index at monthly frequency: Euro area and Anglosphere

Notes: The euro area GPR index is an aggregate of five country-level GPR indices based on local newspapers in the respective languages. The Anglosphere GPR index from Caldara and Iacoviello (2022) is a text-based measure using English-language newspapers. For comparability, both indices are normalized to equal 1 in January 2010.

To put these dynamics into context, we compare our index to its Anglosphere counterpart provided by Caldara and Iacoviello (2022), displayed through the red dashed line in Figure 1. We also normalize their index to 1 in January 2010. This procedure aligns the two indices on an identical starting point and thereby makes them comparable. To avoid the differences being driven by using a different database, we also compare the EA GPR to an equivalent Anglosphere measure constructed from the Factiva database. The similarities and differences that we obtain are virtually the same, as shown in Appendix G.

Although both indices exhibit common spikes around major global events, a comparison reveals notable differences in the evolution of geopolitical risk across regions. In particular, the euro area index rises relatively more for conflicts closer to Europe, e.g., the escalation of the war in Ukraine in February 2022 and the Kosovo War. Figure 1 also suggests that GPR, from a European perspective, has remained much more elevated since 2022 due to the war in Ukraine. Europeans thus appear to have a distinct weighting of geopolitical events in their risk assessment, underscoring how geography and local narratives shape risk perceptions.

This partly reflects a 'proximity penalty': conflicts impose a disproportionate economic toll on nearby economies (Federle et al., 2024). In fact, the war in Ukraine led to the largest rise in EA GPR, while from the US perspective, the peak in geopolitical risk was reached after the 9/11 terrorist attacks. Clearly, then, the two measures of GPR are very different.

Figure 2 formally summarizes the historical co-movement between the two indices. The blue line plots the standardized residuals from a regression of the EA GPR index on the Caldara and Iacoviello (2022) Anglosphere GPR measure and a constant. The regression coefficient is significantly positive, confirming that both indices co-move on average. The residuals highlight episodes in which one index responds disproportionately relative to the full-sample (1998-2026) historical relation. For example, the sharp negative spike around 9/11 reflects a much stronger reporting in Anglosphere media than would be expected given typical differences between the two measures. Most striking, however, is the sustained rise of the residuals toward the end of the sample. This indicates that geopolitical risk, as captured in euro area media, has remained persistently above what the historical relation with the Anglosphere index would predict. Almost all of the residuals lie outside the one-standard-deviation band (black dashed lines), pointing to an unusually large divergence between the two measures relative to historical norms after the onset of the war in Ukraine.

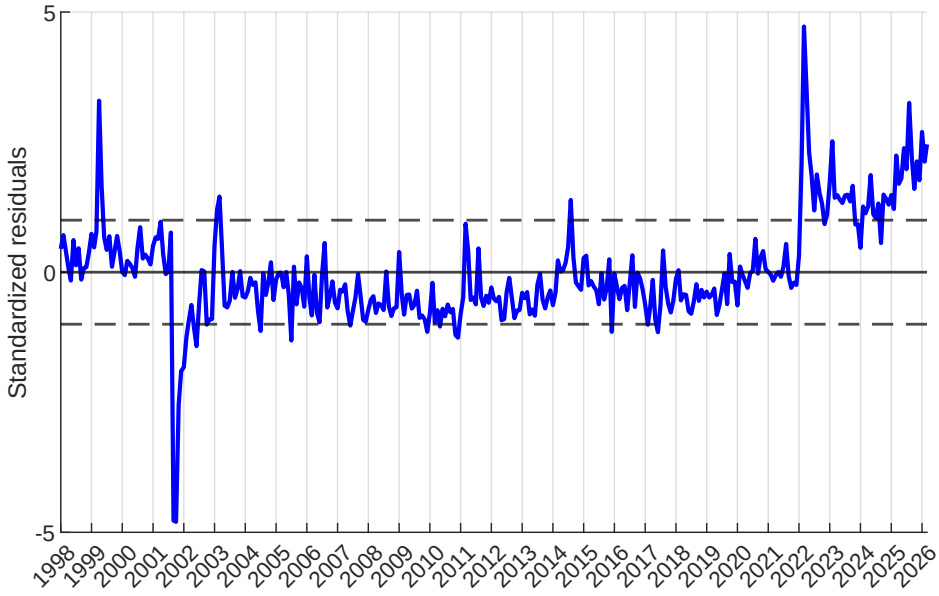

Figure 2: Regressing EA GPR on Anglosphere GPR

Notes: The figure shows the standardized residuals from a regression of the EA GPR index on the Anglosphere GPR index and a constant. The black dashed lines give the one-standard deviation band.

To summarize, by combining local perspectives into an integrated measure, the EA GPR index highlights the importance of the role of proximity to geopolitical risk in shaping perceptions, and provides a euro area complement to the Anglosphere GPR index of Caldara and Iacoviello (2022).

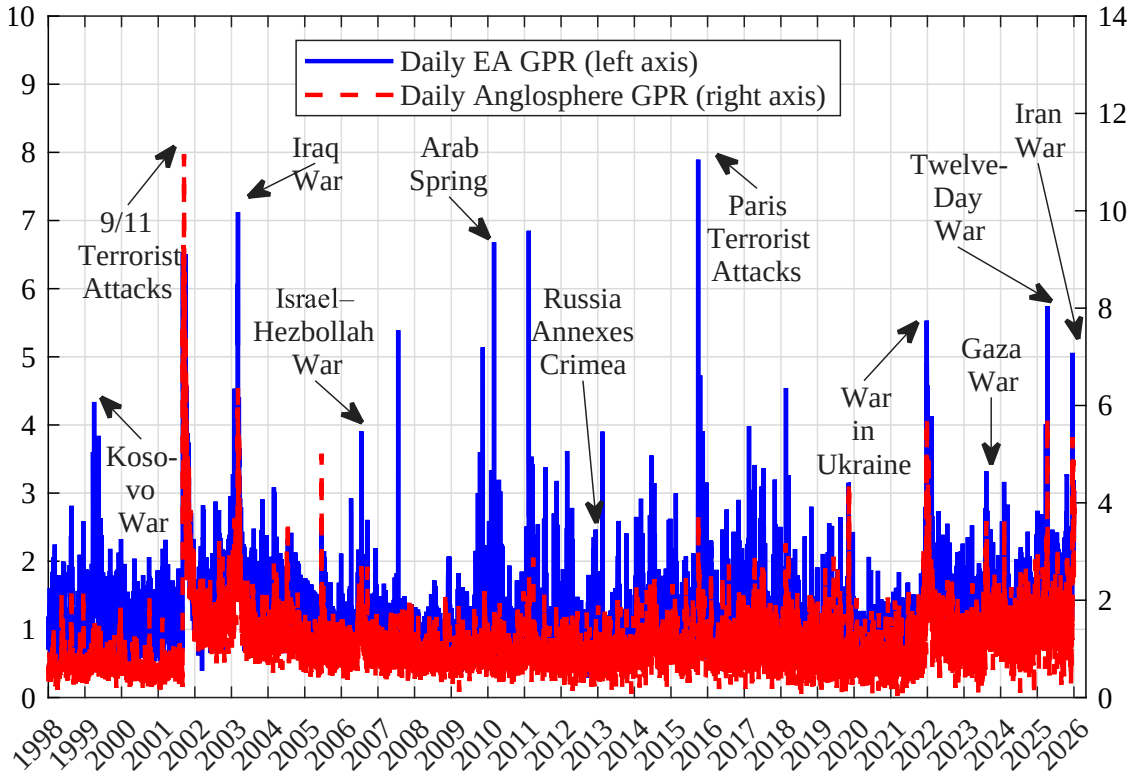

Figure 3: Geopolitical risk index at daily frequency: Euro area and Anglosphere

Notes: The daily EA-GPR index is an aggregate of four country-level GPR indices based on local newspapers in the respective languages. The Anglosphere Daily GPR index from Caldara and Iacoviello (2022) is a text-based measure using English-language newspapers. For comparability, both indices are normalized to equal 1 (on average) in January 2010. The two series are plotted on separate axes to enhance the readability of each series.

Daily EA GPR. In addition to the monthly index, we also construct a daily EA GPR measure. While Caldara and Iacoviello (2022) provide a daily Anglosphere benchmark, our measure captures higher-frequency fluctuations in geopolitical risk from a euro area perspective. The daily index uses the same conceptual framework and search strategy as the monthly series, but not the same underlying newspaper database. Instead, it is constructed from Factiva Analytics, because the broader Factiva database used for the monthly index cannot be used to construct daily indicators. Our daily country-level indices are also aggregated using GDP weights. However, owing to limited and uneven source coverage in the Dutch series at the daily frequency, the Netherlands is excluded from the construction of the daily aggregate.

As a validation exercise, we aggregate the daily index to the monthly frequency and compare it with our monthly EA GPR series, which shows strong consistency between the two measures. Further details on the data sources, construction procedure, and robustness checks are provided in Appendix D.

Figure 3 compares the daily EA GPR index with the daily Anglosphere GPR measure of Caldara and Iacoviello (2022). Both series closely track major geopolitical events, but differ in magnitude and persistence. In particular, the euro area index responds more strongly to

conflicts that are geographically closer to Europe, most notably the war in Ukraine, after which geopolitical risk remains persistently elevated. Overall, the daily evidence confirms that differences between European and Anglosphere risk perceptions are also visible at high frequency and are closely linked to the proximity and perceived intensity of geopolitical events.

European Union GPR. We also construct an additional measure of geopolitical risk for the European Union, denoted as EU GPR. This measure is useful when the focus shifts from the euro area to the broader EU aggregate. While the EA GPR and EU GPR indices are naturally closely related, the distinction matters conceptually. For the euro area, restricting attention to the five largest member states (Germany, France, Italy, Spain, and the Netherlands) implies only a limited omission of the eastern flank, as the eastern euro area economies account for only a small share of total euro area GDP. For the EU, however, this argument is less compelling, since Poland is the sixth largest economy in the Union and thus makes eastern-flank exposure economically relevant for any EU GPR index.

For this reason, we construct the EU GPR series by extending our original set of five countries to include Poland. This allows the EU measure to capture geopolitical risk perceptions from a more exposed eastern-flank economy while maintaining sufficiently long and reliable newspaper coverage. We follow the same procedure as before, using translated search queries and aggregating the local indices with GDP weights. Details on the selected newspapers and search queries are provided in Appendix E.

The resulting EU GPR index aligns closely with the EA GPR measure, as reflected in a correlation of $\rho = 0.996$ and exhibits a very similar overall level, as shown in Figure E.1 in Appendix E. At the same time, the EU GPR index is somewhat higher from 2022 onwards due to the war in Ukraine, which is consistent with Poland's greater exposure to the conflict. Overall, the results indicate that the baseline EA GPR index provides a good proxy for the geopolitical risk at the EU level.

3 Geopolitical risk: Euro area perspective matters

We now investigate in more detail how geopolitical risk shocks transmit to the euro area economy. To this end, we estimate a monthly vector autoregression (VAR) model for the sample period from January 1998 through December 2025, the period for which all macro-financial data are available. We use this framework to compare the effects of EA GPR shocks on the euro area with those of the Anglosphere GPR shock. We also provide a 'No-War' counterfactual analysis of the major escalation of the war in Ukraine in 2022 to quantify its macroeconomic costs. Furthermore, we conduct structural scenario analyses to assess euro area prospects from April 2026 onward under alternative paths for geopolitical risk amid the recent conflicts in the Middle East.

3.1 Method: Bayesian VAR with truncated COVID-19 pandemic correction

We estimate a Bayesian VAR with a truncated COVID-19 volatility correction to assess the impact of GPR shocks. This approach allows us to exploit the full sample, including the period of the Russia-Ukraine conflict since the annexation of Crimea in 2014. The COVID-19 pandemic generated unprecedented volatility in macroeconomic time series, and a growing body of research shows that these extreme observations can distort VAR-based analyses, including both structural inference and forecasting; see, among others, Lenza and Primiceri (2022), Carriero et al. (2024), Hartwig (2024), and Schorfheide and Song (2024).

To address this, we adopt a parsimonious correction that mitigates the influence of pandemic-era outliers while maintaining comparability to previous studies that use standard homoskedastic VAR frameworks. Specifically, we follow Lenza and Primiceri (2022) and rescale the covariance matrix for observations within the pandemic period.[8] This variance correction attenuates the disproportionate impact of the pandemic's volatility spikes while preserving the underlying information relevant for inference.

We estimate a VAR of the form

$$y_t = C + \sum_{l=1}^{p} B_l y_{t-l} + s_t \varepsilon_t, \quad \text{with} \quad \varepsilon_t \sim N(0, \Sigma),$$

where y_t is an $n \times 1$ vector of endogenous variables at time $t = 1, \ldots, T$, C a vector of constants, B_l coefficient matrices of size $n \times n$, and ε_t an $n \times 1$ vector of reduced form residuals. The auxiliary variable s_t scales the residual covariance matrix and takes a value of 1 prior to the pandemic. From the onset of the pandemic, denoted as t^*, the model then assumes that $s_{t^*} = \bar{s}_0$, $s_{t^*+1} = \bar{s}_1$, $s_{t^*+2} = \bar{s}_2$, and

$$s_{t^*+j} = 1 + (\bar{s}_2 - 1)\rho^{j-2},$$

where $[\bar{s}_0, \bar{s}_1, \bar{s}_2, \rho]$ is a vector of the unknown coefficients of the covariance adjustment.

A key concern in our setting is that an unrestricted volatility correction may downweight observations after the Russian invasion of Ukraine. In particular, the decay parameter ρ determines how quickly the volatility scaling reverts to unity. Under a standard specification, the posterior of ρ implies that the correction remains active well into 2022 and 2023, a period that is important to our analysis.

Accordingly, we impose a truncation on the volatility adjustment by setting $s_t = 1$ for all t beyond 18 months after the onset of the pandemic (i.e., from October 2021 onward). This ensures that observations from the invasion period onward are no longer downweighted in

[8] An alternative approach would be to simply omit the extreme observations associated with the onset of the pandemic, specifically March, April, and May 2020. However, for the analysis of GPR shocks, excluding these months is particularly problematic, as they precede the Russian invasion of Ukraine and can contain valuable pre-crisis information.

the likelihood, preserving the identifying variation in GPR that is relevant to our analysis.[9]

For estimation, we use prior distributions for the VAR coefficients of the conjugate Normal-Inverse Wishart type, defined through a set of hyperparameters. In particular, we employ the standard Minnesota prior (Litterman, 1986), but relax the assumption of a random walk for the GPR indicator by setting the first lag to 0.8. As a prior for $\bar{s}_0$, $\bar{s}_1$, and $\bar{s}_2$, we assume a Pareto distribution with scale and shape equal to 1. Such a specification allows for potentially large increases in the reduced form residuals over the pandemic. For ρ, the model imposes a Beta prior, which we calibrate to the standard values proposed. p, the lag length, is set to 12. Similarly, impulse responses are computed over a 12-month horizon, and we report median estimates together with 68% confidence bands derived from the posterior distribution.

Finally, we identify structural shocks using a recursive ordering scheme based on the Cholesky decomposition of the reduced-form covariance matrix. The EA GPR index is ordered first. This implies that innovations to geopolitical risk can contemporaneously affect all other macro-financial variables, whereas the latter respond only with a lag.

Conceptually, this corresponds to the internal-instrument approach of Plagborg-Møller and Wolf (2021), in which an externally constructed shock proxy is included in the VAR and ordered first. Because the EA GPR index is built from automated newspaper text searches based on keyword lists, its high-frequency variation is plausibly predetermined with respect to macroeconomic conditions within the period. Put differently, our identification relies on the standard timing assumption that innovations in the GPR proxy are orthogonal to other macroeconomic shocks, so that the series can be used as a proxy (internal instrument) for geopolitical risk shocks within the VAR. This ordering and interpretation are also common in the geopolitical risk literature, facilitating interpretability and comparability of the resulting shock series.

3.2 Data

Our data span January 1998 to December 2025, beginning one year before the launch of the euro. We use a set of monthly macroeconomic and financial variables to capture the transmission of geopolitical risk shocks to the euro area economy. The baseline specification includes six variables in addition to our EA GPR indicator.

Real economic activity is measured by euro area industrial production. For prices, we include the harmonized index of consumer prices (HICP) and its core counterpart excluding food, energy, tobacco, and alcohol. The monetary policy stance is measured by the ECB main refinancing operations (MRO) rate; for 1998, we use the Bundesbank's repo allotment rate, while for the period covered by Wu and Xia (2017), we instead use the euro area shadow rate. Equity prices are measured by the Euro Stoxx 600, and we include residential

[9]Under this specification, the posterior median of ρ is 0.83, indicating that the correction still captures the gradual normalization of volatility during the pandemic period.

property prices.

Equity and house prices are deflated using the HICP. All variables are seasonally adjusted and log-transformed where appropriate. Quarterly house prices are interpolated to monthly frequency using a cubic spline. Appendix F provides further details on definitions, transformations, and data sources.

3.3 Transmission of geopolitical risk shocks

Figure 4 displays the transmission of EA GPR shocks in the euro area over a 12-month horizon for industrial production (IP), broad and core consumer prices (CPI and Core CPI), and the interest rate (IR). Solid lines show the median responses, while the shaded areas mark the 68% credible intervals. Appendix G contains the complete set of impulse responses.

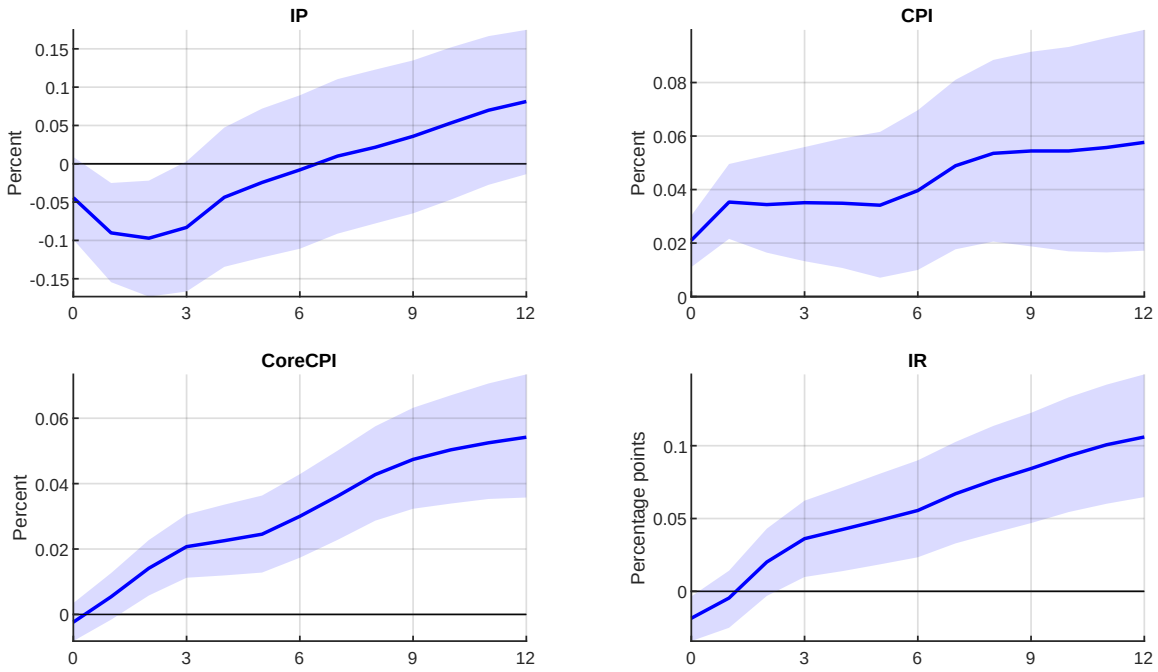

Figure 4: Impact of euro area geopolitical risk shocks on euro area economy

Notes: Impulse responses based on two Bayesian vector autoregressions (VAR) with Cholesky identification. The VAR uses the EA GPR index, which is ordered first in their respective VAR models. Solid lines denote median and shaded areas the corresponding 68% credible intervals.

We find that geopolitical risk shocks have significant adverse effects on the euro area economy. The peak impact on output for a one-standard-deviation shock is a fall by 0.1% in IP after two months. The GPR shock also results in inflationary pressure. There is a strong and persistent increase in consumer prices following the shock, with the CPI and Core CPI going up by about 0.06% and about 0.05% one year after the event.

This combination of falling output and rising prices is consistent with historical evidence that wars act as adverse supply shocks, causing economic activity to contract amid strong inflationary pressure, see Federle et al. (2024). The policy rate also increases as a result, three months after the shock, indicating that monetary policy responds to the increase in

inflation, at least partially. This significant rise in prices explains the positive response of the interest rate, which reflects a monetary policy tightening by the European Central Bank.[10]

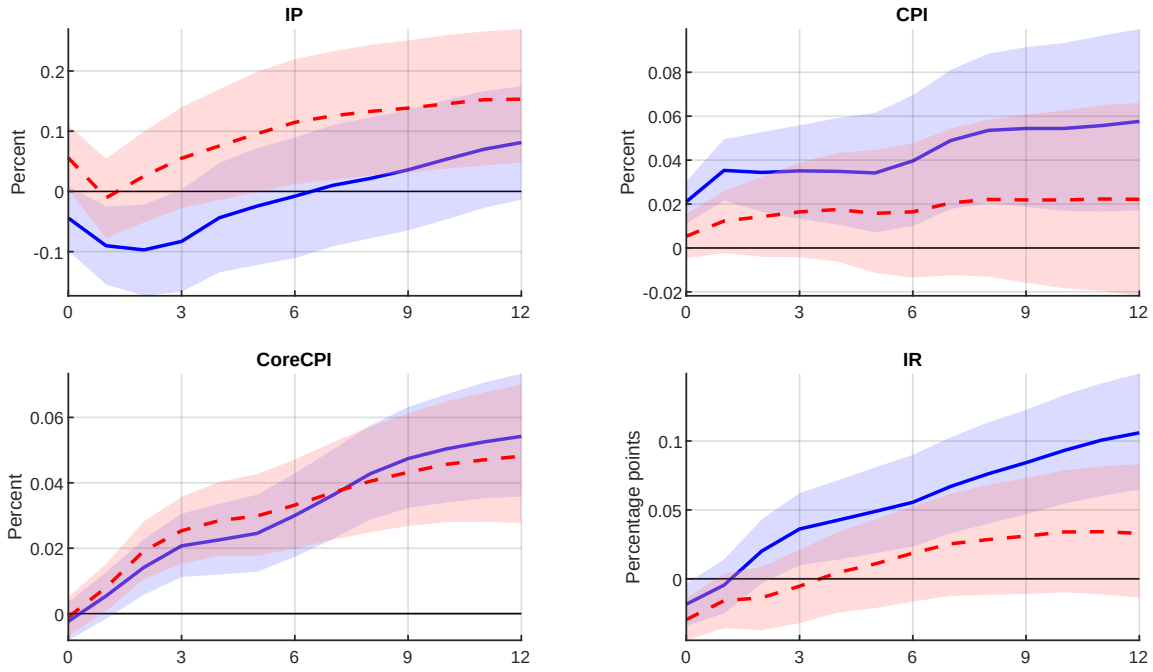

Figure 5: Impact of euro area (blue solid line) and Anglosphere (red dashed line) geopolitical risk shocks on euro area economy

Notes: Impulse responses based on two Bayesian vector autoregressions (VAR) with Cholesky identification. The first VAR uses the EA GPR index and the second VAR the Anglosphere GPR index as provided by Caldara and Iacoviello (2022), which both are ordered first in their respective VAR models. Solid and dashed lines denote median and shaded areas the corresponding 68% credible intervals.

As a next step, we analyze the implications of explicitly accounting for the euro area perspective for the transmission of the shock. In Figure 5, we compare the euro area impact of an EA GPR shock to the one of an Anglosphere GPR shock (red dashed line) as identified through the measure provided by Caldara and Iacoviello (2022). Although the responses may appear broadly similar at first glance, important differences arise in terms of statistical significance and overall effects. In particular, the immediate responses of industrial production and broad CPI are no longer statistically significant when the GPR shock is identified using the Anglosphere index. Industrial production even turns positive around six months after the shock, while broad CPI remains statistically insignificant throughout. Core prices still rise significantly, but somewhat less strongly than under the euro area identification. The monetary policy response is correspondingly weaker: following a small initial decline on impact, the interest rate response becomes statistically insignificant. Overall, this pattern is less consistent with the standard interpretation of a geopolitical risk shock as generating stagflationary pressure in the euro area.

[10]In related work, Fecht et al. (2026) show that lending rates rise significantly as the geopolitical shock propagates through the banking sector - even before monetary policy responds.

For this analysis, we use the GPR measure by Caldara and Iacoviello (2022). Importantly, our findings and takeaways are also robust to using the equivalent measure constructed from the Factiva database. The results for this case are shown in Appendix G. This exercise confirms that observed differences reflect genuine heterogeneity in risk perception, rather than structural features of the datasets.

Overall, the key message of this section is that EA GPR shocks have significant contractionary and inflationary effects in the euro area – effects that we would not see if our estimations relied solely on a GPR indicator based on English-language newspaper text.

Next, we zoom in on the start of the war in Ukraine via a 'No-War' counterfactual. This counterfactual exercise helps to place the economic magnitude of euro area geopolitical risk shocks into perspective: while the one-standard-deviation shocks analyzed above establish statistical significance, the onset of the war in Ukraine provides an economically meaningful benchmark for the size and propagation of large, real-world geopolitical shocks.

3.4 'No-War' counterfactual

In this section, we compute a 'No-War' counterfactual in which the EA GPR index is held fixed at its December 2021 level through June 2022. This removes the sharp and persistent rise in geopolitical risk that coincided with the Russian invasion of Ukraine. Operationally, we impose a flat path on the GPR index and allow the identified GPR structural shock to adjust endogenously so that the VAR reproduces this counterfactual trajectory (see, e.g., Waggoner and Zha (1999); Sims and Zha (2006); Hubrich et al. (2026)).

Figure 6 reports the results of this analysis. The top-left panel shows the actual GPR path (solid line) and the counterfactual path (orange dashed line). The remaining left panels compare the evolution of the actual macroeconomic variables (solid line) to their counterfactual path. Given the Bayesian estimation framework, this procedure yields a full posterior distribution of counterfactual paths for all macroeconomic variables. Orange dashed lines mark median outcomes and orange shaded areas mark the 68% credible intervals.

We interpret the resulting counterfactual as the macroeconomic baseline that would have prevailed *absent* the surge in geopolitical risk. To quantify the economic impact of the invasion, we compute a War vs. 'No-War' path difference, defined as the deviation of the actual data from the corresponding 'No-War' counterfactual. This comparison allows us to isolate the contribution of the rise in geopolitical risk due to the geopolitical risk shock, holding fixed all other structural innovations implied by the VAR. We report this exercise in the right panel of Figure 6, where the green solid lines denote the median differences and the green shaded areas are the corresponding 68% credible intervals.

Relative to the 'No-War' counterfactual, industrial production is about 1.3% lower in May 2022. This gap is economically sizable. For comparison, observed year-on-year industrial production growth in December 2022 was about 1.1%. A level difference of 1.3% is therefore large relative to the magnitude of industrial production growth observed over 2022.

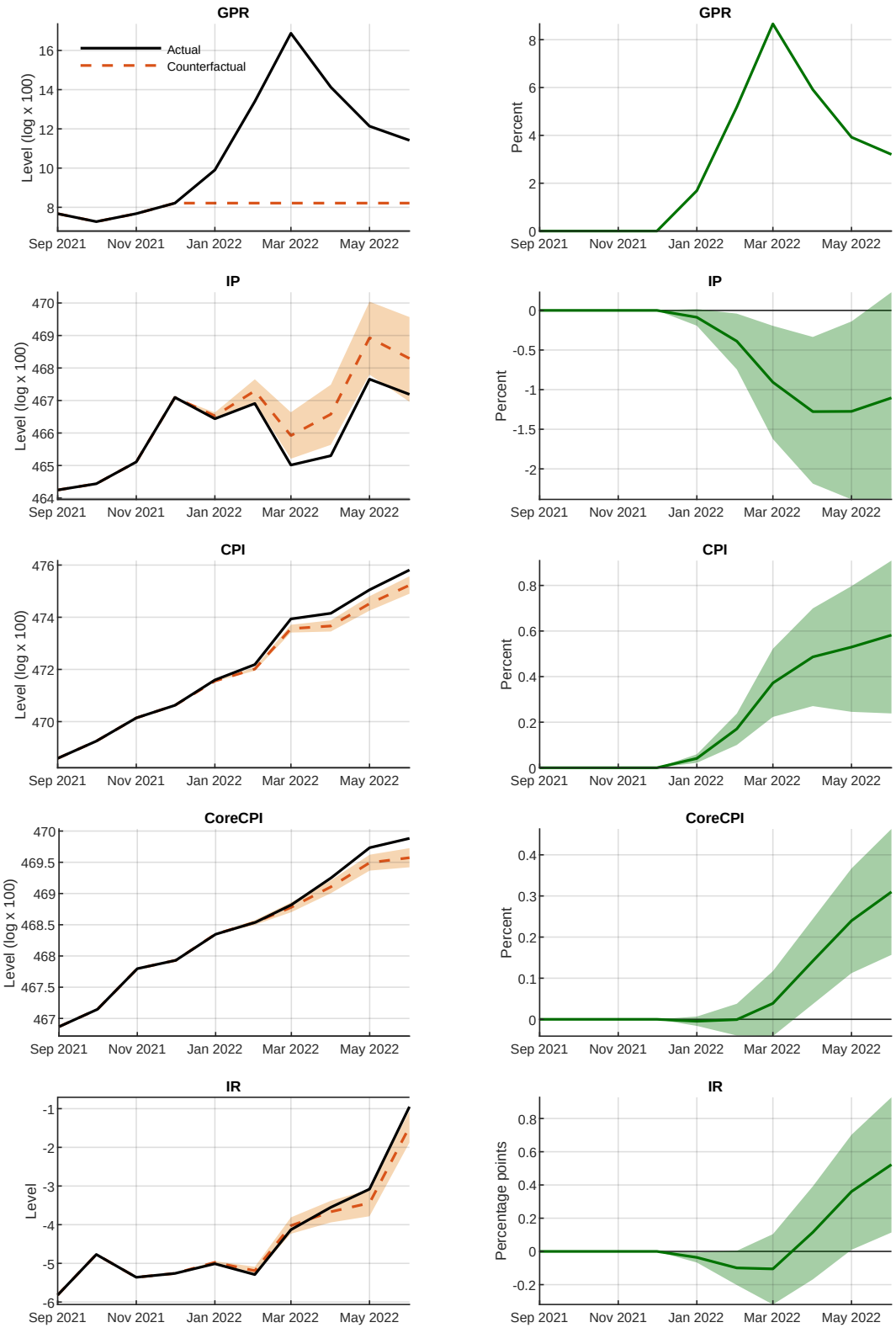

Figure 6: Left panel: 'No-War' counterfactual path of GPR: original data (solid line) and counterfactual data (orange dashed line); Right panel: War vs. 'No-War' path difference

Notes: Left panel shows the original data and the counterfactual path of the GPR index, assuming constant levels as of December 2021, achieved by adjusting the GPR shock. Right panel gives the deviation of the actual data minus the counterfactual data. The counterfactual data are based on a Bayesian vector autoregression (VAR) with Cholesky identification, ordering the EA GPR index first. Shaded areas denote the 68% credible intervals.

Broad CPI is about 0.6% higher and core CPI about 0.3% higher by June 2022 relative to the 'No-War' counterfactual.[11] Although these counterfactual price gaps are smaller than the corresponding effect on IP, this likely reflects in part the more gradual transmission of geopolitical risk shocks to prices. In particular, price pressures build over time, especially for core inflation, rather than being concentrated at the onset of the war. This pattern is consistent with the impulse response evidence in Figure 5, which points to a delayed inflation response following a geopolitical risk shock. The same timing difference is visible in the realized inflation data: broad CPI inflation peaks earlier, at 10.1% in October 2022, and then starts to decline, whereas core inflation rises more gradually and remains elevated for longer, reaching 5.5% in March 2023.

The policy rate responds with a delay, becoming significantly higher than in the 'No-War' counterfactual in May 2022 and reaching a gap of about 0.5 percentage points by June 2022.

Taken together, these results point to sizable and rapidly transmitted macroeconomic effects in the early phase of the invasion, consistent with heightened uncertainty, weaker expectations, and supply-side pressures.[12] We now turn to euro area prospects amid the recent conflicts in the Middle East.

3.5 Middle East conflicts and euro area prospects

The Middle East conflicts have escalated sharply since late February 2026, with direct US and Israeli military action against Iran pushing our EA GPR index to elevated levels. This end-of-sample escalation episode provides a natural application for forward-looking structural scenario analysis (see, e.g., Waggoner and Zha (1999); Leeper and Zha (2003); Baumeister and Kilian (2014); Antolín-Díaz et al. (2021)): policymakers and analysts face genuine uncertainty about the conflict's trajectory, and quantifying the macroeconomic implications of alternative de-escalation paths is therefore of immediate policy relevance.[13]

A practical complication, however, is that our macro-financial dataset exhibits a ragged edge at the end of the sample. At the time of writing, the GPR index, the interest rate, and nominal equity prices are available through March 2026; broad consumer prices through February 2026; industrial production and core consumer prices through January 2026; and residential property prices only through December 2025. This data structure rules out a clean common forecast origin: ignoring the latest observations would discard precisely the high-frequency information that is most informative during the recent escalation, while treating the incomplete quarter as fully observed would be equally unsatisfactory.

To handle the ragged edge, we extend the structural scenario framework of Antolín-Díaz et al. (2021) by replacing the fully observed end-of-sample state with a nowcast distribution

[11] Higher inflation expectations may contribute via second-round effects (e.g., Boeck and Zörner, 2025).

[12] Additional results of this exercise are reported in Appendix G.

[13] Scenario analysis is increasingly used to assess the implications of specific risks, such as by central banks (Bell et al., 2026).

inferred from the incomplete information available at the time of writing. Specifically, we nowcast the missing January–March 2026 observations conditional on the monthly indicators already released, and use the resulting distribution over the end-March 2026 state as the initial condition for structural scenario analysis. This procedure propagates uncertainty from three sources into the scenario bands: posterior uncertainty about VAR parameters, nowcast uncertainty about the end-of-sample state, and future shock uncertainty over the scenario horizon.

In the structural scenario analysis, we then consider different de-escalation trajectories. Specifically, conditional on the nowcast state, we impose different structural scenarios for the GPR index from April 2026 onward, attributing the entire scenario path exclusively to the EA GPR shock. Non-driving shocks retain their unconditional distribution throughout the scenario horizon.

Our baseline scenario assumes gradual de-escalation, with the EA GPR index declining by 5% per month from its March 2026 level; see Figure 7.[14] The solid black lines show observed data, the gray dashed lines indicate nowcasted observations, and the orange dashed lines denote the structural scenario period. To facilitate interpretation, all log-level variables are rebased to 100 in March 2026. The Kullback–Leibler plausibility metric of Antolín-Díaz et al. (2021), with a median value of $q = 0.66$, indicates that the imposed scenario remains a moderate and empirically plausible deviation from the unconditional distribution of GPR shocks.

Under this baseline gradual de-escalation scenario, the median path of industrial production increases gradually to around 0.5% above its March 2026 level by September 2026. Headline and core consumer prices also edge up, with median paths reaching around 0.27% by September 2026. By contrast, the policy rate shows little systematic adjustment over the scenario horizon, with the median ending close to its March level and credibility bands spanning both sides of the baseline. Overall, the scenario is associated with a median path featuring modest increases in real activity and prices, while the interest rate path remains broadly unchanged.

We next consider two alternative scenarios relative to the baseline gradual de-escalation scenario; see Figure 8. The red dashed line shows the deviation of an 'escalation' scenario, in which the EA GPR index remains at its March 2026 level throughout the scenario horizon ($q = 0.86$). The blue dashed line shows the deviation of the 'fast de-escalation' scenario, in which the EA GPR index returns immediately to its unconditional mean in April 2026 and remains there thereafter ($q = 0.89$). Although both scenarios are less plausible than the baseline under the model, they remain well within the range of policy-relevant contingencies for assessing the sensitivity of the euro area outlook to geopolitical risk. Their elevated plausibility metrics reflect the historically unusual nature of both a sustained period at the March 2026 level and an immediate return of the GPR index to its unconditional mean.

Because non-driving shocks retain the same unconditional distribution across scenarios,

[14] For the complete set of results of this section, please see Appendix H.

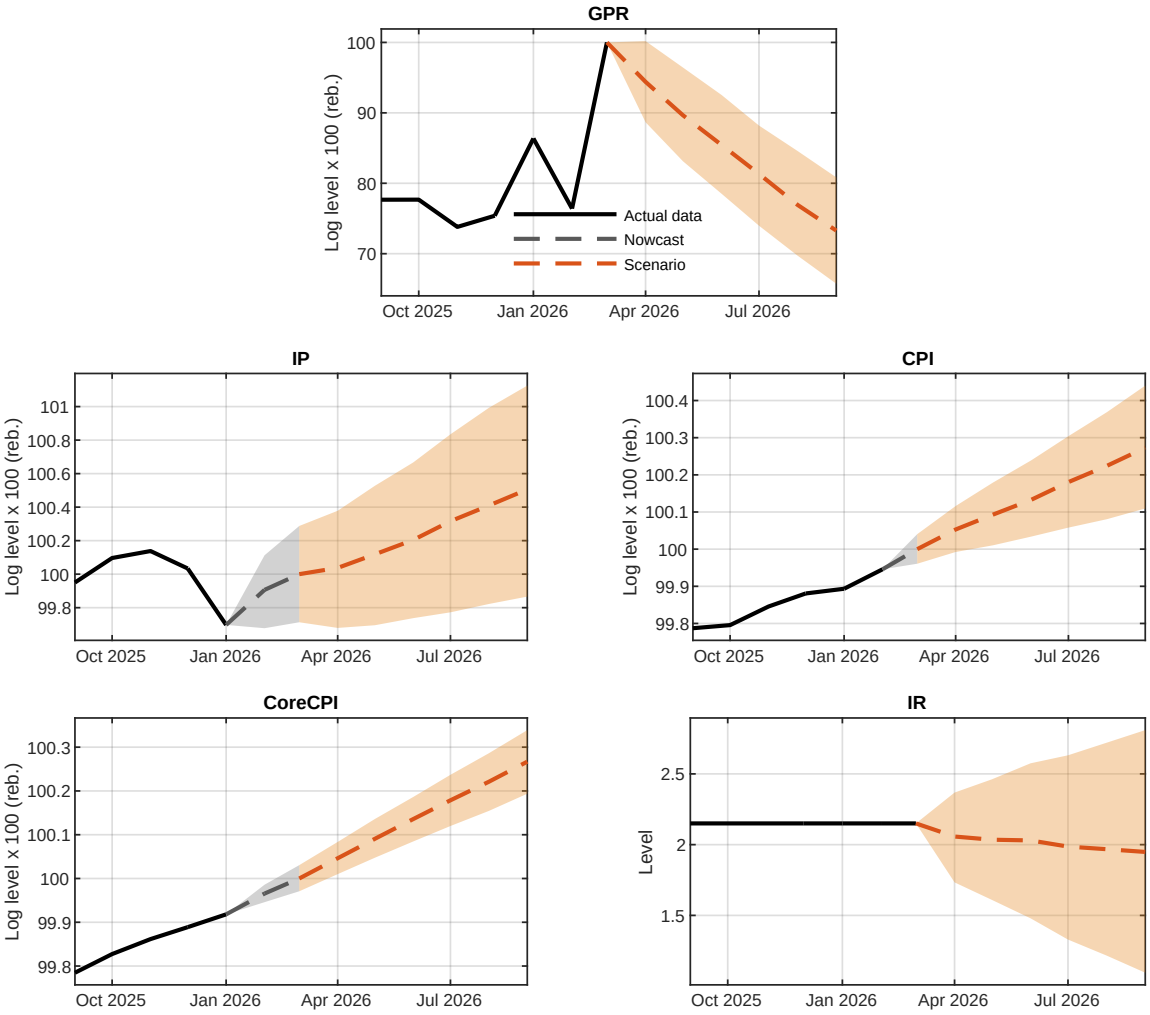

Figure 7: Baseline structural scenario: gradual geopolitical de-escalation

Notes: The figure reports an extended structural scenario analysis based on Antolín-Díaz et al. (2021). The scenario assumes that the EA GPR index declines by 5% per month from its March 2026 level. Solid black lines show observed data, gray dashed lines show nowcasted observations for variables unavailable at the time of writing, and orange dashed lines show the structural scenario path conditional on the nowcast distribution for the end-March 2026 state. Variables in log-levels are rebased to 100 in March 2026. Shaded areas denote 68% credible bands.

the comparison isolates the importance of alternative paths for the driving geopolitical risk shock. The scenario comparison shows that the euro area outlook is highly sensitive to these alternative shock paths, which generate materially different trajectories for industrial production, prices, and the policy rate even over a six-month horizon.

Relative to the baseline, the escalation scenario is associated with weaker industrial production, somewhat higher prices, and a slightly higher policy rate, whereas the fast de-escalation scenario is associated with stronger industrial production, lower prices, and a lower policy rate. By the end of the six-month horizon, industrial production is about 0.71% lower under escalation and about 0.74% higher under fast de-escalation relative to the baseline. Headline prices are around 0.3% higher under escalation and 0.5% lower under fast de-escalation, while core prices are about 0.1% higher under escalation and 0.3% lower

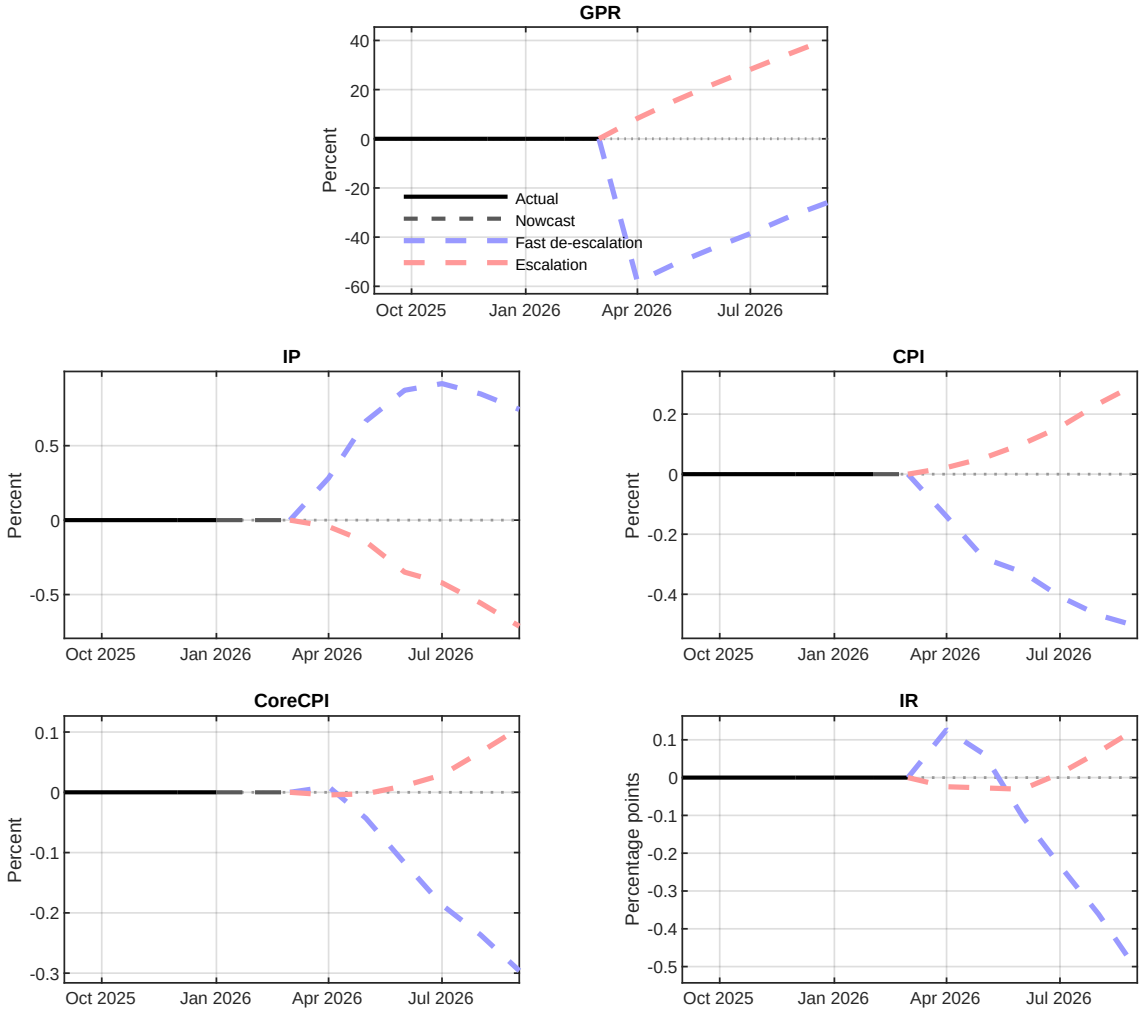

Figure 8: Alternative geopolitical risk scenarios relative to the baseline

Notes: The figure reports deviations of the median paths under two alternative structural scenarios from the median path under the baseline gradual de-escalation scenario. The dashed blue line corresponds to the fast de-escalation scenario, in which the EA GPR index returns immediately to its unconditional mean in April 2026. The dashed red line corresponds to the escalation scenario, in which the EA GPR index remains at its March 2026 level throughout the scenario horizon.

under fast de-escalation. The corresponding policy rate differences amount to roughly +0.13 and −0.5 percentage points, respectively.

4 Consequences of GPR: sanctions and shortages

In the previous section, we provided evidence that geopolitical risk shocks generate a combination of falling output and rising prices, suggesting a supply-side contraction. Such pattern is also consistent with mechanisms typically associated with geopolitical risk. Geopolitical risks often trigger economic sanctions and can lead to shortages or supply disruptions, for instance, through damaged infrastructure, disrupted trade routes, or precautionary stockpiling. Motivated by this observation, we now examine two transmission channels through which geopolitical risk shocks may affect the macroeconomy: (i) the sanctions channel, and

(ii) the shortages channel.

4.1 Sanctions

Sanctions are used by a 'sender' country to restrict or prohibit specific economic activities with a 'target' country with the aim of influencing its actions.[15] The sender country restricts economic relations with the target for a particular purpose, e.g. to end or prevent war. However, the sanctions can have unintended adverse effects on the sender's own economy, as e.g. Besedeš et al. (2021) and Bachmann et al. (2024) highlight. In addition, the target country may impose retaliatory sanctions that could hurt the original sender country. Thus, the impact of geopolitical risk on the euro area could be driven in part by sanctions.

A sanctions indicator for the euro area. To assess whether geopolitical risk shocks propagate through a 'sanctions channel', we develop a news-based sanctions intensity index for the euro area, and we also develop a similar index from an Anglosphere perspective. In doing so, we build on the work of Laudati and Pesaran (2023) and Bondarenko et al. (2024), who have developed such a sanctions indicator for Iran and Russia, respectively. In particular, we construct a monthly sanctions indicator using the same countries and same local newspapers that underlie our EA GPR index and the Anglosphere GPR index, respectively. We measure how often terms related to sanctions are mentioned in connection to either Russia, Syria, Iran, North Korea, Venezuela or Belarus. Target country names are included to restrict the search to international sanctions rather than unrelated domestic uses of the term (e.g., labor market penalties). Details on the search queries for the different countries can be found in Appendix I. Notice that our search query entertains a broad definition of economic sanctions; it does not distinguish between financial sanctions, trade sanctions, travel restrictions and other kinds of sanctions.

Figure 9 presents the EA GPR index alongside the EA sanctions index over time. Note that until March 2014, when Russia annexed Crimea, the EA sanctions index remains muted. The index hovers around zero, indicating that sanctions were not actively used as a policy tool to punish target countries or to respond to geopolitical tensions. After March 2014, however, the EA sanctions index became more prominent.

Figure 10 shows that the sanctions indices constructed from euro area newspapers and from English-language sources, respectively, are strongly correlated.[16] At the two major peaks, in 2014 and 2022, the euro area index exhibits slightly higher intensity. This is natural, as European media tend to devote greater attention to sanctions imposed on Russia, a neighboring country with direct geopolitical and economic relevance for the region.

A key advantage of our newspaper-based sanctions intensity indicator is its high-frequency

[15] Eaton and Engers (1992) discuss how the toughness of the sender country and target country shape the success of sanctions.

[16] The sanctions intensity index by country is shown in Appendix K.

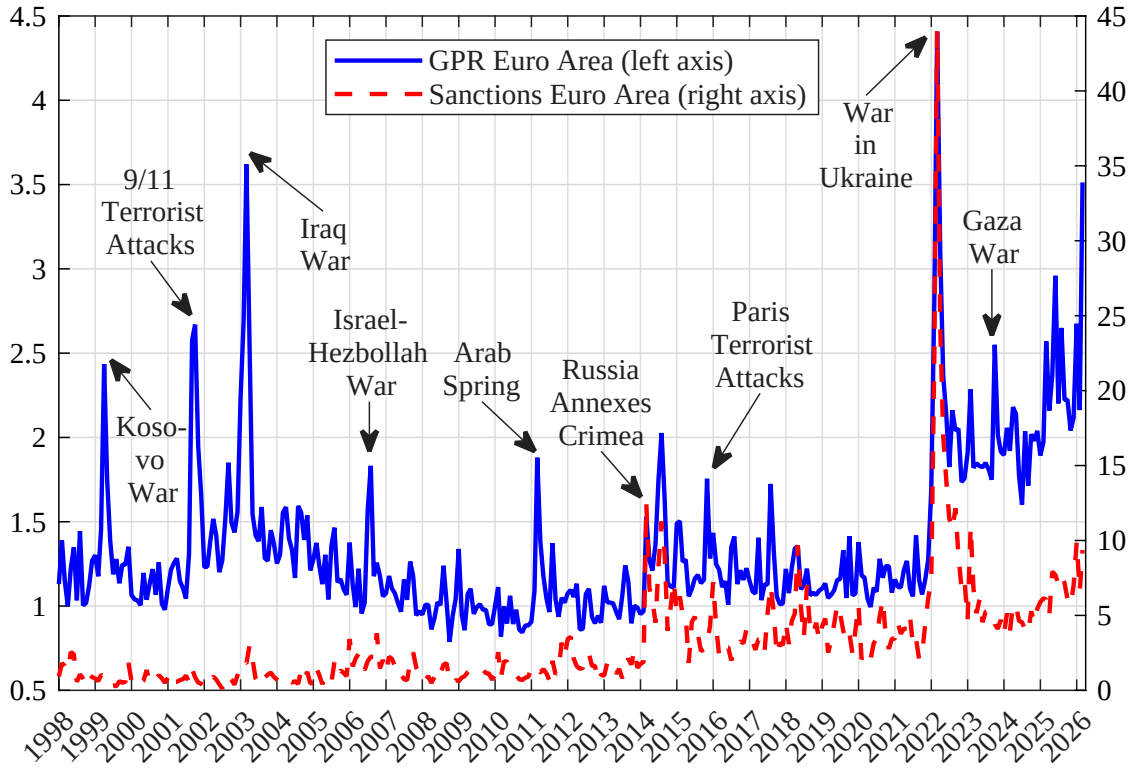

Figure 9: Euro Area Geopolitical Risk and Sanctions Intensity Indices

Notes: Sanctions intensity index is a news-based measure following Laudati and Pesaran (2023). Both indices have been rescaled to equal unity in January 2010.

time series structure, which makes it directly usable within our VAR framework.[17] Moreover, newspaper coverage reflects not only the direct imposition of sanctions but also the indirect economic consequences arising from firms' efforts to adjust, circumvent, or anticipate these measures. Because such adjustment costs accumulate over time, our index provides a proxy for the time-varying intensity of sanctions. Importantly, it also captures the threat of future sanctions: firms and financial markets often react to the expectation of sanctions well before they are formally enacted.

The sanctions channel of geopolitical risk. How important are sanctions for the transmission of geopolitical risk shocks to the euro area economy? To answer this question, we carry out a counterfactual exercise with our baseline VAR, additionally including our newly constructed euro area sanctions intensity index. While Bondarenko et al. (2024) show that the sanctions channel is an important driver of the inflation response to geopolitical risk shocks in Russia, it is important to note that Russia has been a sanctions target, whereas the euro area is rather a sender country. The sanctions channel of GPR may well differ fundamentally between target countries and sender countries.

[17] An alternative data source on sanctions is the Global Sanctions Database (Syropoulos et al., 2024), which documents sanction episodes together with information on senders, targets, and sanction types. While well suited for event study analysis, its lower frequency and episodic structure make it less compatible with the monthly VAR approach used here.

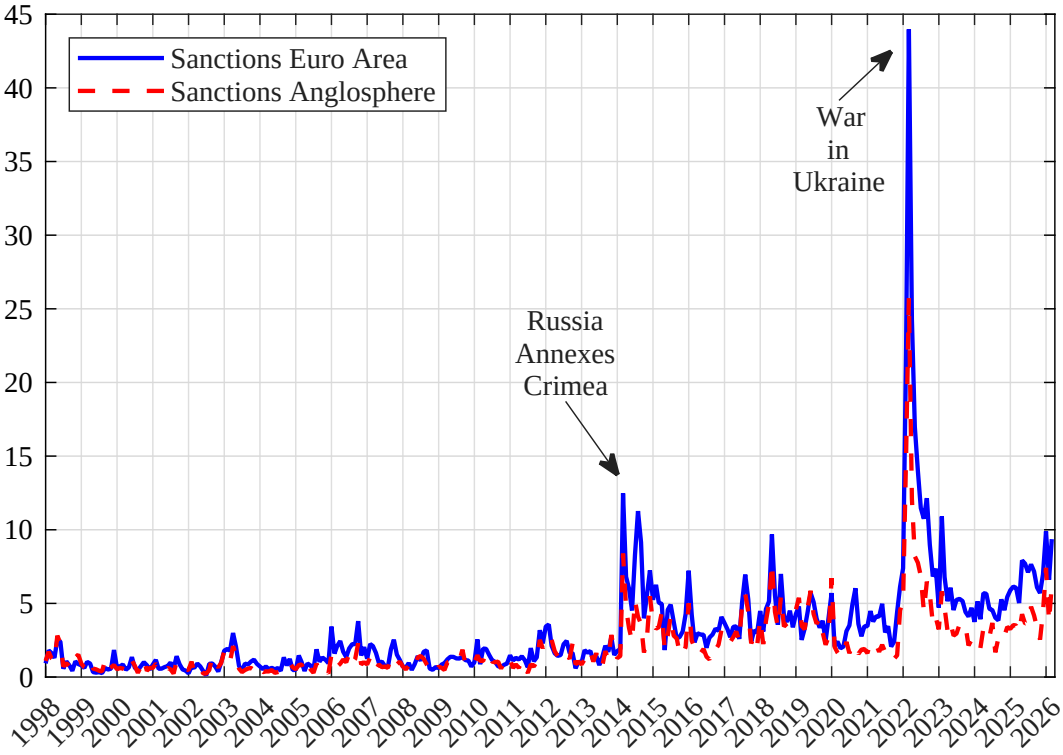

Figure 10: Euro Area and Anglosphere Sanctions Intensity Index

Notes: Sanctions intensity indices are news-based measures following Laudati and Pesaran (2023). Both indices have been rescaled to equal unity in January 2010.

To assess the role of sanctions, we modify the estimated VAR system ex post in a way that removes any transmission from the geopolitical risk shock to the sanctions intensity index. Concretely, we overwrite the contemporaneous mapping in the Cholesky factor so that a geopolitical risk shock no longer feeds into sanctions on impact. In addition, we suppress all dynamic feedback into the sanctions variable (also from other variables) by zeroing out the relevant lag coefficients. These adjustments effectively isolate the sanctions channel within the estimated structure of the VAR. That said, the counterfactual holds agents' behavioral relationships fixed and therefore abstracts from possible adjustments in private or policy decisions under an alternative sanctions regime, which makes the exercise subject to the Lucas critique.

Figure 11 shows that our results are broadly similar whether the sanctions channel is active or shut down.[18] In particular, the response of IP to a geopolitical risk shock remains very similar across specifications. If anything, the output response is slightly less adverse when the sanctions channel is active, although the difference is small. This suggests that the sanctions channel does not materially amplify the real effects of geopolitical risk shocks on industrial production in the euro area.

Similarly, only minor differences arise for prices and interest rates. If anything, shutting down the sanctions channel is associated with slightly stronger responses of headline and

[18] Appendix K contains the complete set of results.

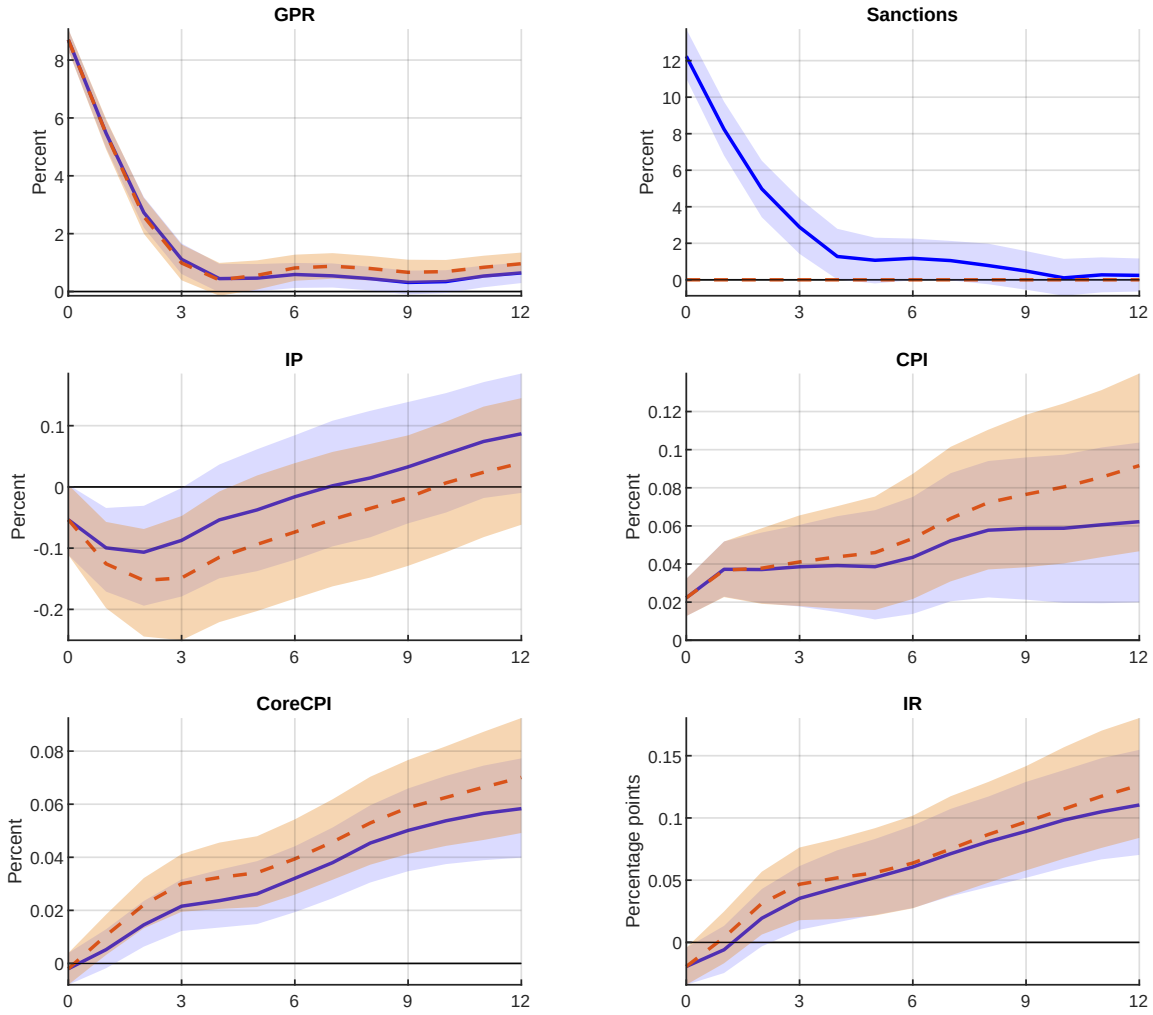

Figure 11: Impact of EA GPR shock with sanctions channel: active (blue solid line) and non-active (orange dashed line)

Notes: Impulse responses based on Bayesian vector autoregression (VAR) with Cholesky identification. The VAR uses the EA GPR index and the EA sanctions intensity index. Shaded areas denote 68% credible intervals.

core prices, while the policy rate response remains broadly unchanged across specifications. Quantitatively, however, these differences are small and provide no indication that the sanctions channel systematically worsens euro area macroeconomic outcomes. This is consistent with the broad consensus that the direct economic effects of sanctions on sender countries are limited (Bayard et al., 1983; Farmer, 2000; Besedeš et al., 2021).

4.2 Shortages

The escalation of geopolitical tensions may lead to supply shortages primarily through a disruption in trade linkages. For instance, Fernández-Villaverde et al. (2024) document increased trade fragmentation, and Tenreyro et al. (2024) analyze the consequences of fragmentation for inflation and monetary policy responses. Khalil et al. (2025) empirically show that geopolitical risk shocks reduce import volumes and raise import prices both in the US

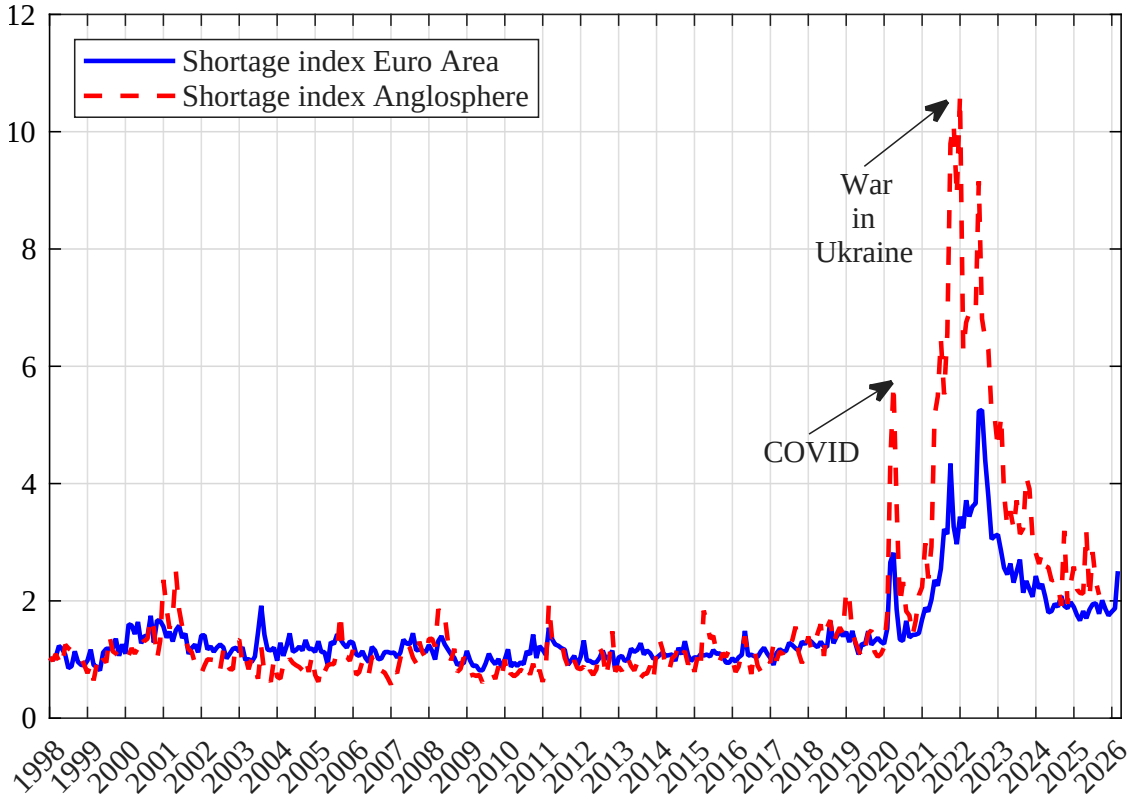

Figure 12: Euro Area Shortages Index and Anglosphere Shortages Index

Notes: Anglosphere Shortages Index based on the series provided by Caldara et al. (2025). Both series are standardized following the same methodology applied to our EA GPR index, and for comparability are rescaled to equal 1 in January 2010.

and in the euro area. Importantly, prices that have risen in response to shortages may not immediately return to their pre-shock levels, reflecting frictions in price setting, supply-chain changes, and production adjustments. These considerations motivate us to examine whether and to what extent shortages propagate and amplify the macroeconomic impact of geopolitical risk shocks.

A shortages indicator for the euro area. Following Caldara et al. (2025), we define a shortage as a situation in which supply fails to meet demand at prevailing prices. Caldara et al. (2025) construct a monthly shortages index (hereafter, Anglosphere shortages index) from major English-language newspapers. Adopting their methodology, we develop a shortages index for the euro area. Similar to the GPR and sanctions indices, our measure is based on news coverage from the same set of countries and local newspapers.[19] In our context, 'shortages' include broad categories, including industrial, labor, energy, and food shortages.

Figure 12 compares the Anglosphere shortages index with our aggregated euro area measure.[20] Both series show elevated shortages levels during the COVID-19 pandemic and the

[19] See Appendix J for more details on the search query underlying the EA shortages indicator.
[20] A plot of the shortages indices by euro area country is provided in Appendix K.

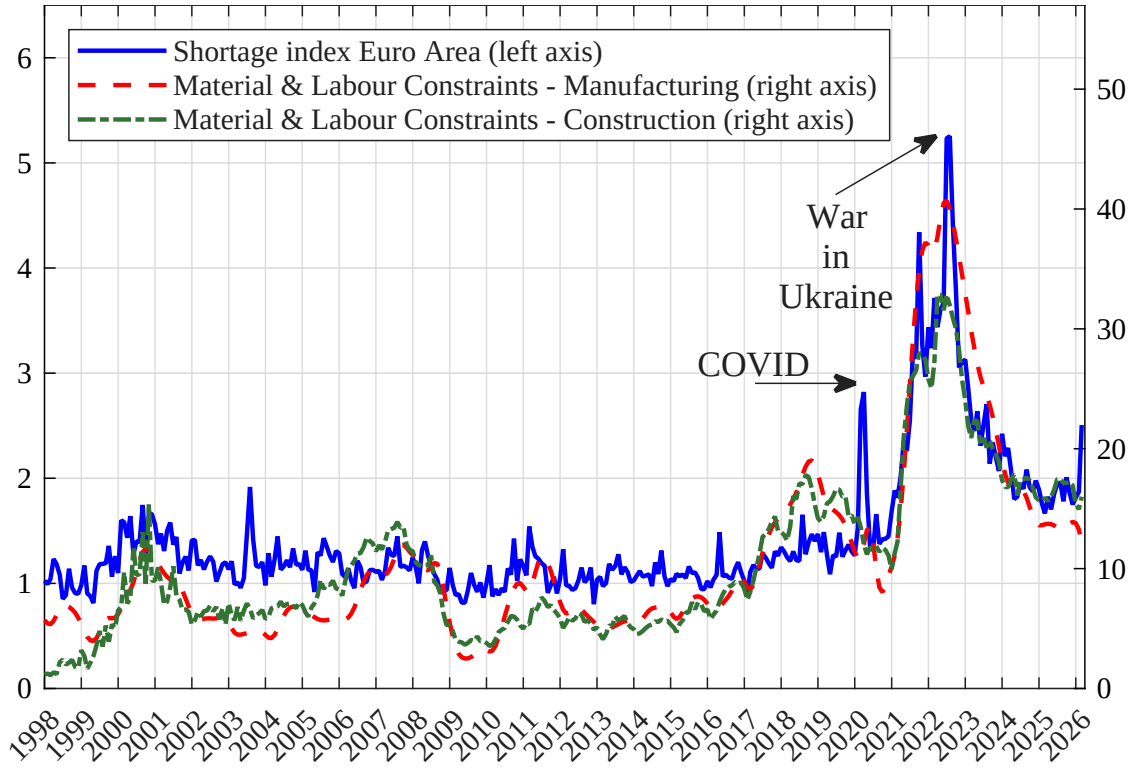

Figure 13: Euro Area Shortages Index and EU Supply Constraints Index

Notes: EU Supply Constraints Index is the average of two survey-based indicators from the European Commission: 'Labour constraints' and 'Material and/or equipment constraints'. Quarterly data are converted to a monthly frequency by applying cubic spline interpolation. Details on the data are in Appendix K.

war in Ukraine, reflecting increased concern over supply-chain vulnerabilities. Indeed, three major sources of supply disruptions are pandemics, geopolitical risk shocks and natural disasters; these events typically reduce trade and/or production efficiency. Over the recent five years when shortages became particularly salient, US media have devoted greater attention to supply disruption narratives than did euro area newspapers. Overall, the two indices are highly correlated, with a correlation coefficient of 0.9. This suggests that the shortages picked up by the two indices are equally important on both sides of the Atlantic.

To validate our measure, we draw on additional evidence on supply constraints in Europe. More specifically, we compute an aggregated measure of material and labor constraints, using quarterly data from the European Commission's Business and Consumer Surveys, which asks firms about the factors limiting their production. Figure 13 plots our EA Shortages index together with the EU supply constraints measures by industry for the manufacturing and construction sectors. Reassuringly, the correlations between the EA shortages index and the sector-specific constraints measure for the manufacturing and construction industries are high at 0.88 and 0.82, respectively.

The shortages channel of geopolitical risk. Figure 14 compares the baseline VAR specification that includes the shortages index with a counterfactual in which the shortages

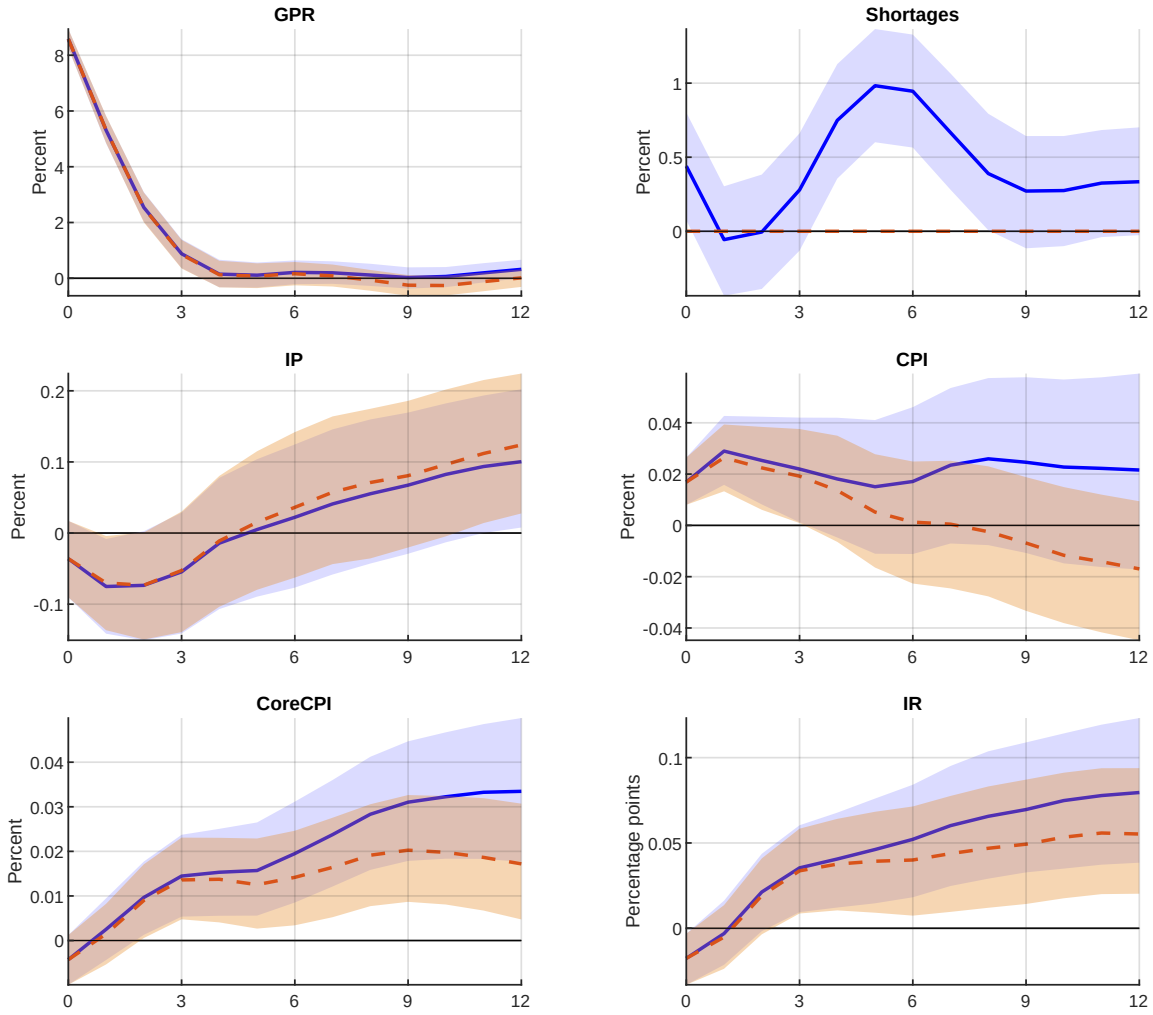

Figure 14: Impact of EA GPR shock with shortages channel: Active (blue solid line) and non-active (orange dashed line)

Notes: Impulse responses based on Bayesian vector autoregression (VAR) with Cholesky identification. The VAR uses the EA GPR index and the EA shortages index. Shaded areas denote 68% credible intervals.

channel is shut down.[21] For this counterfactual, we again modify the estimated VAR system ex post so as to remove any transmission from the geopolitical risk shock to the shortages index, following the same approach as for the sanctions channel.

The figure suggests that a GPR shock generates shortages, with the response peaking around the fifth month. The main differences across specifications also emerge around this horizon and arise primarily for prices rather than real activity: when shortages are allowed to respond endogenously, headline and core prices react somewhat more strongly and persistently. In particular, core inflation peaks after about nine months when the shortages channel is shut down, whereas it continues to rise beyond this horizon when shortages are allowed to respond endogenously. This suggests that shortages are a relevant propagation channel through which GPR shocks generate persistent inflationary pressures, consistent with the interpretation of the shortages measure as capturing supply-side pressures closely

[21] Appendix K contains the complete set of results for the shortages channel counterfactual exercise.

linked to inflation dynamics.

5 Conclusion

Geopolitical risk (GPR) is on the rise worldwide, with the euro area and Europe particularly exposed. To measure and assess the macroeconomic impact of GPR shocks in the euro area, it is essential to account explicitly for the region-specific perception of geopolitical risk. To this end, we develop a euro area geopolitical risk indicator available at daily and monthly frequency, using local newspapers from major euro area countries. We show that the historical co-movement between the EA GPR and Anglosphere GPR diverges with the major escalation of the Russia-Ukraine conflict in 2022. Since then, geopolitical risk in the euro area has remained persistently above the level implied by its historical relation with the Anglosphere index.

Armed with this new measure, we first show that geopolitical risk shocks have severe effects on euro area real activity. Second, we uncover significant inflationary effects of geopolitical risk in the euro area, which become visible only once GPR is measured through a European lens. In a 'No-War' counterfactual analysis, we quantify the substantial macroeconomic costs of the war in Ukraine for the euro area since 2022. We further show, using structural scenario analysis, that the euro area outlook is highly sensitive to alternative future paths of geopolitical risk amid the recent conflicts in the Middle East. Finally, we construct additional euro area specific indicators of sanctions intensity and shortages to assess potential transmission channels of geopolitical risk. Our findings suggest that shortages play an important role in transmitting GPR shocks to prices in the euro area, whereas sanctions do not materially alter the overall propagation of these shocks.

Our findings also have clear policy implications. First, they show that geopolitical risk has material macroeconomic consequences for the euro area, combining recessionary pressures with inflationary dynamics that need to be assessed through a regional lens. Second, while sanctions appear to play only a limited role at the aggregate level, shortages emerge as a relevant source of inflationary pressure. From a euro area perspective, this suggests that sanctions may impose only limited short-run aggregate macroeconomic costs on the sender economy. By contrast, the importance of shortages points to the value of policies that strengthen supply-chain resilience, diversify critical inputs, and expand buffering capacity in order to mitigate the inflationary effects of geopolitical shocks.

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A Search query for measuring geopolitical risk

We adjust the search query developed by Caldara and Iacoviello (2022) so that it complies with the technical limitations of the Factiva database following Bondarenko et al. (2024). A key constraint in Factiva is the maximum permitted query length of 2046 characters. Since the original query in Caldara and Iacoviello (2022) exceeds this limit, our primary objective is to condense it without substantially altering its informational content. To achieve this, we rely on the asterisk wildcard (*), which substitutes for any number of characters that follow it. All modifications involving the wildcard are documented in Table A1.

Table A1: Adaptation of search query to Factiva database

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

When adapting the query, we also had to consider Factiva's specific syntax rules. Boolean operators such as AND, OR, and NOT match Factiva's internal syntax and thus remain unchanged. However, the operator NEAR/2 must follow Factiva's convention and be written as NEAR2. Furthermore, Factiva does not require specifying document types within the query. Consequently, we remove the segment DTYPE(article OR commentary OR editorial OR feature OR front page article OR front page/cover story OR news OR report OR review), which also helps shorten the query.

In addition, we eliminated the term build-up* from the query because Factiva does not allow the wildcard to follow only two characters (e.g., up*). The database requires at least three characters before the asterisk. By contrast, the query used to count the total number of articles remains unchanged, as its structure is fully compatible with Factiva's search rules. The final adapted query is presented in Appendix A.

When translating the query into other languages, we account for cultural and linguistic nuances by selecting appropriate synonyms and evaluating the probability of their appearance within a geopolitical risk context. Specifically, we create translated search queries using a combination of professional translators and large language models, and verify them with native-language economists.

Finally, creating a query to capture the total number of articles cannot rely merely on translating the English version. Linguistic differences across languages make such a strategy impractical. Instead, we compile lists of the most frequent function words and retain only those that are likely to appear in nearly all texts.

When constructing the Geopolitical Risk Index for the Anglosphere, we follow the original approach of Caldara and Iacoviello (2022) by using the same set of news sources: The Guardian, The Daily Telegraph, The Financial Times, The Globe and Mail, Chicago Tribune, Los Angeles Times, The New York Times, USA Today, The Wall Street Journal, and The Washington Post. All of these newspapers are fully available in Factiva starting from 1 January 1985, which ensures consistency with the temporal coverage of the benchmark GPR index and guarantees comparability of results across studies.

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".

Germany

Search query 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 Befuerchtung* 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 ((Militaer* OR Truppen OR Rakete* OR Waffe* OR Bombe* OR Sprengk*) AND (Aufbau* OR Blockade* OR Sanktion* OR Embargo OR Quarantaene OR Ultimatum OR mobilis* OR Offensive)) OR ((Nuklear* OR "nuklearer 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 Befuerchtung* OR Spannung* OR Droh* OR unvermeid* OR erschreck*)) OR ((Terroris* OR Guerilla* OR Geisel*) near2 (Risiko* OR warn* OR Angst* OR Sorge* OR befuercht* OR Gefahr* OR gefaehrlich* OR bedroh* OR zweifel* OR Krise OR Unruh* OR Auseinandersetzung* OR Disput* OR Streit* OR Bedenken* OR Befuerchtung* OR Spannung* OR droh* OR unvermeidlich OR Schreck*)) OR ((Krieg OR Konflikt OR Kampfhandl* OR Revolution* OR Aufstand OR Revolte OR Staatsstreich OR geopolitisch*) near2 (beginn* OR begann OR begonn* OR Ausbruch OR "brach aus" OR start* OR anfang* OR erklaer* OR Verkuendung)) OR ((verbuendet* OR alliiert* OR feind* OR Gegner* OR Armee OR Streitkraefte OR Marine OR Luft* OR Truppen OR Rebellen OR Aufst*) near2 (bombard* OR vorrueck* OR Vormarsch OR Einmarsch OR zusammenst* OR angr* OR ueberf* OR Anschlag*)) OR ((Terroris* OR Guerilla* OR Geisel*) near2 (Akt OR Tat OR Angriff OR Bombe* OR toet* OR Anschlag* OR angr* OR entfuehr*)) 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 the counting 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).

France

Search query for geopolitical risk: ((guerre* OR conflit* OR hostilites OR revolut* OR insurrect* OR revolt* OR rebell* OR "coup d'Etat" OR geopolit*) near2 (risqu* OR avertisse* OR peur* OR danger* OR menace* OR doute* OR crise* OR agitat* OR desaccord* OR preoccup* OR tension* OR imminent* OR inevita* OR position OR bord OR crainte* OR peril*)) OR ((paix OR treve* OR armistice OR traite* OR pourparl*) near2 (menace* OR rejet* OR boycott* OR interrup* OR peril)) OR ((militaire* OR troupes OR missile* OR arme* OR bombe* OR ogive*) AND (renforcem* OR blocus OR sanction* OR embargo OR quarant* OR ultimat* OR mobilisat* OR offens*)) OR (("guerre nucléaire" OR "conflit nucleaire" OR "ogive nucleaire") OR ("guerre atomique" OR "conflit atomique" OR "ogive atomique") OR ("missile nucleaire" OR "bombe nucleaire" OR "bombe atomique" OR "bombe H" OR "bombe a hydrogene" OR "essai nucleaire") AND (risqu* OR avertisse* OR peur* OR danger* OR menace* OR doute* OR crise*

OR agitat* OR desaccord* OR preoccup* OR tension* OR imminent* OR inevita* OR position OR bord OR crainte* OR peril*)) OR ((terroris* OR guerilla* OR otage*) near2 (risqu* OR avertiss* OR peur* OR danger* OR menace* OR doute* OR crise* OR agitat* OR desaccord* OR preoccup* OR tension* OR imminent* OR inevitable* OR position OR bord OR crainte* OR peril)) OR ((guerre* OR conflit* OR hostili* OR revolut* OR insurrect* OR revolte* OR rebell OR "coup d'Etat" OR geopolit*) near2 (debut* OR commen* OR eclatem* OR eclate OR declarat* OR proclama* OR lancement* OR engager*)) OR ((allie* OR ennemi* OR adversa* OR armee* OR marine OR aerien* OR troupes OR rebelles OR insurge*) near2 (avancer* OR bombard* OR progress* OR invasion* OR envahir OR affrontem* OR attaque* OR raid OR lancem* OR frappe*)) OR ((terroris* OR guerilla* OR otage*) near2 (acte* OR attaque* OR bombe* OR tuer OR frappe* OR enlever)) NOT (film* OR cinema OR musee* OR annivers* OR necrol* OR memorial* OR art* OR livre* OR memoire* OR "guerre des prix" OR jeu* OR histoire* OR veteran* OR hommage OR sport OR musique OR course OR cancer).

Search query for the counting total number of articles: le AND est AND à AND de AND et AND en AND dans.

Italy

Search query for geopolitical risk: ((guerra* OR conflitt* OR ostilita OR rivoluzion* OR insurrezion* OR rivolt* OR ribellion* OR "colpo di stato" OR geopolitic*) near2 (risch* OR avvert* OR paur* OR pericol* OR minacc* OR dubb* OR crisi* OR disordin* OR disput* OR preoccup* OR tension* OR imminen* OR inevitab* OR destabilizz* OR panico OR sogli* OR allarm*)) OR ((pac* OR tregua* OR armistizio OR trattat* OR trattativ*) near2 (minacc* OR rifiut* OR boicott* OR interruz* OR pericol*)) OR ((militar* OR truppe OR missil* OR arm* OR bomb* OR testat*) AND (aument* OR blocco* OR sanzion* OR embar* OR quarant* OR ultimat* OR mobilitaz* OR offensiv*)) OR (("guerra nucleare" OR "conflitto nucleare" OR "testata nucleare") OR ("guerra atomica" OR "conflitto atomico" OR "testata atomica") OR ("missile nucleare" OR "bomba nucleare" OR "bomba atomica" OR "bomba H" OR "bomba all'idrogeno" OR "test nucleare") AND (risch* OR avvert* OR paur* OR pericol* OR minacc* OR dubb* OR crisi* OR disordin* OR disput* OR preoccup* OR tension* OR imminen* OR inevitab* OR destabilizz* OR panico OR sogli* OR allarm*)) OR ((terrori* OR guerrigl* OR ostagg*) near2 (risch* OR avvert* OR paur* OR pericol* OR minacc* OR dubb* OR crisi* OR disordin* OR disput* OR preoccup* OR tension* OR imminen* OR inevitab* OR destabilizz* OR panico OR sogli* OR allarm*)) OR ((guerra* OR conflitt* OR ostilita OR rivoluzion* OR insurrezion* OR rivolt* OR ribellion* OR "colpo di stato" OR geopolitic*) near2 (iniz* OR cominc* OR scopp* OR avven* OR dichiar* OR proclamaz* OR lanc* OR intraprend*)) OR ((alleat* OR nemic* OR avversar* OR esercit* OR marina OR aereo* OR truppe OR ribell* OR insorg*) near2 (avanz* OR bombar* OR invasi* OR scontr* OR attacc* OR raid OR lanci* OR colp*)) OR ((terrori* OR guerrigl* OR ostagg*) near2 (atto* OR attacc* OR bomb* OR uccid* OR colpir* OR dirott*)) NOT (film* OR cinema OR muse* OR anniversa* OR necrolog* OR memorial* OR art* OR libr* OR memor* OR "guerra dei prezzi" OR gioco* OR raccont* OR storia OR veteran* OR tribut* OR sport OR musica OR competizion* OR cancro).

Search query for the counting total number of articles: il AND di AND e AND su AND in.

Spain

Search query for geopolitical risk: ((guerra* OR conflic* OR hostilid* OR revoluc* OR insurrecc* OR levantam* OR revuelt* OR "golpe de Estado" OR geopolitic*) near2 (riesg* OR advert* OR tem* OR miedo* OR peligr* OR amena* OR dud* OR crisis* OR disturb* OR disput* OR preocup* OR tensi* OR inminent* OR inevitab* OR desestabiliz* OR borde* OR espant* OR sust*)) OR ((paz OR tregua* OR armist* OR tratad* OR negociac*) near2 (amena* OR recha* OR boicot* OR interru* OR peligr*)) OR ((militar* OR tropas OR misil* OR arma* OR bomba* OR ojiva*) AND (acumulac* OR bloqu* OR sanci* OR embargo OR cuarenten* OR ultimatum OR movili* OR ofensiv*)) OR (("guerra nuclear" OR "conflicto nuclear" OR "ojiva nuclear") OR ("guerra atomica" OR "conflicto atomico" OR "ojiva atomica") OR ("misil nuclear" OR "bomba nuclear" OR "bomba atomica" OR "bomba H" OR "bomba de hidrogeno" OR "ensayo nuclear") AND (riesg* OR advert* OR tem* OR miedo* OR peligr* OR amena* OR dud* OR crisis* OR disturb* OR disput* OR preocup* OR tensi* OR inminent* OR inevitab* OR desestabiliz* OR borde* OR espant* OR sust*)) OR ((terrori* OR guerrill* OR reh*) near2 (riesg* OR advert* OR tem* OR miedo* OR peligr* OR amena* OR dud* OR crisis* OR disturb* OR disput* OR preocup* OR tensi* OR inminent* OR inevitab* OR desestabiliz* OR borde* OR espant* OR sust*)) OR ((guerra* OR conflic* OR hostilid* OR revoluc* OR insurrecc* OR levantam* OR revuelt* OR "golpe de Estado" OR geopolitic*) near2 (comienz* OR comenz* OR inici* OR estall* OR brot* OR declar* OR proclamac* OR lanz* OR emprend*)) OR ((aliad* OR enemig* OR adversar* OR ejercit* OR marina* OR aere* OR tropas OR rebeld* OR insurg*) near2 (avan* OR bombarde* OR invasi* OR enfrent* OR ataqu* OR incurs* OR lanzam* OR golp*)) OR ((terrori* OR guerrill* OR reh*) near2 (acto* OR ataqu* OR bomb* OR mat* OR asesin* OR golp* OR secuestr*)) NOT (pelicul* OR cine OR muse* OR aniversar* OR obituar* OR memorial* OR art* OR libr* OR memor* OR "guerra de precios" OR jueg* OR cuent* OR histori* OR veteran* OR homenaj* OR deport* OR music* OR carrer* OR cancer).

Search query for the counting total number of articles: el AND es AND a AND de AND y AND en.

The Netherlands

Search query for geopolitical risk: ((oorlog* OR conflict* OR vijandig* OR revolut* OR opstand* OR muiter* OR "staatsgreep" OR geopolitiek*) near2 (risic* OR waarschuwing* OR angst* OR gevaar* OR bedreig* OR twijf* OR crisis* OR onrust* OR geschil* OR bezorgd* OR spann* OR dreig* OR onvermijd* OR destabilisat* OR paniek* OR drempel* OR alarm*)) OR ((vrede* OR wapenstil* OR verdrag* OR onderhandel*) near2 (bedreig* OR weiger* OR boycot* OR onderbrek* OR gevaar*)) OR ((militair* OR troep* OR raket* OR wapen* OR bom* OR kernkop*) AND (opbouw* OR blokkad* OR sanct* OR embargo OR quarantaine OR ultimatum OR mobilisat* OR offensief*)) OR (("nucleaire oorlog"

OR ”nucleair conflict” OR ”nucleaire kernkop”) OR (”atoomoorlog” OR ”atoomconflict” OR ”atoomkernkop”) OR (”nucleaire raket” OR ”nucleaire bom” OR ”atoombom” OR ”bom H” OR ”bom waterstof” OR ”kernproef”) AND (risic* OR waarschuwing* OR angst* OR gevaar* OR bedreig* OR twijf* OR crisis* OR onrust* OR geschil* OR bezorgd* OR spann* OR dreig* OR onvermijd* OR destabilisat* OR paniek* OR drempel* OR alarm*)) OR ((terroris* OR guerrill* OR gijzel*) near2 (risic* OR waarschuwing* OR angst* OR gevaar* OR bedreig* OR twijf* OR crisis* OR onrust* OR geschil* OR bezorgd* OR spann* OR dreig* OR onvermijd* OR destabilisat* OR paniek* OR drempel* OR alarm*)) OR ((oorlog* OR conflict* OR vijandig* OR revolut* OR opstand* OR muiter* OR ”staatsgreep” OR geopolitiek*) near2 (begin* OR start* OR uitbraak* OR verklaring* OR proclamatie* OR lancering* OR onderneem*)) OR ((bondgen* OR vijand* OR tegenst* OR leger* OR marine* OR luchtmacht* OR troep* OR rebel* OR opstandel*) near2 (vooruitg* OR bombard* OR invasie* OR confront* OR aanval* OR inval* OR lancering* OR slag*)) OR ((terroris* OR guerrill* OR gijzel*) near2 (daad* OR aanval* OR bom* OR dood* OR moord* OR slag* OR kaping*)) NOT (film* OR bioscoop* OR museum* OR jubileum* OR necrolog* OR herdenk* OR kunst* OR boek* OR memori* OR ”prijsoorlog” OR spel* OR verhaal* OR geschied* OR veteraan* OR eerbetoon* OR sport* OR muziek* OR wedstrijd* OR kanker).

Search query for the counting total number of articles: de AND het AND en AND van AND in AND te AND dat AND met AND is.

B Circulation, release frequency and first edition of media sources

Table B1: Media sources

Name of newspaper/magazine	Circulation	Release frequency	First edition
Germany			
Frankfurter Allgemeine Zeitung	144744	Daily	1949
Süddeutsche Zeitung	206643	Daily	1945
Handelsblatt	70575	Daily	1946
Die Welt	45454	Daily	1946
taz - die tageszeitung	35943	Daily	1978
France			
Le Monde	530000	Daily	1944
Le Figaro	354853	Daily	1826
Les Echos	139877	Daily	1908
La Tribune	531000	Weekly	1985
Italy			
Il Sole 24 Ore	119306	Daily	1965
Corriere della Sera	208000	Daily	1876
La Repubblica	137000	Daily	1976
La Stampa	110000	Daily	1867
Italia Oggi	n/a	Daily	1991
Milano Finanza	n/a	Daily	1989
Spain			
El País	52024	Daily	1976
El Mundo	68000	Daily	1989
ABC	85000	Daily	1903
La Vanguardia	84000	Daily	1881
Expansión	55971	Daily	1986
Cinco Días	25000	Daily	1978
Netherlands			
ANP Binnenland	n/a	Daily	1934
Reformatorisch Dagblad	42000	Daily	1971
Dutch Government News	n/a	Daily	2016
ANP Economie	n/a	Daily	1934
De Groene Amsterdammer	40000	Weekly	1877

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

C Alternative measurement: Universe of newspapers

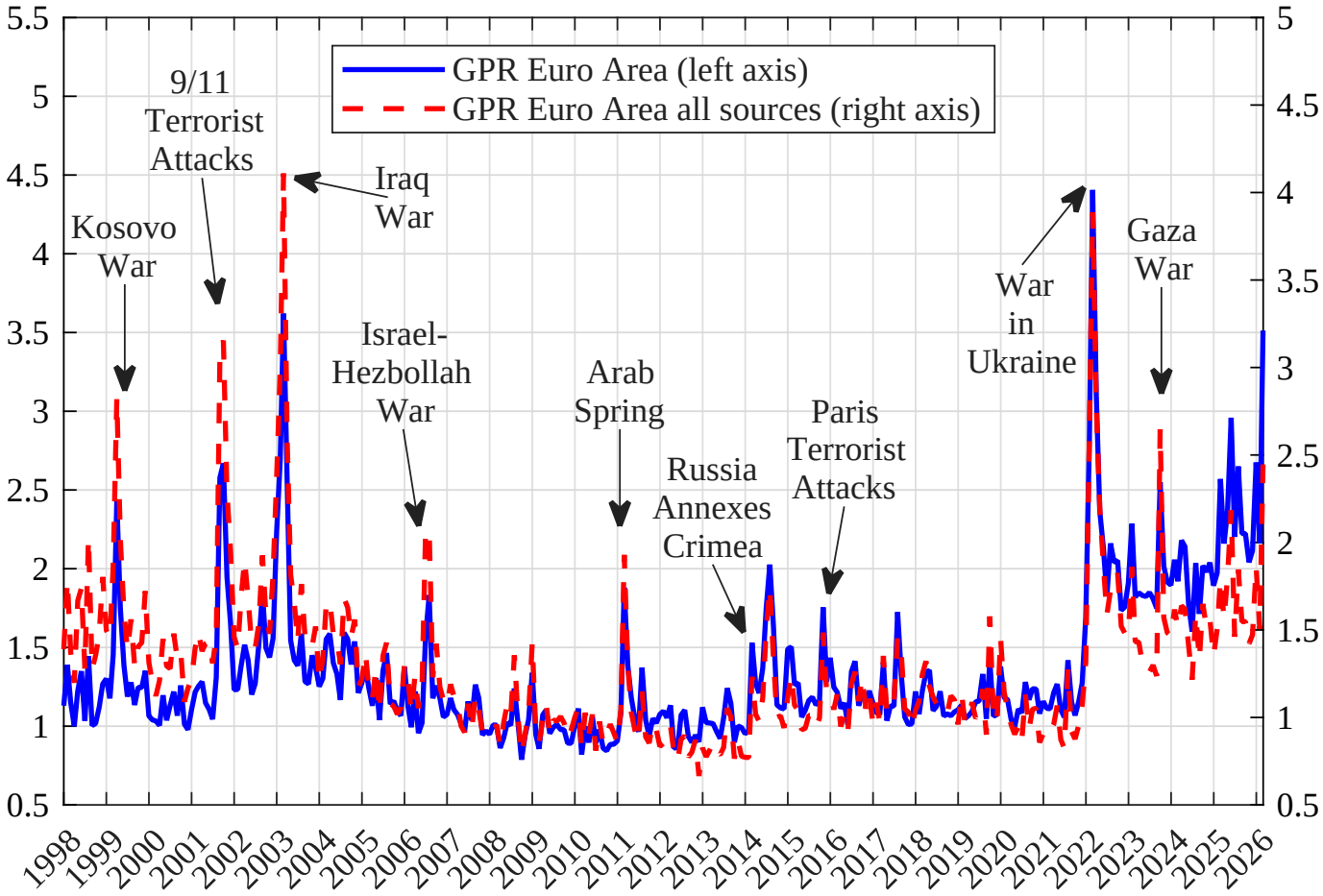

Figure C.1: Euro area geopolitical risk index: Baseline vs. all Factiva Sources

D Daily EA GPR index construction

Conceptual framework

The construction of the daily EA GPR index follows the methodology of Caldara and Iacoviello (2022), who propose a news-based measure of geopolitical risk at the daily frequency. We adopt their conceptual approach and adapt it to a multilingual European setting.

Daily news data are obtained from Factiva Analytics. For each country, we rely exclusively on major national newspapers with broad circulation and long time coverage. The sources used in the construction of the country-level daily indices are:

- **Germany:** Süddeutsche Zeitung; Handelsblatt; Die Welt; taz – die tageszeitung.
- **France:** Le Monde; Le Figaro; Les Echos; La Tribune.
- **Italy:** Il Sole 24 Ore; Corriere della Sera; La Stampa; La Repubblica; Italia Oggi; Milano Finanza.
- **Spain:** El País; El Mundo; ABC; La Vanguardia; Expansión; Cinco Días.

We initially extracted daily data for the five countries that we use to construct our monthly EA GPR measure: Germany, France, Italy, Spain, and the Netherlands. However, we encountered limited source coverage and systematic gaps in the Dutch series in Factiva Analytics. Given that the Netherlands accounts for less than 10 percent of the combined GDP of the five countries under consideration, we decided to exclude this country from the construction of the daily EA GPR index. This small effective weight means the exclusion has a rather negligible effect on the aggregate index.

Construction of daily country-level indices

For each country, we extract the daily number of articles containing terms related to geopolitical risk using the translated search queries. Following Caldara and Iacoviello (2022), we compute a daily country-level GPR index as the ratio of geopolitical-risk-related articles to the total number of articles published on that day.

To validate the construction, we aggregate the daily indices to the monthly frequency and compare them to the monthly GPR series directly provided by Factiva. Prior to computing correlations, both series are standardized around January 2010 using an identical normalization procedure, i.e., divided by their respective (average) values in January 2010. The resulting within-country correlations are high (Germany: 0.966; France: 0.817; Italy: 0.890; Spain: 0.747), indicating close agreement between the two measures.

The daily EA GPR index is then constructed as a GDP-weighted average of the four daily country-level indices (Germany, France, Italy, and Spain). The weights are based on

each country's share in aggregate euro area GDP in 2024 and are kept fixed over the sample period.

Formally, the daily EA GPR index is given by:

$$\mathrm{GPR}_t^{EA} = \sum_{i \in \{\mathrm{DE},\ \mathrm{FR},\ \mathrm{IT},\ \mathrm{ES}\}} w_i \, \mathrm{GPR}_{i,t}, \tag{2}$$

where $\mathrm{GPR}_{i,t}$ denotes the country-level daily GPR index and w_i are the fixed GDP weights.

Treatment of missing observations and calendar completion

A full daily calendar (including weekends) is constructed in order to match the format of the daily index provided by Caldara and Iacoviello (2022). Missing observations arise primarily because of low or zero publication activity, especially on Sundays in Germany and France, and occasionally on public holidays.

Missing periods are short: the maximum number of consecutive missing days is four for Germany and Italy, five for France, and four for Spain. To complete the daily calendar, we apply a forward-fill rule for up to five consecutive missing days. This procedure directly addresses the systematic 'Sunday effect' and short publication gaps around holidays.

As robustness checks, we also consider alternative treatments of missing days, including linear interpolation and averaging adjacent days (Saturday–Monday). The resulting series are highly correlated (correlation coefficients around 0.99), and differences in volatility and peak timing are quantitatively negligible.

Smoothing

In addition to the raw daily EA GPR series, we construct smoothed variants using 7-day and 30-day trailing moving averages. These moving averages are backward-looking and computed as simple averages over the current day and the previous $k-1$ days:

$$GPR_t^{EA,MA(k)} = \frac{1}{k} \sum_{j=0}^{k-1} GPR_{t-j}^{EA}, \quad k \in \{7, 30\}. \tag{3}$$

This procedure is consistent with the approach of Caldara and Iacoviello (2022).

GPR indices for five euro area countries

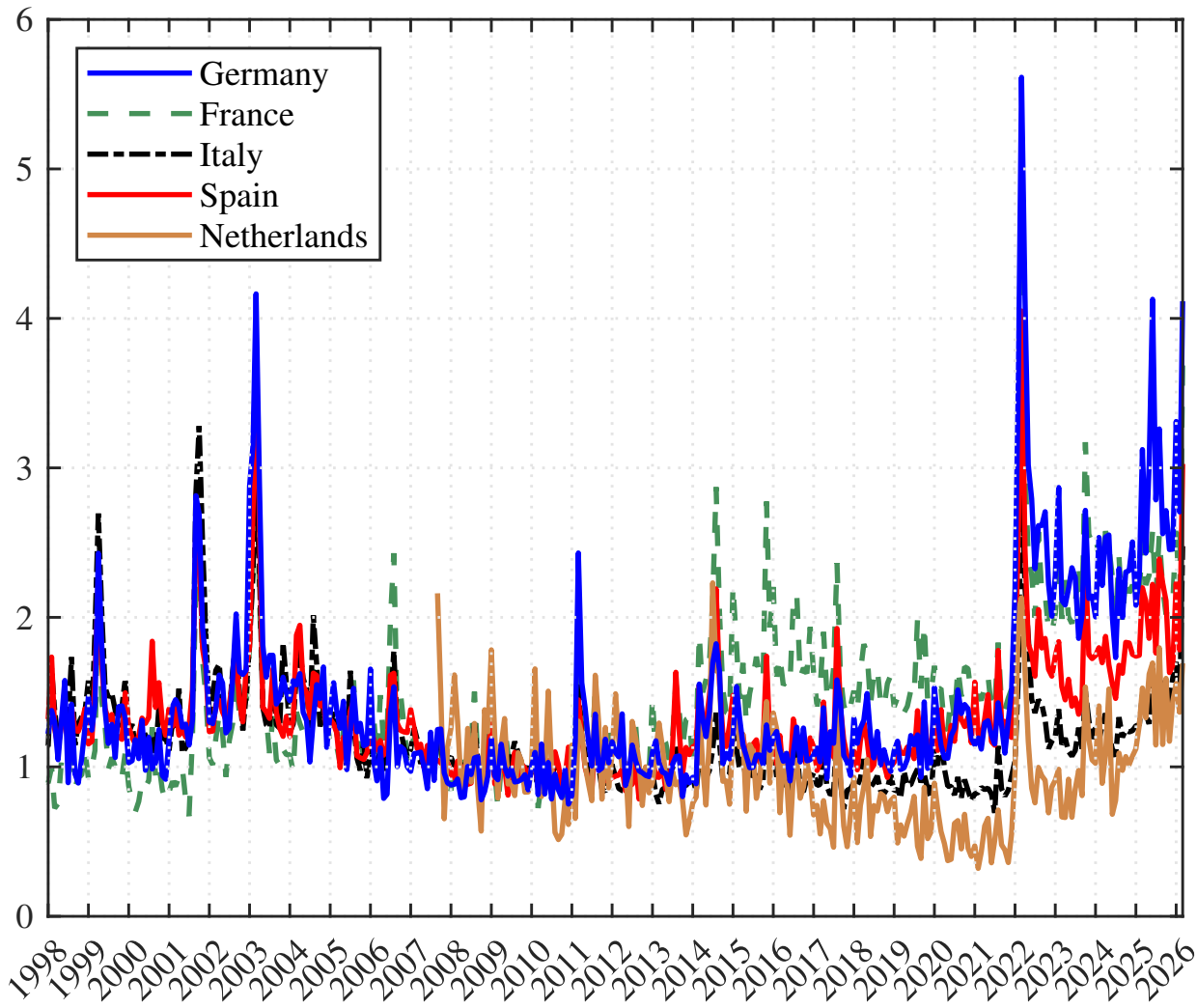

Figure D.1: GPR indices for five euro area countries

Notes: All series are standardized following the same methodology applied to our EA GPR index, and for comparability are rescaled to equal 1 in January 2010.

E European Union GPR

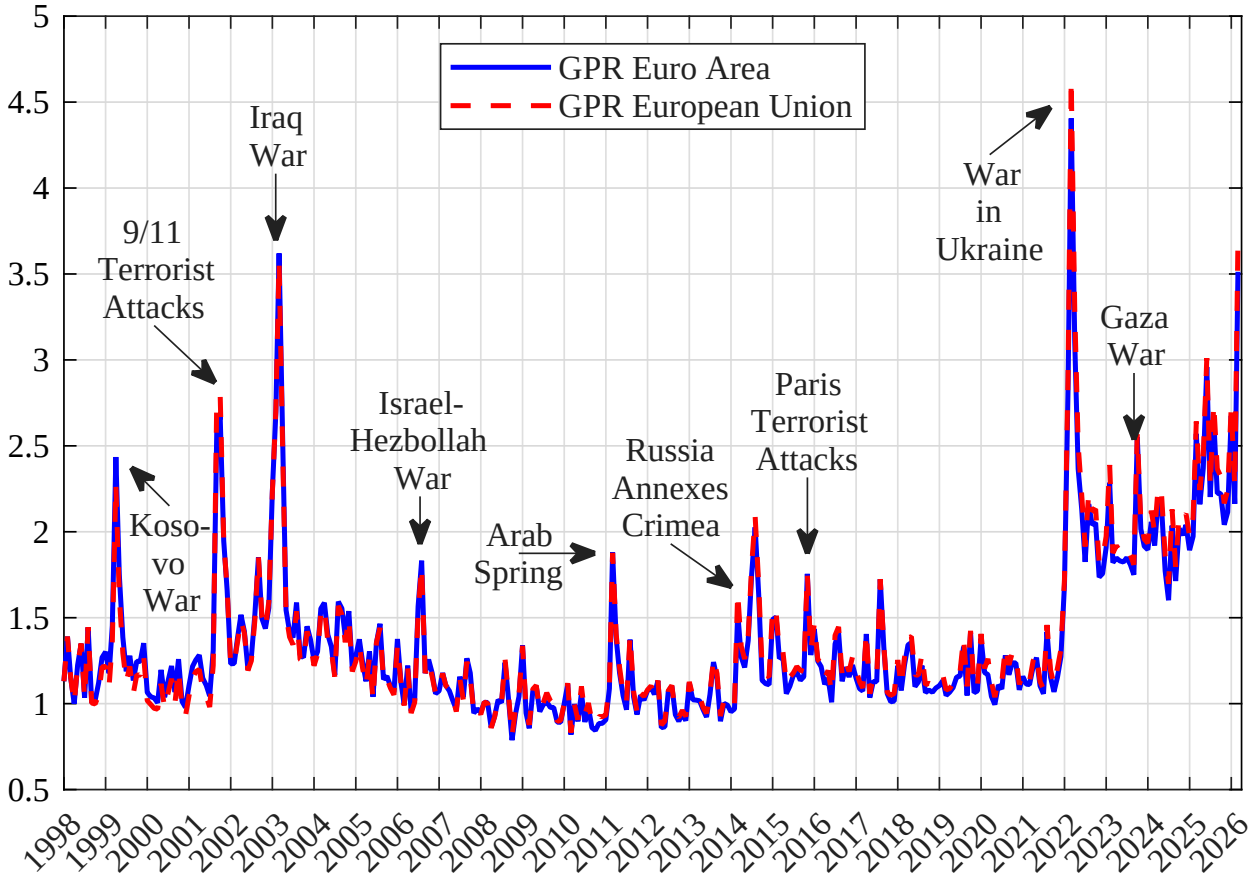

Figure E.1: Geopolitical risk index at monthly frequency: Euro area and European Union

Notes: The EA GPR index aggregates five country-level indices, while the EU GPR index aggregates six, all constructed from local-language newspapers. Both indices are normalized to equal 1 in January 2010 for comparability.

Search query for Poland

Search query for geopolitical risk: ((wojn* OR wojen* OR konflik* OR dzialan* wojenn* OR rewoluc* OR powstan* OR bunt* OR przewr* OR "zamach* stanu" OR geopolit*) near2 (ryzyk* OR ostrz* OR obaw* OR zagroz* OR niebezp* OR watpliwosc* OR kryzys* OR problem* OR spor* OR niepokoj* OR napiec* OR napiet* OR nieuchr* OR nieunik* OR grozb* OR krawed* OR strach*)) OR ((pokoj* OR rozejm* OR "zawies* broni" OR traktat* OR nego*) near2 (grozb* OR odrzuc* OR bojkot* OR zakloc* OR zagroz* OR niebezp*)) OR ((wojsk* OR oddzial* OR rakiet* OR bron* OR uzbroj* OR bomb* OR glowic*) AND (rozbudow* OR blokad* OR sankcj* OR embarg* OR kwarantann* OR ultimat* OR mobili* OR ofens*)) OR ((("wojn* nuklearn*" OR "wojn* jadr*" OR "glowic* nuklearn*" OR "wojn* atomow*" OR "glowic* atomow*" OR "bomb* atomow*" OR "bomb* wodor*" OR "test nuklearn*" OR "prob* nuklearn*")) AND (ryzyk* OR ostrz* OR obaw* OR zagroz* OR niebezp* OR watpliwosc* OR kryzys* OR problem* OR spor* OR niepokoj* OR napiec* OR napiet* OR nieuchr* OR nieunik* OR grozb* OR krawed* OR strach*)) OR ((terror* OR partyzan* OR zakladnik*) near2 (ryzyk* OR ostrz* OR obaw*

OR zagroz* OR niebezp* OR watpliwosc* OR kryzys* OR problem* OR spor* OR niepokoj* OR napiec* OR napiet* OR nieuchr* OR nieunik* OR grozb* OR krawed* OR strach*)) OR ((wojn* OR wojen* OR konflikt* OR dzialan* wojenn* OR rewolucj* OR powstan* OR bunt* OR przewr* OR "zamach* stanu" OR geopolit*) near2 (rozpocz* OR wybuch* OR start* OR oglos* OR dekl* OR proklam* OR uruchom* OR prowadz*)) OR ((sojuszni* OR przeciwnik* OR armi* OR marynar* OR lotnicz* OR powstanc*) near2 (natarc* OR ostrza* OR postep* OR inwaz* OR wkroczy* OR starc* OR atak* OR nalot* OR uderzen*)) OR ((terror* OR partyzan* OR zakladnik*) near2 (akt* OR atak* OR bomb* OR zaboj* OR uderz* OR porwan*)) NOT (film* OR kin* OR muze* OR rocznic* OR nekrolog* OR pamiec* OR sztuk* OR ksiazk* OR wspomnieni* OR "wojn* cenow*" OR gra* OR histori* OR weteran* OR hold* OR sport* OR muzyk* OR wyscig* OR rak).

Search query for the counting total number of articles: i AND w AND na AND z AND do AND ze AND sie.

Table B1: Media sources for Poland

Name of newspaper/magazine	Circulation	Release frequency	First edition
Gazeta Wyborcza	95,000	Daily	1989
Rzeczpospolita	54,000	Daily	1920
Parkiet	10,000	Daily	1994

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

F Data

This section describes the identifiers of the data we obtain from Haver. The identifiers are reported in brackets. 'sa' means that we use the seasonal adjustment procedure implemented in Haver.

- Industrial production excluding construction (C023IZ@OECDMEI)
- Euro Area Harmonized Consumer Price Index (sa(N023PHPC@OECDMEI))
- Euro Area Core Harmonized Consumer Price Index, all items excluding food, energy, tobacco and alcohol (sa(N023PHXF@OECDMEI))
- ECB main refinancing operations rate, effective date (I023MRE@EUDATA)
  - For 1998: Bundesbank repo allotment rate (DENRR@GERMANY)
  - For the period covered by Wu and Xia (2017):
    Euro area shadow rate (I023SHDW@EUDATA), used instead of the MRO rate
- Euro Stoxx 600 equity price index (S023TBU@EUDATA)
- Euro Area residential property prices (sa(Q997ZTTW@BIS))

G Additional results: EA GPR indicator

Euro Area and Anglosphere GPR shock comparison

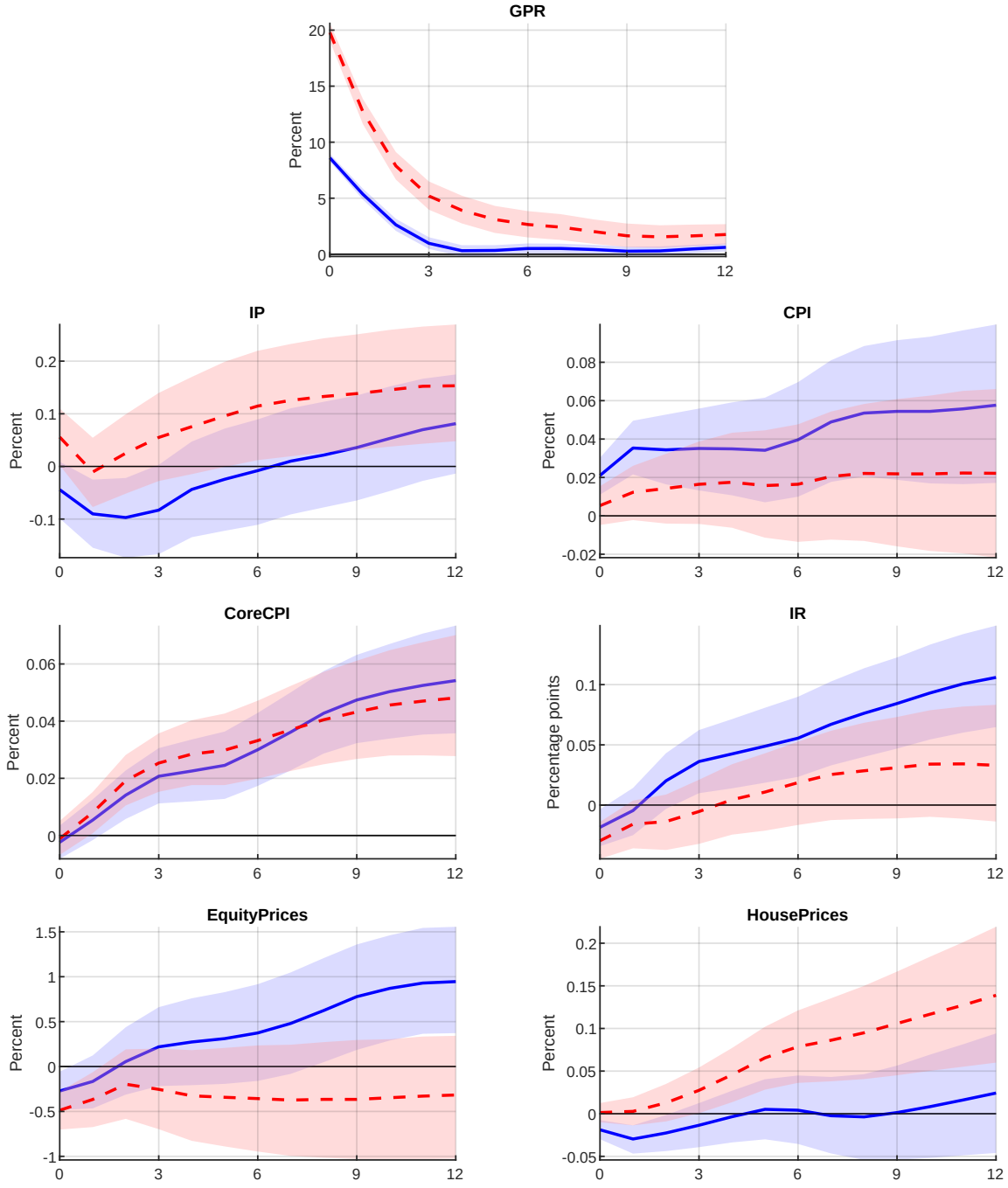

Figure G.1: Impact of euro area (solid line) and Anglosphere (dashed line) geopolitical risk shocks on euro area economy

Notes: Impulse responses based on two Bayesian vector autoregressions (VAR) with Cholesky identification. The first VAR uses the EA GPR index and the second VAR the Anglosphere GPR index as provided by Caldara and Iacoviello (2022), which both are ordered first in their respective VAR models. Solid and dashed lines denote median and shaded areas the corresponding 68% credible intervals.

Comparison to Anglosphere GPR index constructed from Factiva

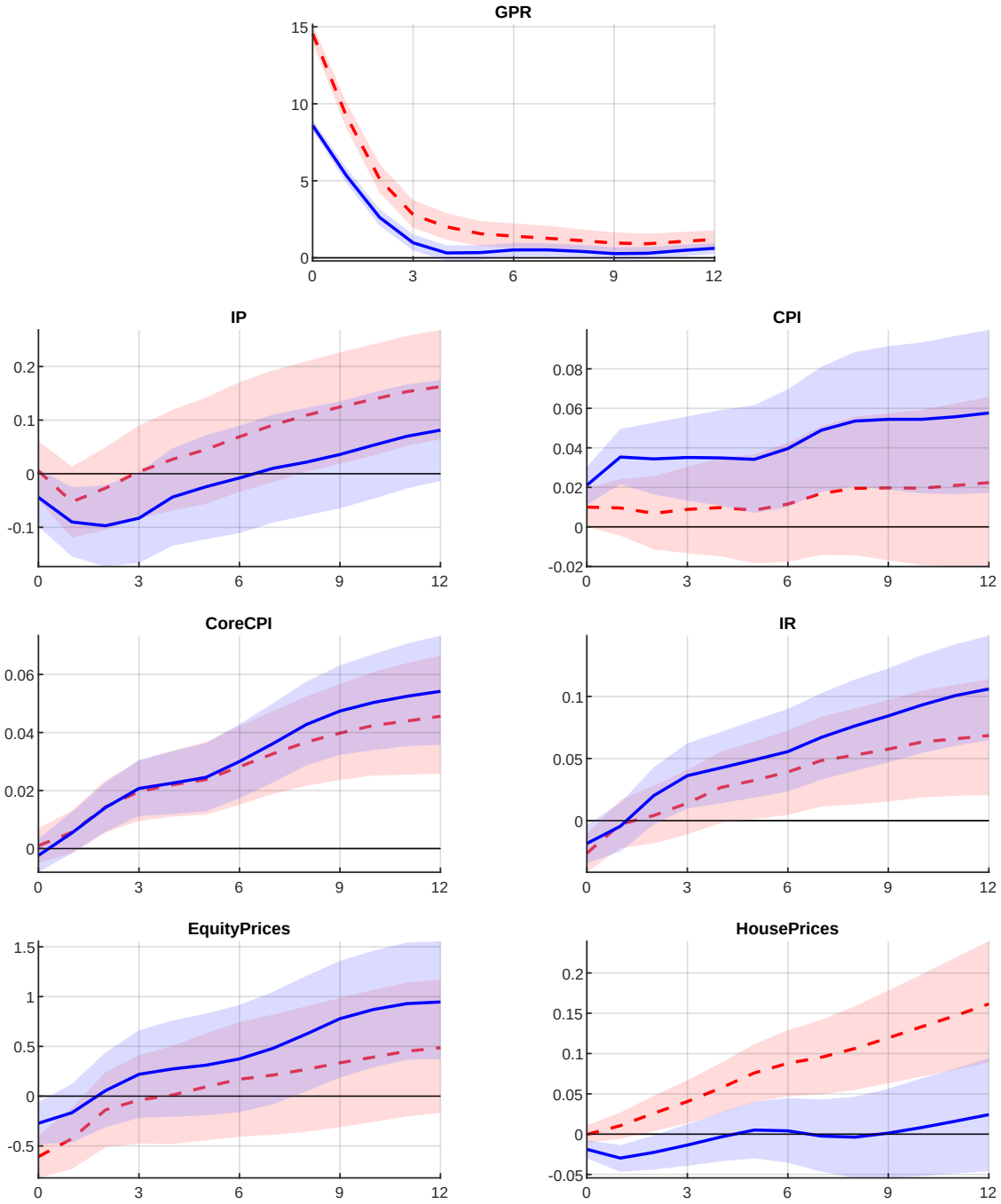

Figure G.2: Impact of euro area (solid line) and Anglosphere (dashed line, from Factiva) geopolitical risk shocks on euro area economy

Notes: Impulse responses based on two Bayesian vector autoregressions (VAR) with Cholesky identification. The first VAR uses the EA GPR index and the second VAR the Anglosphere GPR index constructed from Factiva, which both are ordered first in their respective VAR models. Shaded areas denote 68% credible intervals.

Comparison to EA GPR indicator using all sources

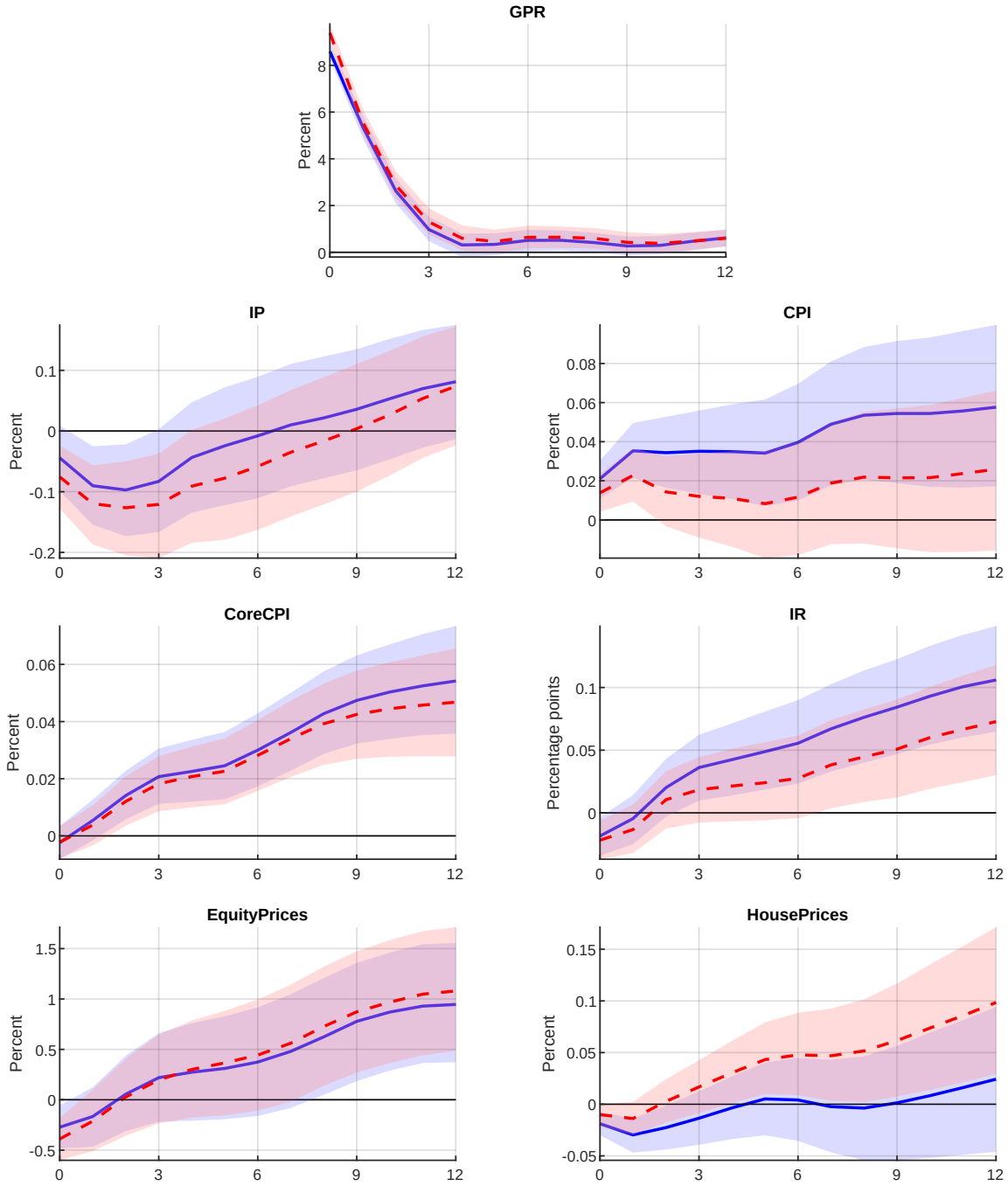

Figure G.3: Impact of euro area (solid line, limited sources) and euro area (dashed line, all sources) geopolitical risk shocks on euro area economy

Notes: Impulse responses based on two Bayesian vector autoregressions (VAR) with Cholesky identification. The first VAR uses the EA GPR index build from the mentioned set of media sources and the second VAR the EA GPR index constructed from all sources available in Factiva for a specific country. Both indices are ordered first in their respective VAR models. Shaded areas denote 68% credible intervals.

'No-War' counterfactual

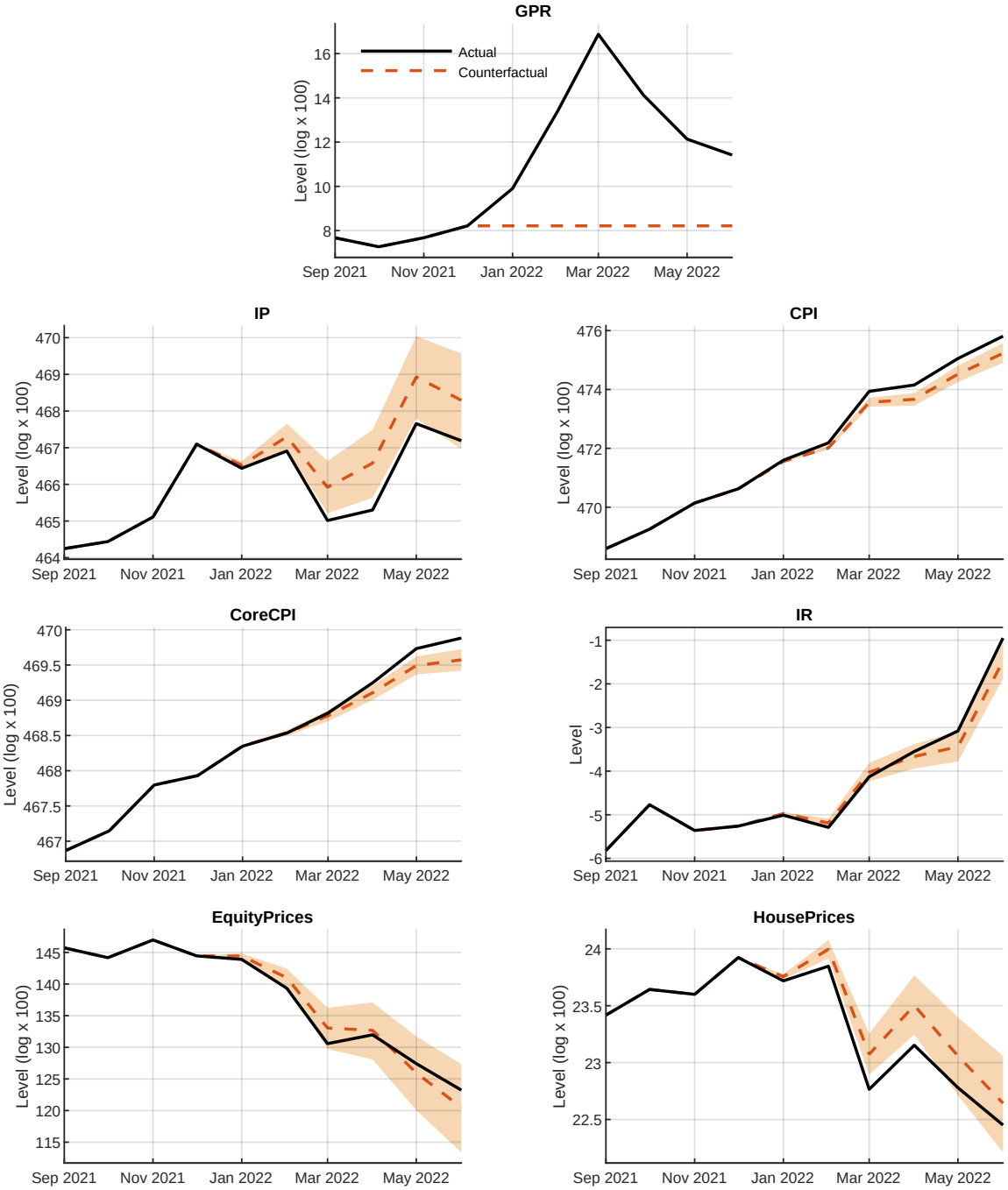

Figure G.4: 'No-War' counterfactual path of GPR: original data (solid line) and counterfactual data (dashed line)

Notes: Counterfactual path of GPR index, assuming constant levels as of December 2021, achieved by adjusting the GPR shock. The VAR uses the EA GPR index, which is ordered first. The corresponding GPR shock is identified via a Cholesky decomposition.

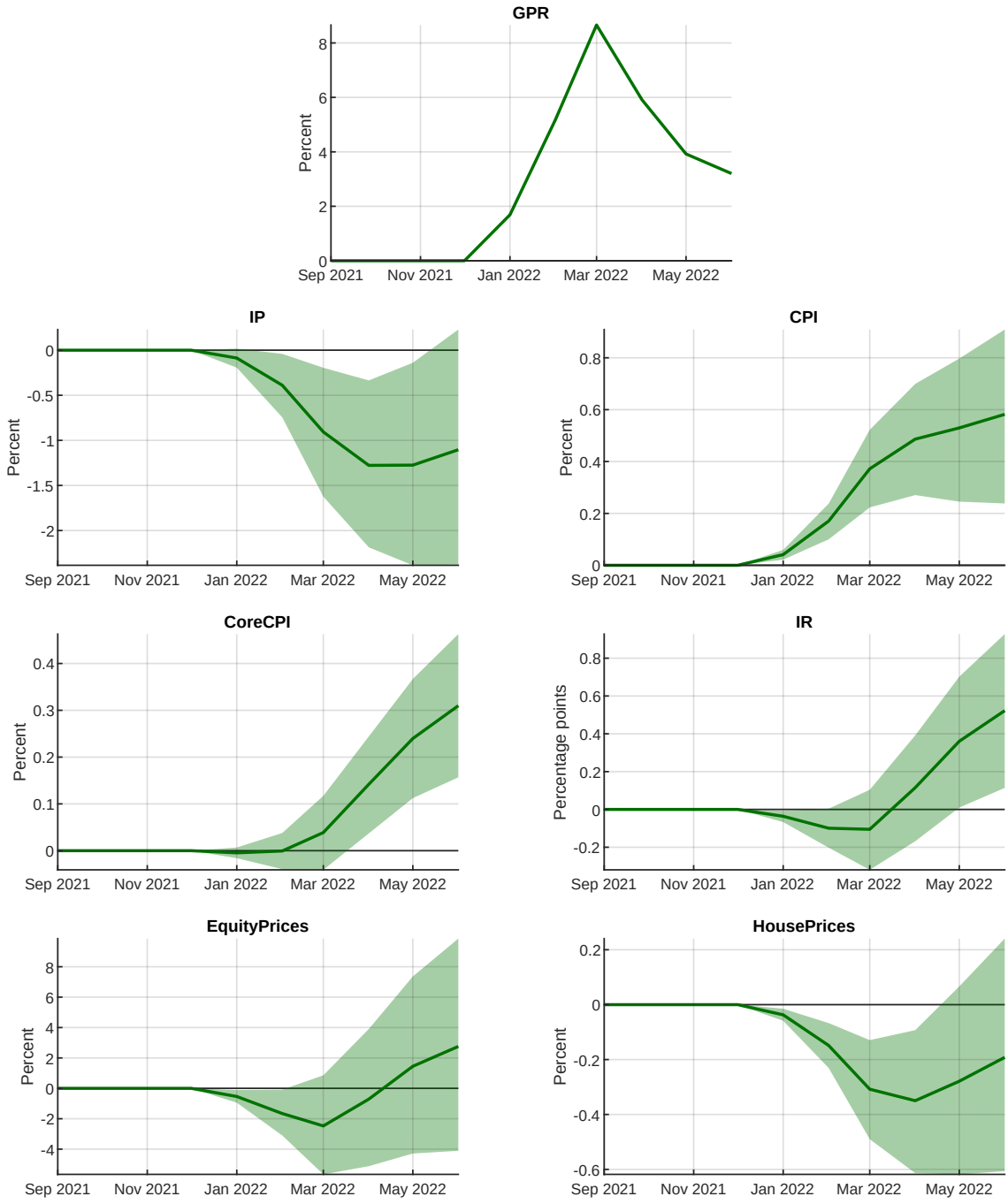

Figure G.5: War vs. 'No-War' path difference

Notes: Figure shows the deviation of the actual data minus the counterfactual data, that assumes a constant level of the GPR index, starting from December 2021; see Figure G.4. The constant level assumes that the structural GPR shocks adjust such that the GPR index remains constant. The counterfactual data are based on a Bayesian vector autoregression (VAR) with Cholesky identification, ordering the EA GPR index first. Shaded areas denote the 68% credible intervals.

H The Middle East conflict and euro area prospects

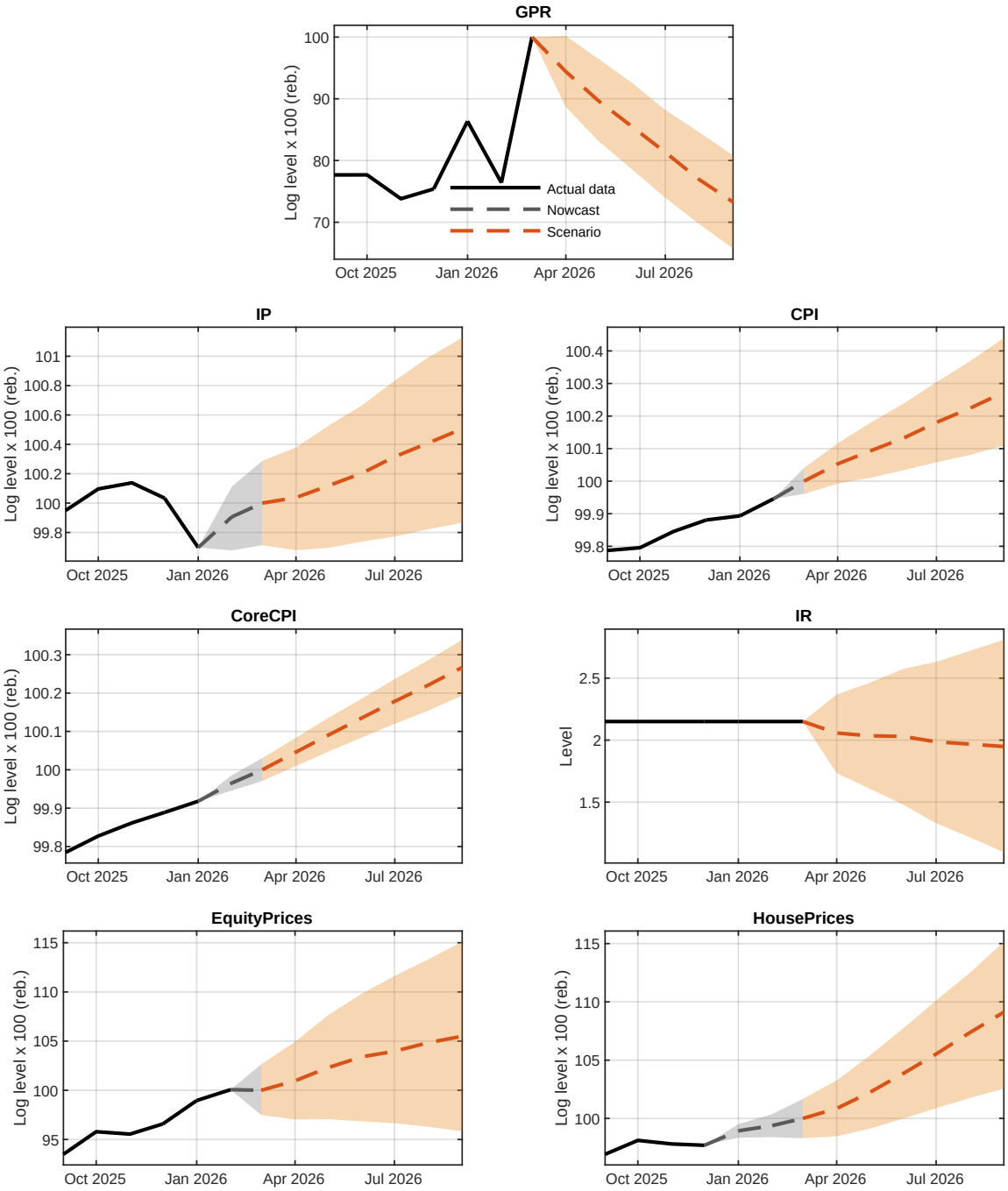

Figure H.1: Baseline structural scenario: gradual geopolitical de-escalation

Notes: The figure reports an extended structural scenario analysis based on Antolín-Díaz et al. (2021). The scenario assumes that the EA GPR index declines by 5% per month from its March 2026 level. Solid black lines show observed data, gray dashed lines show nowcasts for variables unavailable at the time of writing, and orange dashed lines show the structural scenario path conditional on the nowcast distribution for the end-March 2026 state. Variables in log-levels are rebased to 100 in March 2026. Shaded areas denote 68% credible bands.

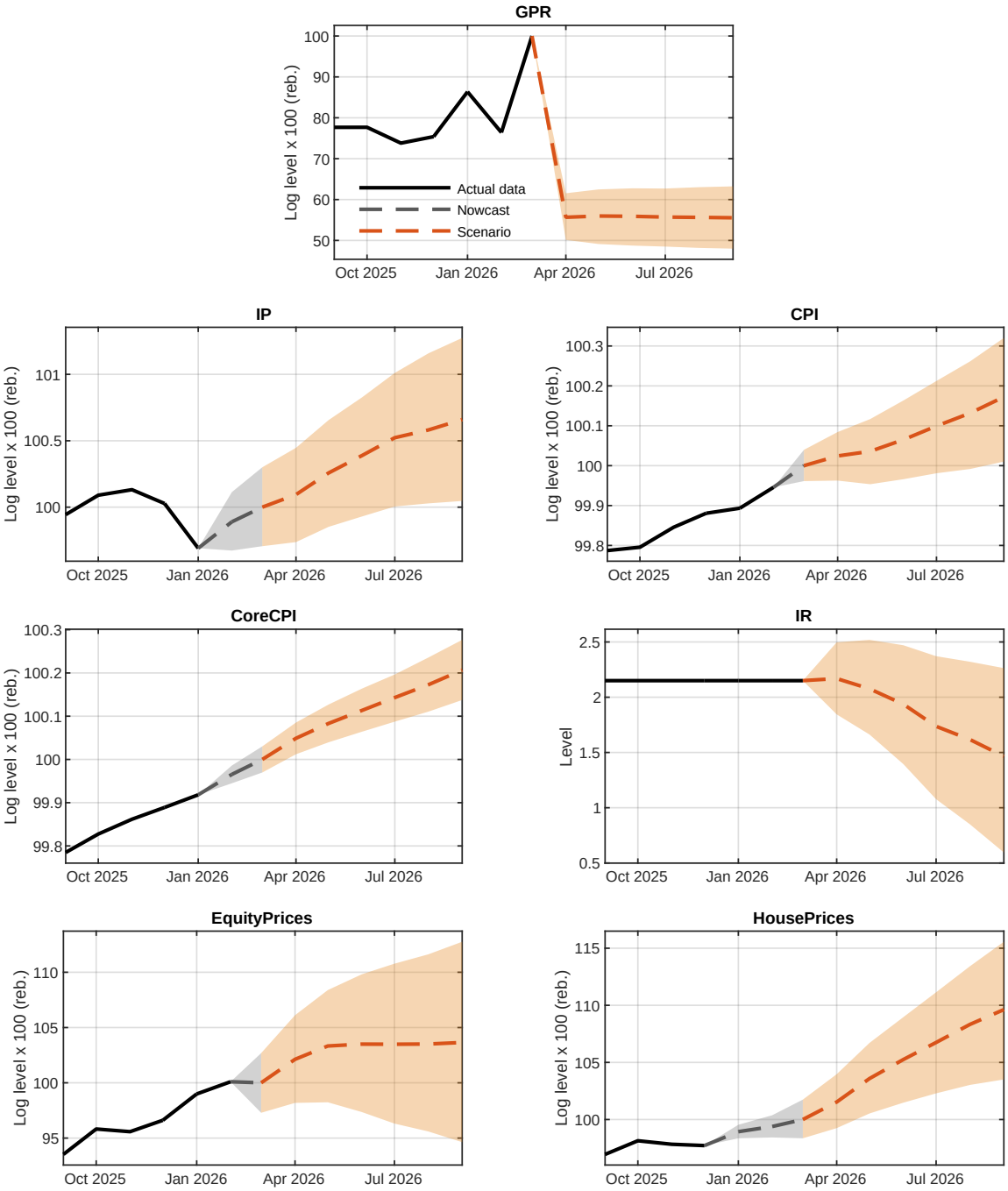

Figure H.2: Structural scenario: fast geopolitical de-escalation

Notes: The figure reports an extended structural scenario analysis based on Antolín-Díaz et al. (2021). The scenario assumes that the EA GPR index returns immediately to its unconditional mean in April 2026. Solid black lines show observed data, gray dashed lines show nowcasts for variables unavailable at the time of writing, and orange dashed lines show the structural scenario path conditional on the nowcast distribution for the end-March 2026 state. Variables in log-levels are rebased to 100 in March 2026. Shaded areas denote 68% credible bands.

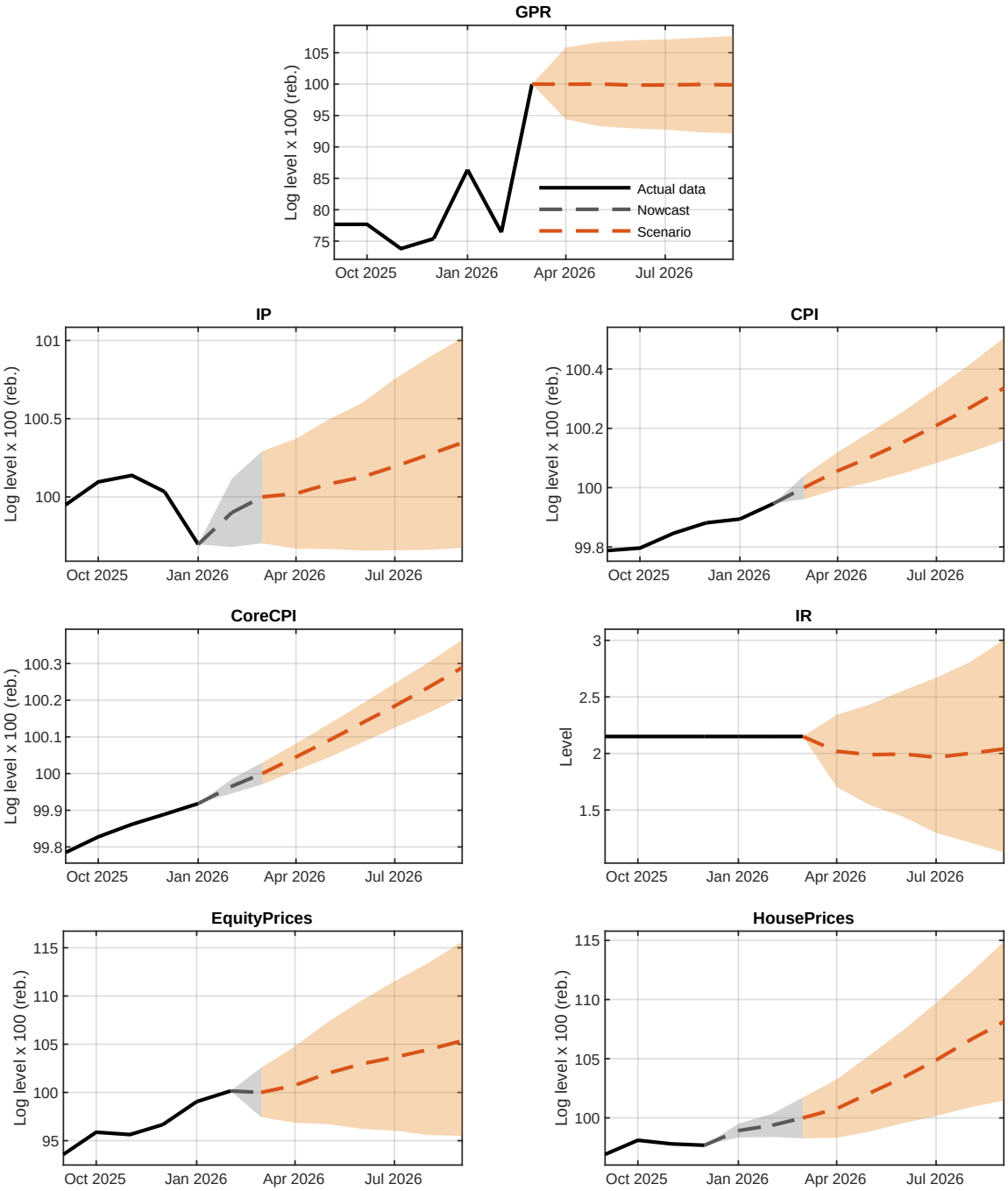

Figure H.3: Structural scenario: geopolitical escalation

Notes: The figure reports an extended structural scenario analysis based on Antolín-Díaz et al. (2021). The scenario assumes that the EA GPR index remains at its March 2026 level. Solid black lines show observed data, gray dashed lines show nowcasts for variables unavailable at the time of writing, and orange dashed lines show the structural scenario path conditional on the nowcast distribution for the end-March 2026 state. Variables in log-levels are rebased to 100 in March 2026. Shaded areas denote 68% credible bands.

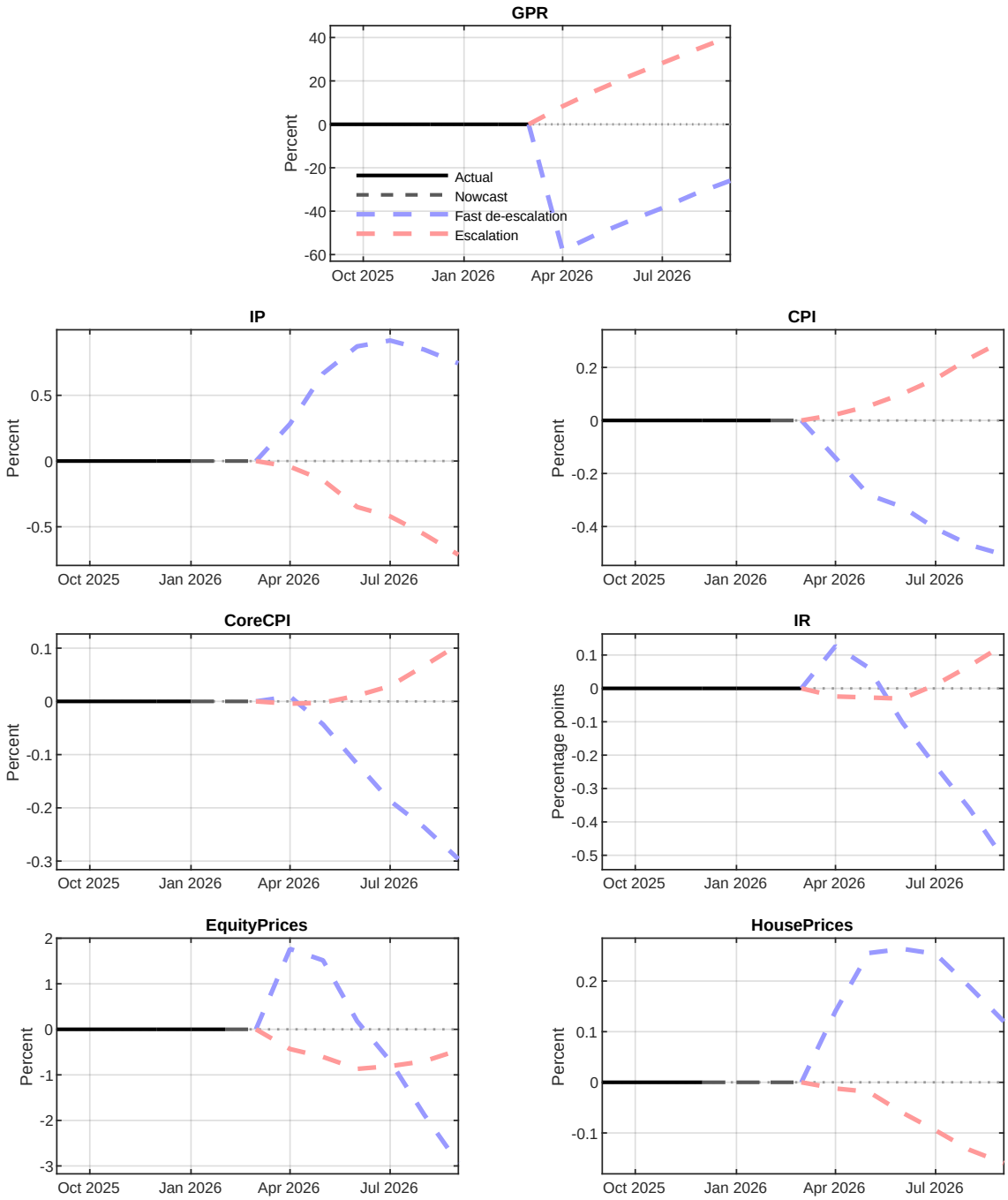

Figure H.4: Alternative geopolitical risk scenarios relative to the baseline

Notes: The figure reports deviations of the median paths under two alternative structural scenarios from the median path under the baseline gradual de-escalation scenario. The dashed blue line corresponds to the fast de-escalation scenario, in which the EA GPR index returns immediately to its unconditional mean in April 2026. The dashed red line corresponds to the escalation scenario, in which the EA GPR index remains at its March 2026 level throughout the scenario horizon.

I Search query for measuring sanctions intensity

Anglosphere

Search query for Sanctions intensity index: economic* AND sanction* AND (against OR concerning to) AND (Russia OR Syria OR Iran OR (North NEAR1 Korea) OR Venezuela OR Belarus)).

Germany

Search query for Sanctions intensity index: (Wirtschaftssanktion* OR Sanktion*) AND (Russland OR Syrien OR Iran OR Nordkorea OR Venezuela OR Weißrussland OR Belarus)).

France

Search query for Sanctions intensity index: economiqu* AND sanction* AND (contre OR concernant) AND (Russie OR Syrie OR Iran OR (Coree NEAR du Nord) OR Venezuela OR Bielorussie)).

Italy

Search query for Sanctions intensity index: econom* AND sanzion* AND (contro OR riguardo) AND (Russia OR Siria OR Iran OR (Corea NEAR1 del Nord) OR Venezuela OR Bielorussia)).

Spain

Search query for Sanctions intensity index: economic* AND sancion* AND (contra OR sobre) AND (Rusia OR Siria OR Iran OR (Corea NEAR1 del Norte) OR Venezuela OR Bielorrusia)).

The Netherlands

Search query for Sanctions intensity index: econom* AND sanctie* AND (tegen OR betreffende) AND (Rusland OR Syrie OR Iran OR (Noord NEAR1 Korea) OR Venezuela OR Wit-Rusland)).

J Search query for measuring shortages

Anglosphere

Search query for Shortages index: ((shortage* OR bottleneck* OR scarcit* OR rationing* OR constraint*) NEAR5 ((oil OR gas OR coal OR fuel* OR gasoline OR energy OR heating OR petroleum OR electricity OR refinery* OR pipeline* OR petrol) OR (food OR wheat OR meat OR milk OR crop* OR grain* OR agriculture OR farm* OR famine OR feed OR farmer* OR water OR fertilizer OR drought) OR (steel OR copper OR iron OR metal* OR automotive OR textile OR machinery OR equipment OR transportation OR railway OR airline OR freight OR shipping OR transit OR deliveries OR shipment* OR ship* OR chip* OR semiconductor* OR infrastructure OR materials OR distribution OR car* OR part* OR goods OR auto* OR computer* OR "supply chain" OR component*) OR (labor OR worker* OR job* OR employment OR manpower OR staff OR professional* OR technician* OR workforce OR personnel OR strike* OR union*)) AND (economic OR industr* OR production OR manufactur* OR economy OR trade OR commerce OR business OR budget OR tax OR fiscal OR corporation OR market OR price OR capacity OR company OR demand OR sales OR factory OR wages OR suppl*)).

Germany

Search query for Shortages index: ((Engpass* OR Mangel* OR Knappheit* OR Engpaess* OR Rationier* OR Rationierung*) near5 ((Oel* OR Gas* OR Kohle* OR Brennstoff* OR Benzin* OR Energie* OR Heizung* OR Erdoel* OR Strom* OR Raffinerie* OR Pipeline* OR Diesel* OR Tankstelle*) OR (Lebensmittel* OR Nahrung* OR Weizen* OR Fleisch* OR Milch* OR Ernte* OR Getreide* OR Landwirtschaft* OR Hungersnot* OR Futter* OR Bauer* OR Bauern* OR Wasser* OR Duenger* OR Duerre*) OR (Stahl* OR Kupfer* OR Eisen* OR Metall* OR Automobil* OR Textil* OR Maschinenbau* OR Ausruestung* OR Transport* OR Bahn* OR Fluglinie* OR Fracht* OR Schifffahrt* OR Transit* OR Lieferung* OR Sendung* OR Schiff* OR Chip* OR Halbleiter* OR Infrastruktur* OR Material* OR Distribution* OR Auto* OR Computer* OR Lieferkette* OR Komponenten*) OR (Arbeit* OR Arbeitskraeft* OR Beschaeftigt* OR Job* OR Beschaeftigung* OR Personal* OR Fachkraeft* OR Belegschaft* OR Arbeitnehmer* OR Streik* OR Gewerkschaft*)) AND (wirtschaft* OR Industrie* OR Produktion* OR Fertigung* OR Handel* OR Geschaeft* OR Haushalt* OR Steuer* OR Fiskal* OR Unternehmen* OR Markt* OR Preis* OR Kapazitaet* OR Firma* OR Nachfrage* OR Verkauf* OR Fabrik* OR Lohn* OR Angebot*)).

France

Search query for Shortages index: ((penurie* OR goulet* OR goulot* OR d'etranglement OR rarete* OR manque* OR rationnement*) near5 ((petrol* OR gaz* OR charbon* OR carburant* OR combustible* OR essence* OR energ* OR chauffage* OR electricite* OR raffinerie* OR pipeline* OR essence*) OR (aliment* OR ble* OR froment* OR viande* OR lait* OR recolte* OR cereale* OR ferme* OR exploit* OR agricult* OR famine* OR fourrage* OR agriculteur* OR cultivateur* OR eau* OR engrais* OR

secheresse*) OR (acier* OR cuivre* OR fer* OR metal* OR automobile* OR textile* OR machine* OR equipement* OR transport* OR chemin* OR "compagnie aerienne*" OR fret* OR expedition* OR transit* OR livraison* OR envoi* OR navire* OR bateau* OR puce* OR semi-conducteur* OR infrastructure* OR materiel* OR materiau* OR distribution* OR voiture* OR auto* OR piece* OR composant* OR marchandise* OR ordinateur* OR "chaine d'approvisionnement") OR (travail* OR travailleur* OR employe* OR salarie* OR ouvrier* OR emploi* OR metier* OR poste* OR "main d'oeuvre" OR personnel* OR effectif* OR professionnel* OR technicien* OR competence* OR greve* OR syndicat*)) AND (econom* OR industri* OR production* OR fabric* OR commerce* OR negoce* OR affaire* OR budget* OR impot* OR taxe* OR fiscal* OR entreprise* OR societe* OR marche OR prix* OR capacite* OR demande* OR vente* OR usine* OR salair* OR approvisionnement*)).

Italy

Search query for Shortages index: ((carenz* OR mancanz* OR "collo di bottiglia" OR scarsit* OR razionament*) near5 ((petroli* OR gas* OR carbon* OR carburant* OR benzina* OR energi* OR riscaldament* OR elettric* OR raffiner* OR oleodott* OR gasdott* OR metanodott*) OR (cib* OR aliment* OR nutriment* OR viver* OR gran* OR carn* OR latt* OR coltur* OR raccolt* OR cereal* OR "azienda agricola" OR fattori* OR tenut* OR agricoltur* OR caresti* OR mangim* OR agricoltor* OR contadin* OR acqu* OR fertilizzant* OR concim* OR siccit*) OR (acciai* OR ram* OR ferr* OR metall* OR automobil* OR tessil* OR macchinar* OR attrezzatur* OR trasport* OR ferrovi* OR "compagnia aerea" OR merci* OR spedizion* OR transit* OR consegn* OR nav* OR chip* OR semiconduttor* OR infrastruttur* OR material* OR distribuzion* OR auto* OR macchin* OR component* OR "pezzi di ricambio" OR part* OR merc* OR computer* OR filiera* OR "catena di approvvigionamento" OR "catena di fornitura" OR "catena logistica") OR (manodopera OR lavor* OR occupazion* OR impieg* OR personal* OR "forza lavoro" OR operai* OR dipendent* OR staff OR professionist* OR tecnic* OR competenz* OR capacit* OR abilit* OR "risorse umane" OR scioper* OR sindacat*)) AND (econom* OR industr* OR produzion* OR manifattur* OR costru* OR commerci* OR affar* OR impres* OR aziend* OR ditt* OR budget* OR bilanci* OR stanziament* OR tass* OR fiscal* OR finanziar* OR societ* OR mercat* OR prezz* OR capac* OR domand* OR vendit* OR fatturat* OR fabbric* OR stabiliment* OR salar* OR offert* OR offr*)).

Spain

Search query for Shortages index: ((escase* OR "cuello de botella" OR carencia* OR falta* OR racionamient*) near5 ((petrole* OR gas* OR carbon* OR combustible* OR gasolina* OR energ* OR calefaccion* OR electricidad* OR refiner* OR oleoduct* OR gasoduct* OR conduct* OR pipeline*) OR (aliment* OR trigo* OR carne* OR leche* OR cultiv* OR cosech* OR cereal* OR grano* OR agricult* OR hambrun* OR pienso* OR granjer* OR agu* OR fertilizant* OR sequi*) OR (acero* OR cobre* OR hierro* OR metal* OR automotriz* OR automovil* OR textil* OR maquin* OR equip* OR transport* OR ferrocarril* OR aeroline* OR carg* OR "transporte maritimo" OR transito* OR entrega* OR suministro* OR envio* OR buqu* OR chip* OR semiconductor* OR infraestructur* OR material* OR distribucion* OR coche* OR automovil* OR carro* OR pieza* OR parte* OR mercanc* OR bien* OR ordenador*

OR computadora* OR "cadena de suministro" OR component*) OR (labor* OR trabaj* OR emple* OR "mano de obra" OR plantill* OR personal* OR profesional* OR tecnic* OR habilidad* OR competenc* OR "fuerza laboral" OR huelg* OR sindic*)) AND (econom* OR industri* OR produccion* OR manufactur* OR comerci* OR negoci* OR presupuest* OR impuest* OR fiscal* OR empres* OR mercad* OR preci* OR capacid* OR compan* OR demand* OR vent* OR fabric* OR salari* OR sueld* OR suministr*)).

Netherlands

Search query for Shortages index: ((tekort* OR schaarst* OR gebrek* OR rantsoenering* OR knelpunt*) near5 ((olie* OR gas* OR steenkool* OR kol* OR brandstof* OR benzine* OR energie* OR verwarming* OR elektriciteit* OR raffinaderij* OR pijpleiding* OR petroleum* OR diesel*) OR (voedsel* OR graan* OR vlees* OR melk* OR oogst* OR gewas* OR landbouw* OR hongersnood* OR voer* OR boer* OR water* OR meststof* OR droogte*) OR (staal* OR koper* OR ijzer* OR metaal* OR autoindustrie* OR textiel* OR machinebouw* OR apparatuur* OR transport* OR spoorweg* OR luchtvaartmaatschappij* OR vracht* OR scheepvaart* OR levering* OR zending* OR schip* OR chip* OR halfgeleider* OR infrastructuur* OR materiaal* OR distributie* OR auto* OR computer* OR "toeleveringsketen*" OR component*) OR (arbeid* OR werknemer* OR werk* OR baan* OR personeel* OR arbeidskracht* OR beroepsbevolking* OR vakbond* OR staking* OR professional* OR technicus* OR vaardigheid*)) AND (econom* OR industri* OR productie* OR fabricage* OR economie* OR handel* OR bedrijf* OR begroting* OR belasting* OR fiscaal* OR onderneming* OR markt* OR prijs* OR capaciteit* OR vraag* OR verkoop* OR fabriek* OR loon* OR aanbod*)).

K Consequences of GPR: sanctions and shortages

Impulse Responses to a GPR shock with sanctions channel

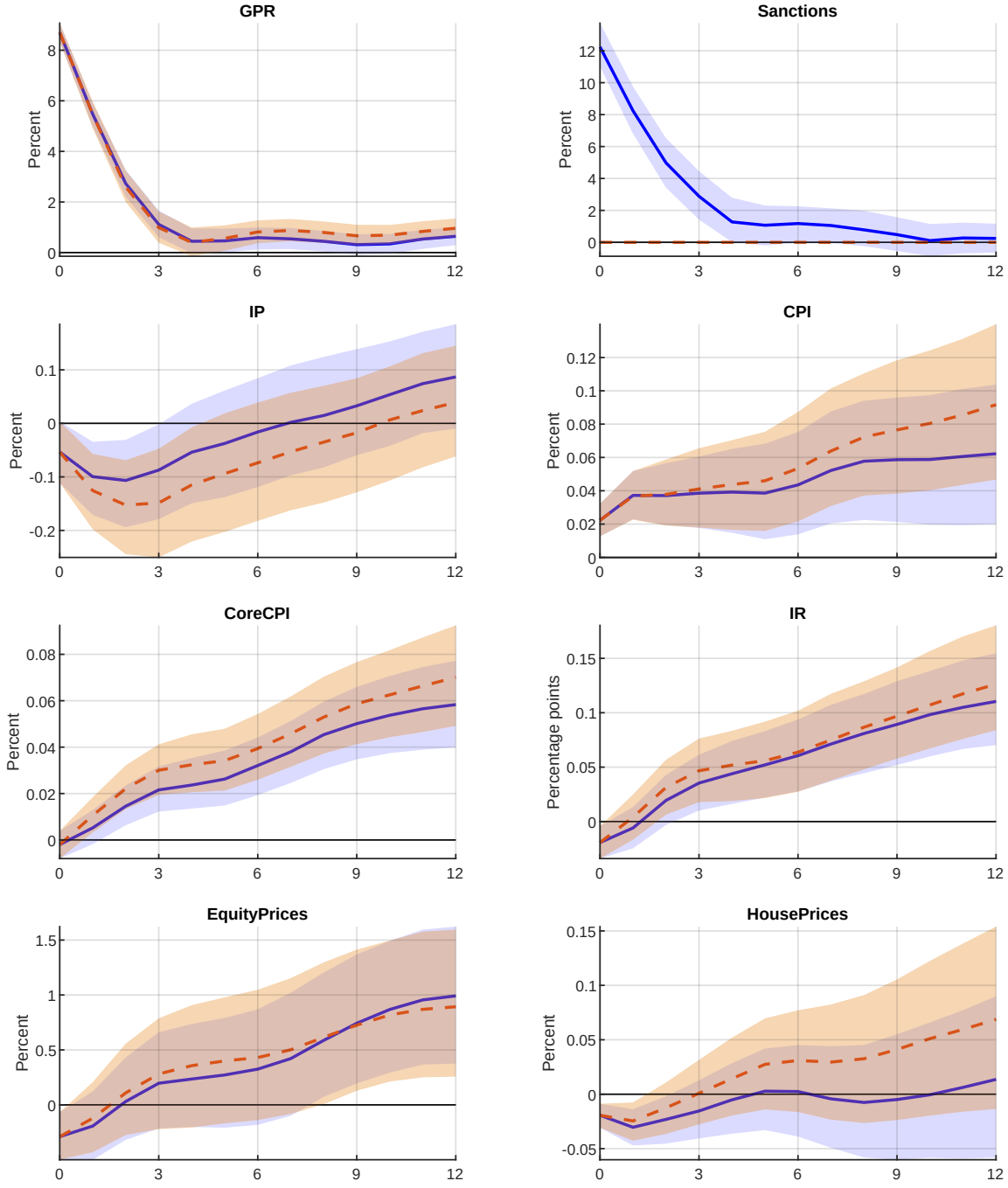

Figure K.1: Impact of Euro Area GPR shock with sanctions channel: active (solid line) and non-active (dashed line)

Notes: Impulse responses based on Bayesian vector autoregression (VAR) with Cholesky identification. The VAR uses the Euro Area GPR index and the Euro Area sanctions intensity index. Shaded areas denote 68% credible intervals.

Sanctions intensity indices for five euro area countries

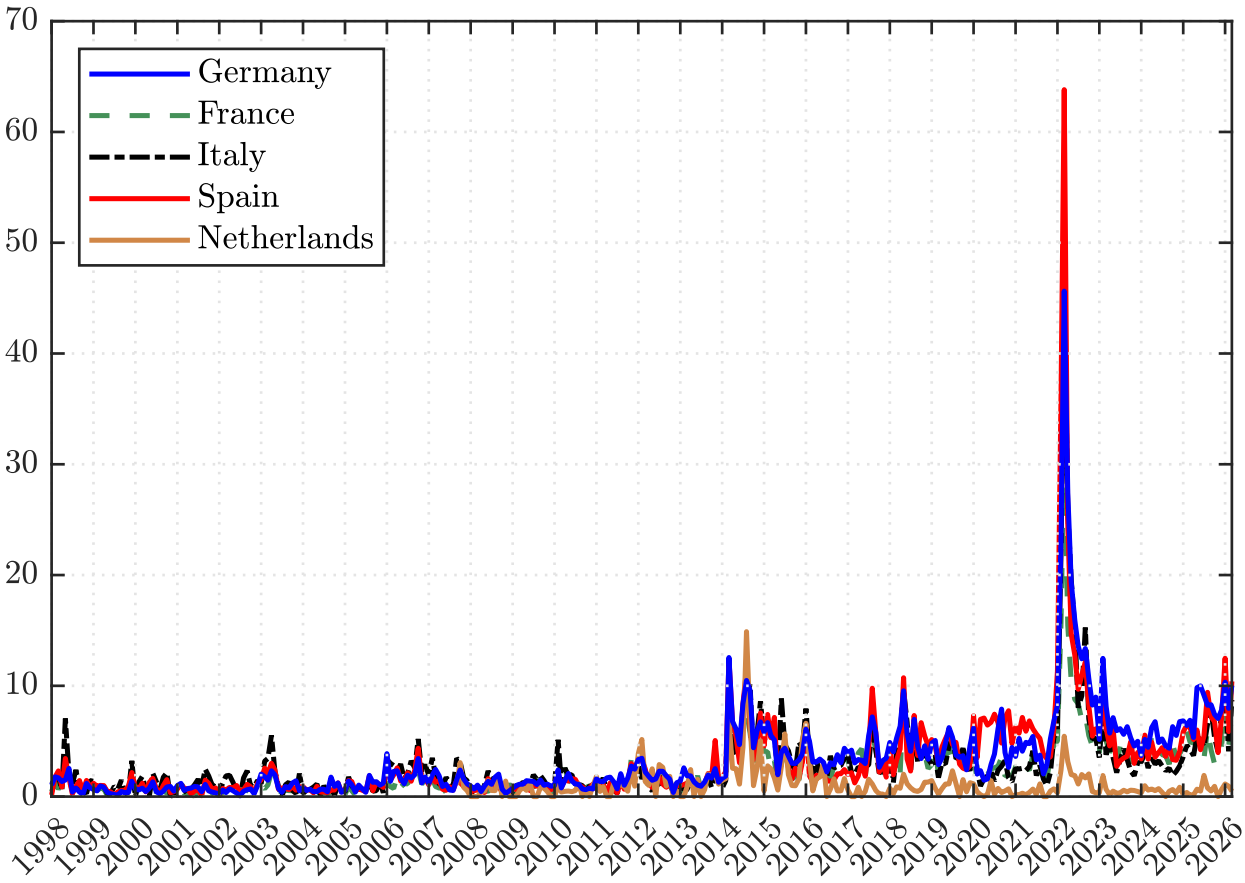

Figure K.2: Sanctions intensity indices for five euro area countries

Notes: All series are standardized following the same methodology applied to our EA GPR index, and for comparability are rescaled to equal 1 in January 2010.

Shortages indices for five euro area countries

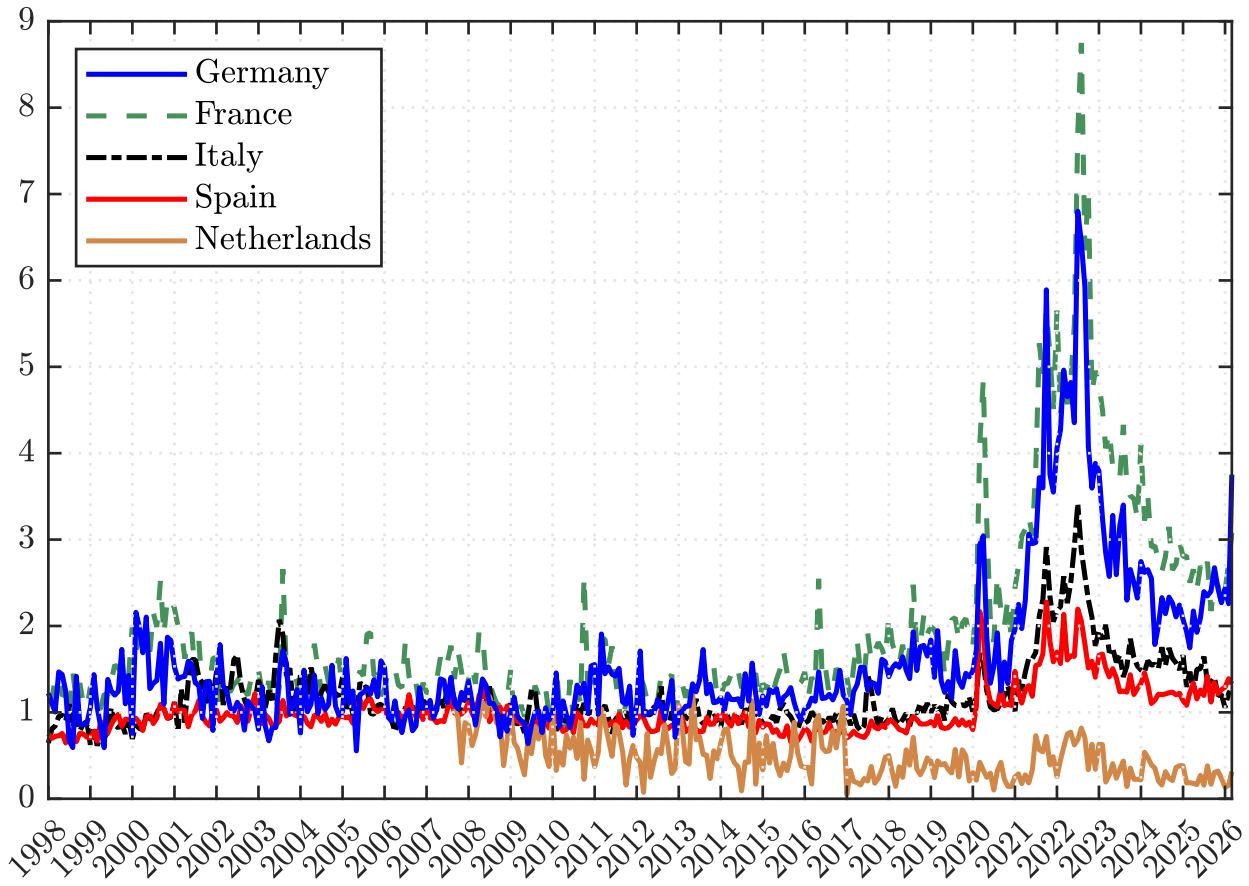

Figure K.3: Shortages indices for five euro area countries

Notes: All series are standardized following the same methodology applied to our EA GPR index, and for comparability are rescaled to equal 1 in January 2010.

European Commission Business Survey

The European Commission Business Surveys cover the manufacturing, construction, and services sectors and are conducted on a quarterly basis. Responses from the services sector are excluded, as data for this sector are only available starting in 2003Q3. Owing to this limited availability, we restrict our analysis to the manufacturing and construction sectors. Firms are asked to respond to the following questions. For manufacturing firms:

Q8. What main factors are currently limiting your production? (quarterly frequency)

- *none*
- *insufficient demand*
- *shortage of labour force*
- *shortage of material and/or equipment*
- *financial constraints*
- *other factors*

For construction firms:

Q2. What main factors are currently limiting your production? (monthly frequency)

- *none*
- *insufficient demand*
- *weather conditions*
- *shortage of labour force*
- *shortage of material and/or equipment*
- *financial constraints*
- *other factors*

The EC releases sector-specific response shares expressed as percentages and reported in non-seasonally adjusted terms. We construct our measure by averaging the percentage of firms reporting "shortage of labour force" and "shortage of material and/or equipment" in the manufacturing and construction sectors.

Raw data are available here: https://economy-finance.ec.europa.eu/economic-forecast-and-surveys/business-and-consumer-surveys/download-business-and-consumer-survey-data/time-series_en#all-surveys.

Impulse Responses to a GPR Shock with shortages channel

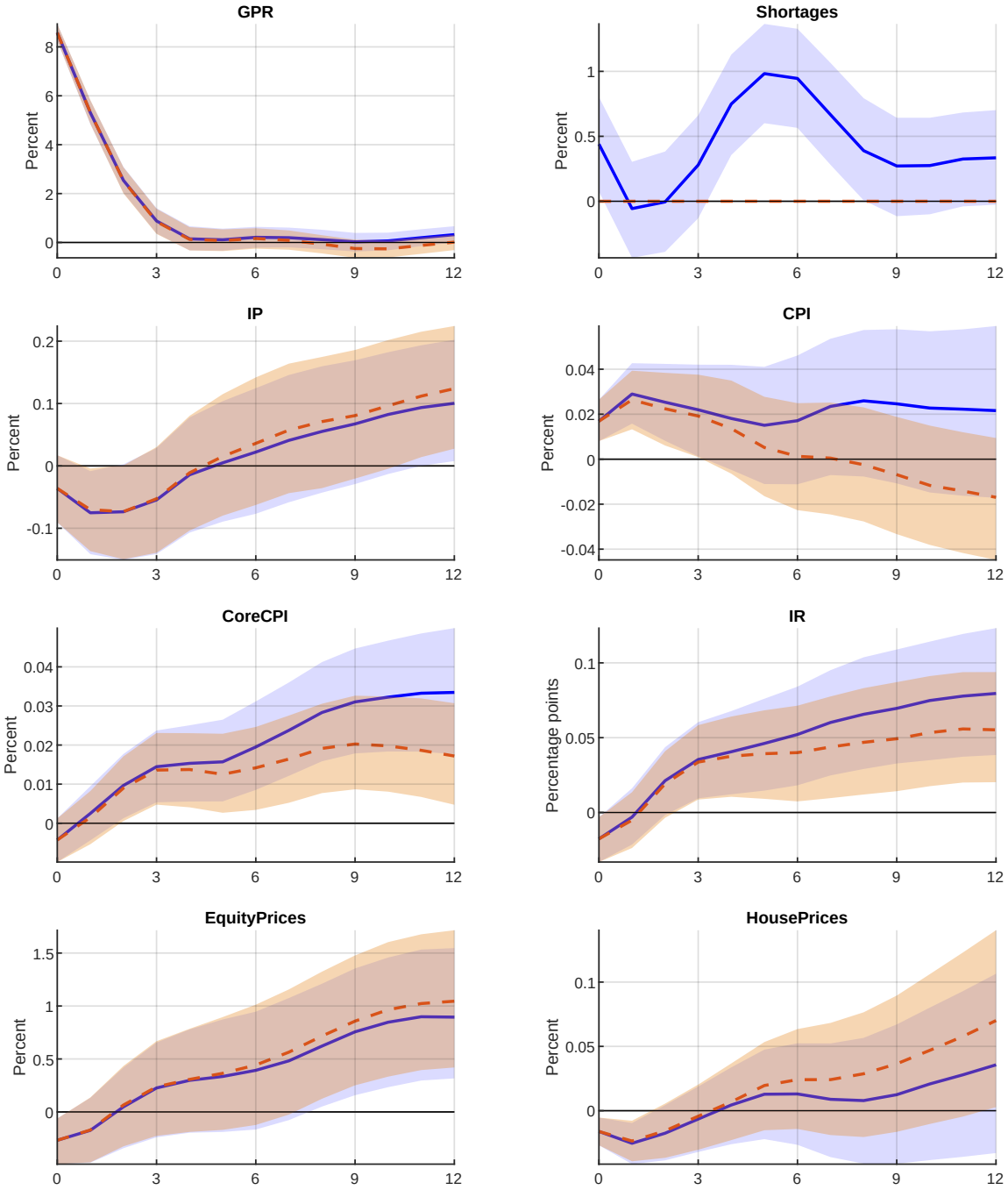

Figure K.4: Impact of EA GPR shock with shortages channel: Active (solid line) and non-active (dashed line)

Notes: Impulse responses based on Bayesian vector autoregression (VAR) with Cholesky identification. The VAR uses the EA GPR index and the EA shortages index. Shaded areas denote 68% credible intervals.