MACROECONOMIC EXPECTATIONS IN A WAR

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Abstract: Using short- and long-term macroeconomic forecasts, we estimate the cost of the Russian full-scale invasion of Ukraine for countries in Eastern Europe, Caucasus, and Central Asia. Shortly after the Russian attack, the projected cost (cumulative over six years) stood at $2.44 trillion for the region. Professional forecasters predicted a dramatic increase in macroeconomic uncertainty, significant spillover effects, some hysteresis effects as well as a changing nature of business cycles. We also use the war shock to study how professional forecasters acquire and process information. Our results point to state dependence as well as an important role of forward information in shaping macroeconomic outlook of professional forecasters.

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I. Introduction

Russia's full-scale invasion of Ukraine in 2022 marked an end to stability in Europe and beyond and fundamentally alternated the global order thus unleashing a wave of political and economic realignments. Indeed, the end of the Cold War cemented the idea that a large-scale European war to the likes of which we now see today would be inconceivable, shaping the foundation of economic cooperation and defense policies. The awakening to the full-scale war radically altered these beliefs as the war-related shocks impacted the world and especially Europe which has been particularly exposed to Russian threats and blackmail. The ongoing nature of the war makes it difficult to fully comprehend its full ramifications, but the immediately observed consequences demand a comprehensive analysis and at least provisional estimates.

To this end, we examine how professional forecasters revise their macroeconomic expectations to the outbreak and evolution of the war. In doing so we address the following key questions: What are the short- and long-term economic effects for Ukraine and Russia, and to what degree are neighboring nations impacted by spillover effects? How does the war change uncertainty in the macroeconomic outlook? How should authorities respond to the economic shock? What is the cost of the war?

To address these questions, we use forecasts collected by Consensus Economics that gives short-term individual-level forecast and long-term aggregate forecasts for 29 countries in Eastern Europe, Caucus, and Central Asia. The high frequency and long time series of the dataset allow us to compare and contextualize the shift in macroeconomic expectations after Russia's 2022 invasion with its 2014 illegal annexation of Crimea and partial occupation of the Donbas as well as other major events, such as the 2008-2009 Global Financial Crisis (GFC) and COVID-19 pandemic. By using real-time macroeconomic forecasts rather than actual data, we of course provide only estimates, which may be revised significantly later. On the other hand, realized data are "rear-mirror information" that becomes available with long delays, while forecasts permit real-time analysis thus making it more appealing for policymaking.

With these tradeoffs in mind, we document a number of important facts. First, the full-scale invasion led to large revisions in macroeconomic forecasts for Ukraine and Russia, with the largest effects concentrated within the short term but the long-term outlook is affected too. Other countries in the region are also influenced but to a smaller extent—although the magnitude of the shock is comparable to calamities such as the GFC and COVID-19. In particular, countries closer

to the conflict have larger negative revisions in outlook than more distant countries. At the same time, we show that projected macroeconomic trends for Russia and Ukraine diverge from those for other countries and hence there is a sign of the region economically decoupling from the belligerents. We also show that, according to professional forecasters, the war is likely to result in a negative hysteresis effect (i.e., a persistent slowdown of economic growth) for Russia but limited hysteresis effects for Ukraine (likely due to rapid post-war reconstruction) and Eastern Europe.

Second, we use revisions in long-term GDP forecasts to assess the cost of war for Ukraine, Russia and other countries. Shortly after the full-scale invasion, professional forecasters projected that, over six years, Ukraine and Russia would cumulatively lose 193% and 92% of their respective GDP in 2021. Although the losses for other countries are smaller, the total cost for the region was projected at US$2.44 trillion, with larger losses to countries that are potentially more exposed to Russian aggression. Our analysis of Russian aggression in 2014 and alternative estimates for the cost of war suggest that the cost-of-war estimates implied by macroeconomic forecasts in Consensus Economics likely understate the true cost (perhaps because professional forecasters did not expect the war to last a long time). We also observe that countries with larger (potential) losses increase their defense spending, which suggests active preparation to a possible wider conflict on the continent.

Third, we show that, on the net, the full-scale war was initially a stagflationary shock: expected output contraction was accompanied by higher expected inflation. This is an important result because there are many forces that can push inflation and output in the same or opposite directions. For example, we document that the war considerably raised macroeconomic uncertainty which is often interpreted as a demand-side shock (i.e., uncertainty widens bands of inaction thus depressing demand; as a result, inflation and output should have a positive correlation). On the other hand, the war raises the cost of doing business (including higher energy prices), a supply-side factor that should generate a negative correlation between inflation and output. This presents a clear challenge for macroeconomic stabilization as policymakers are not well equipped to deal with supply-side shocks and especially so after a period of high inflation (Coibion and Gorodnichenko 2025). As the conflict morphed into a war of attrition, the demand-side factors such as massive military spending appear to dominate. This shift opens more opportunities for macroeconomic management.

Finally, we use the war shock to shed light on more academic questions such as how economic agents collect and process information as well as the nature and degree of information rigidities. We document that the war reduces the degree of information rigidity. Consistent with

this conclusion, we observe that professional forecasters revise their expectations dramatically after observing the shock, there is a large increase in disagreement, and forecasters revise their beliefs towards consensus forecasts faster. At the same time, as the war continues, information rigidity has been moving towards pre-war levels. While somewhat surprising (the war takes many turns and thus the outcome is unpredictable), one may interpret this pattern as suggesting that forecasters settle on a narrative (e.g., "war of attrition") which can be dislodged only by another major shock. We also document that forward information (i.e., news about future developments and policies) play a large role in shaping macroeconomic expectations in the region.

Our work contributes to several strands of research. First, our paper builds on the emergent literature at the intersection of economics, political science, national security and international relations. This "geoeconomics" literature (e.g., Caldara and Iacoviello 2022, Fernandez-Villaverde, Mineyama, and Song 2024) is highly diverse and broad in its analysis of spillovers (e.g., Glick and Taylor 2010, De Groot 2010, Qureshi 2013), sanctions (e.g., Morgan, Syropoulos, and Yotov 2023), etc. The closest paper is Federle et al. (2024) that uses historical data to estimate macroeconomic effects of wars. While our analyses agree that wars are very costly, we use a different, forward-looking approach that allows us to construct cost-of-war estimates country by country in real time. This is a cheap and fast alternative to the gold standard in the profession, such as World Bank's Rapid Damage and Needs Assessment reports.

Second, we contribute the work focused on studying the sources and persistence of macroeconomic fluctuations. In a seminal contribution, Blanchard and Summers (1986) observed that presumably transitory shocks may have (nearly) permanent effects on the economy, i.e., the economy can exhibit hysteresis. While most of this work has focused on economic shocks (e.g., financial, monetary or fiscal shocks; see Cerra, Fatás, and Saxena 2023 for a survey), relatively little is known about the long-run effects of wars and economic theory offers conflicting predictions. For example, consistent with the standard Solow growth model, Miguel and Roland (2011) show that destruction of capital during the Vietnam war had few long-term effects on the affected areas as capital was rebuilt and economic development caught up to the balanced growth path. On the other hand, Acemoglu, Hassan, and Robinson (2011) show that wars can have highly persistent effects on development, which is consistent with the predictions of endogenous growth models. Relative to this literature, we show that long-term macroeconomic forecasts are clearly

affected by war, which suggests a hysteresis effect. To be clear, while forecast horizons available to us are relevant for policymaking, they are not long enough to firmly establish such an effect.

Finally, our work is related to the rapidly growing literature on how information frictions shape economic agents' expectations, aggregate dynamics, and policy (Coibion, Gorodnichenko, and Kamdar 2018, Maćkowiak, Matějka, and Wiederholt 2023). Building on Coibion and Gorodnichenko (2012, 2015), Goldstein (2023), and Goldstein and Gorodnichenko (2022), we use large, war-related shocks to understand information frictions. Our results point to state-dependence in acquisition and processing of information as well as an important role of forward information.

The rest of the paper is structured as follows. Section II describes Consensus Economics data. The following two sections provide historical context for Russian aggression and Russo-Ukrainian relations (Section III) and macroeconomic developments in the region (Section IV). Section V provides cost-of-war estimates as well as changes in macroeconomic dynamics projected by professional forecasters after Russia attacked Ukraine in 2014 and 2022. Section VI studies how the war affects macroeconomic uncertainty. Section VII examines spillover effects from the war to non-belligerent countries in the region. Section VIII investigates how macroeconomic forecasts comove during wars, other crises, and normal times to shed more light on what may be needed to achieve macroeconomic stabilization. Section IX focuses on hysteresis effects. Section X analyzes information rigidities. Section XI concludes.

II. Data

In addition to the International Monetary Fund's International Financial Statistics (IMF IFS) and the World Bank's World Development Indicators (WDI)—standard datasets for realizations of macroeconomic variables—we use surveys of professional forecasts done by Consensus Economics which provides comprehensive datasets of macroeconomic forecasts covering 29 countries in Eastern Europe, Caucasus, and Central Asia. The forecasts are split into Short-Term and Long-Term datasets which have different features, variables, and time horizons.

A. Short-Term Dataset

The Short-Term Consensus Economics dataset began in November 1990; however, the record collection for individual forecasters differs between country and variable (Appendix Table 1). For most countries, the individual forecaster data is available consistently from May 1998 onward. The

frequency of the Consensus Economics surveys of professional forecasters was initially bi-monthly but starting in May 2007, the frequency is monthly.

The Short-Term dataset includes the following macroeconomic indicators. Real Gross Domestic Product (GDP), Consumer Price Index (CPI) Inflation, Consumption, Investment, Production, Wages, and Money Supply (M2) are all reported as year-on-year percent changes. Budget Balance is expressed as a percentage of GDP. Merchandise Exports, Merchandise Imports, Trade Balance, and Current Account are all reported in USD billions, with exports and imports being reported as Free on Board (FOB). The 3 Month Interbank Rate and 10-Year Government Bond Yields are reported as percentage yields.

Every Short-Term forecast contains two horizons: current calendar year ($year_0$) and the next calendar year ($year_1$). Using this information, we construct 12-month-head forecasts as weighted averages of $year_0$ and $year_1$: $forecast = [12 - (m - 1)] \times year_0 + [m - 1] \times year_1$ where m is the month when the survey wave of Consensus Economics was published. Note that for January releases of Consensus Economics, $forecast = year_0$.

The key advantage of the Short-Term dataset is the inclusion of individual professional forecasters. The dataset reports the names of each forecaster and their respective projections for each horizon. However, the number of forecasters varies significantly across countries, variables, and time. Some countries have large panels with many professional forecasters, while others—specifically during the earlier years or less popular variables (e.g., trade balance)—could be sparsely populated.[1] Because some of our analyses utilize data for individual forecasters, our baseline sample is restricted to counties that consistently have 10 or more forecasters. This means that our "core" sample covers large/developed Eastern European countries (Czechia, Poland, Estonia, Latvia, Lithuania, Ukraine, Romania, Bulgaria, Slovenia, Croatia, Hungary, Slovakia, and Russia) and excludes countries in Central Asia, Caucasus, and some former Yugoslavia countries.

B. Long-Term Dataset

The Long-Term dataset for Eastern Europe began in May 1998 and is updated quarterly (semi-annually before 2014), though the exact start date differs across countries (Appendix Table 1). Long-Term forecasts for the larger or more advanced economies (e.g., Czechia, Ukraine) started

[1] Appendix Figure 10 plots time series of a unique number of forecasters faceted across countries for Consumer Price Inflation and GDP.

in 1998. Another cohort of countries (e.g., Bulgaria, Croatia, Estonia) were added in 2007, and the rest were added in 2019 (e.g., Moldova, Kazakhstan), or later (e.g. Montenegro, Kosovo). Thus, this dataset covers the same 29 countries as the Short-Term dataset though long-term forecasts are only available for GDP, CPI Inflation, Consumption, Current Accounts, Investment, and Industrial Production. The forecasts are reported for calendar years: annually for year zero (current year in the survey date) through year five as well as averages for years six through 10.

The Long-Term dataset provides the following moments: Consensus (mean), High (max), Low (min), and Standard Deviation Values across time periods and respective forecasts. Unlike the Short-Term dataset, the Long-Term dataset does not include the individual professional forecasters. In some cases, for longer horizons, there are an insufficient number of forecasters to form a consensus and the cells are marked as "not available."

III. A Brief History of Russian Aggression Against Ukraine

The Kremlin has had hard time accepting Ukraine's independence. Indeed, almost immediately after Ukraine re-gained independence in 1991, Moscow questioned the borders and other elements of Ukraine's sovereignty. For example, in 1993-1994 various Russian politicians traveled to Crimea to support separatist efforts of Yuriy Meshkov, a pro-Russia, self-proclaimed president of Crimea. After Ukrainian authorities arrested Meshkov and declared particularly aggressive Russian politicians *persona non grata*, cessation forces largely disbanded. As early as 1992, Russian President Boris Yeltsin insisted on the presence of the Russian fleet in Sevastopol and threatened to "renegotiate" borders. This issue was resolved by the Russo-Ukrainian Friendship Treaty and additional agreements in 1997 that allowed the fleet to stay in Sevastopol until 2017. In 2003, Russia launched a construction project to connect Russia's mainland to Tuzla, a Ukrainian island in the Kerch straight. This gross provocation was ended after Ukrainian President Leonid Kuchma visited the island and vowed to protect it with all necessary force.

The relationship soured further after the Orange Revolution of 2004 when pro-Russian candidate Viktor Yanukovych (who was convicted twice for minor crimes in the Soviet times) lost presidential elections to pro-Western candidate Viktor Yushchenko. President Yushchenko was a key member of the coalition that supported Georgia after Russia invaded that country in 2008.

Yanukovych had a revanche in the 2010 elections. He pushed through the Parliament an agreement (also known as the "Kharkov Pact") to extend the stay of the Russian fleet in Sevastopol

until 2042 in exchange of a discount for Russian gas. His policy of closer relations with Russia culminated in 2013 when he refused to sign a comprehensive trade agreement with the European Union (EU) in exchange of a large Russian loan to support his government. Peaceful protests were met with unbridled policy brutality, and public outrage at police beating students and utter corruption was a turning point that started the Revolution of Dignity (also known as the Euromaidan). Yanukovych unleashed even more violence (at least 100 protesters were killed by snipers and riot police), but this led to his downfall, and he fled to Russia in February 2014.

Using chaos and confusion during the post-Yanukovych transition of power, Russia moved in on Crimea to occupy the local parliament using "green men" (Russian military forces without insignia) and its local agents. On February 27, 2014, under the threat of guns, the Crimean parliament was forced to vote for "independence" from Ukraine. Then Russia engineered a sham referendum in Crimea to declare independence from Ukraine and to join Russia. Although the United Nations (UN) General Assembly and many countries condemned the referendum, Moscow quickly satisfied the "free will" of Crimeans to join Russia. For the first time since World War II, a European border was changed by force, thus violating not only the UN Charter but also the Helsinki Final Act of 1975. And yet, the punishment of Russia was only symbolic (e.g., Russia was expelled from G8 group). Furthermore, as Ukraine tried to restore order in Eastern Ukraine in spring-summer 2014, the Russian army supported pro-Yanukovych forces and directly attacked Ukrainian army. Newly elected Ukrainian President Petro Poroshenko had to sign multiple agreements (so called Minsk-1 and Minsk-2 accords) with Russia to freeze the conflict at the existing contact lines. Effectively, this allowed Russia to occupy a part of the Donbas, including two major cities Luhansk and Donetsk. However, Russia did not formally absorb this territory and hence the occupied Donbas was formally a collection of "independent" republics ("DNR" and "LNR") run by Russian puppets and plagued by lawlessness, violence, and poverty. Again, Russia was barely punished for its aggression. Between late 2014 and 2021, the low intensity conflict continued at the contact line in the Donbas. More than 30 ceasefires were violated by the pro-Russian forces. During this period, Ukraine received no military aid from the EU, US, or other countries.[2]

Weakened by the war, Ukraine went through a series of severe economic crises (more than 45 banks went bankrupt, the currency depreciated 70%, and GDP contracted by almost 20%). However, an ambitious program of reforms supported by a large loan from the IMF set the country

[2] Havlik et al. (2020) estimated that the economic cost of Russian occupation of the Donbas was at least $21.7 billion.

on a recovery course. President Poroshenko signed a trade agreement with the EU and allowed visa-free travel between Ukraine and the EU. Although the pro-EU alignment was helpful for economic growth, the threat of future Russian aggression weighed heavily on Ukraine (e.g., foreign direct investment into Ukraine remained low). In 2019, Volodymyr Zelensky overwhelmingly won presidential elections on the platform of repairing relations with Russia. Negotiations between Zelensky and Russian President Vladimir Putin went nowhere.

In March-April 2021, Russia started to amass troops on the border with Ukraine. In July 2021, Putin published his historical take on Ukraine, which essentially denied the existence of Ukraine. In December 2021, US President Joseph Biden announced Russia's plan to invade Ukraine and promised to impose economic sanctions on Russia. After a flurry of diplomatic efforts to diffuse the invasion failed, Biden and other Western leaders shipped limited military aid (e.g., anti-tank missiles) to Ukraine while Russia continued to deny intentions to invade Ukraine. In the early hours of February 24, 2022, Putin ordered Russian troops to invade Ukraine to "demilitarize and denazify" the country. The Russian three-day plan was to decapitate[3] the Ukrainian government and install a pro-Russian puppet government. The heroic resistance of Ukrainians thwarted this plan with Russian forces being pushed out from Kyiv and failing to fully capture the Donbas region. The exact toll of the ongoing war is unknown but various metrics point to a grim picture. Millions of Ukrainians are internally displaced (~4 million) or refugees in other countries (~9 million). Preliminary estimates from the World Bank (2025) and other sources (Becker et al. 2022, 2025, Gorodnichenko, Sologoub, and Weder di Mauro 2022) suggest that the damages amount to at least $500 billion. At the same time, Ukraine became a candidate country for the EU and, since June 2024, Ukraine has been negotiating its accession to the Union. According to the Kiel Ukraine Support Tracker (Trebesch et al. 2023), Ukraine has received €327 billion in economic and military aid as of April 2025.

IV. Macroeconomic Trends and Forecasts for Eastern Europe

Since the 1990s Eastern Europe's macroeconomic landscape has been defined by structural transformation and economic crises. Figure 1 shows that the core-sample countries had a lot of comovement and volatility.[4] For example, after recovering from the Russian default in 1998 which

[3] The plan included "kill lists" of Ukrainian activists, politicians, etc.
[4] Time series for non-core countries are reported in Appendix Figure 11.

was a significant negative regional shock, Eastern European countries had a period of disinflation and rapid economic growth which was fueled by strong capital flows into the region (particularly for EU candidates and then admitted countries) as well as high commodity prices (particularly for Russia and Ukraine). The GFC of 2008-2009 punctuated this trajectory and resulted in deep contractions and high inflation, although the degree varied from an economic catastrophe (e.g., Ukraine, Russia, Hungary) to a slowdown (Poland). Russia's illegal annexation of Crimea and the partial occupation of the Donbas led to a spike in inflation and a deep recession in Ukraine and, to a smaller degree, Russia. In addition to the Western sanctions, the collapse of oil prices from ~$100 in August 2014 to ~$50 in February 2015 served as a key driver to Russia's decline in GDP growth. The COVID-19 crisis negatively affected all countries. The Russian full-scale invasion of Ukraine in 2022 was another negative shock which was concentrated in Ukraine and Russia but was also felt in other countries in the region.

Panel B shows that since the highly volatile and inflationary periods during the 1990s and early 2000s, Eastern Europe has experienced a gradual disinflation. Ukraine and Russia had both made significant progress in controlling inflation and were able to do so relatively quickly, albeit converging at an overall greater rate than other countries reflecting their respective inflation targets.[5] Panel C documents that in contrast to other Eastern European countries, Russia has consistently run current account surpluses since 2000, but many countries in the region switched to surpluses after 2010. In terms of budget balances, most countries (again Russia is an exception) ran deficits until post-GFC fiscal consolidation. The COVID-19 crisis led to another round of deep fiscal deficits. But even in the post-COVID period, fiscal deficits have remained significant. After Russia invaded Ukraine in 2022, the enormous defense spending of Ukraine resulted in ~20% fiscal deficit.

This basic analysis of the time series suggests significant macroeconomic volatility. Column (1) of Table 1 reports standard deviations for GDP growth rate and CPI inflation rate for countries in the sample. These figures are much larger (by a factor of two to three) than the corresponding figures for advanced economies,[6] which is consistent with Aguiar and Gopinath

[5] After the GFC, Russia shifted to a more formal inflation targeting with the CBR aiming for an inflation target between 5-6% in 2012, and 4% since 2015 to present. The National Bank of Ukraine transitioned towards formal inflation targeting in 2016 of 5% with a tolerance of ±1%. Both Ukraine and Russia's higher inflation targets, relative to other economically developed countries, shows the needs of price flexibility in these emerging markets due to their varying structural adjustments.

[6] For example, the standard deviation of GDP growth rate in 2000-2024 was 1.8% for the US and 2.3% for Germany. The standard deviation of CPI inflation rate in 2000-2024 was 1.6% for the US and 1.5% for Germany.

(2007) and Mendoza-Fernández and Meyer (2024) documenting (shrinking but still) higher macroeconomic volatility for emerging economies. Naturally, macroeconomic forecasting is difficult in such conditions: Forecast errors are not small, and they increase with the forecast horizon (columns (2)-(5) in Table 1). Furthermore, professional forecasters appear to be systematically optimistic about the ability of the core-sample countries to contain inflation and minimize the size of recessions: Columns (6) and (7) show that, on average, forecast errors are positive for inflation and negative for GDP growth rate. However, the performance of forecasters is better for low-volatility countries (e.g., Poland and Czechia) than for high-volatility countries (e.g., Ukraine and Russia). Given political turmoil and multiple rounds of Russian aggression, Ukraine expectedly stands out in terms of volatility and forecast errors.

To further understand the nature of macroeconomic forecasts, Figure 2 shows string plots comparing projected trajectories and realized data for Ukraine, Russia and Poland (other countries are in Appendix Figure 13). We generally observe strong mean reversion in the forecasts while actual data appears to indicate that shocks can have fairly persistent effects. For instance, professional forecasters consistently underpredicted Russian economic growth in the 2000s and overstated it after the GFC. Ukraine's economic growth consistently underperformed relative to forecasts. We observe similar patterns for inflation but to a lesser extent. These results point to information rigidities where professional forecasters gradually update their macroeconomic "narratives" and thus can fail to capture the persistence of the shocks and shifting trends.

Finally, we note that professional forecasters have different short-term projections across the countries but broad trends in the long-term outlook were largely similar (Figure 3). For example, up until 2014, eastern European countries shared broadly similar projected long-term growth and inflation (with some variation due to differences in inflation targets). This suggests that professional forecasters believed that economic development for these countries was shaped by the same forces such as transition to the market economy, globalization, etc. At the same time, we observe that after 2014, the Russian and Ukrainian economies depart from the pack in terms of long-term outlook growth: Russia was projected to consistently fall behind while Ukraine was predicted to grow much faster than other countries in the region.

V. The Shock and Cost of the War

A long tradition in macroeconomics uses high-frequency analysis to credibly identify and precisely estimate effects of shocks on various outcomes. For example, Swanson (2021) uses changes in the yield curve around U.S. Federal Reserve announcements to identify monetary policy shocks. While macroeconomic forecasts are often not released at frequencies high enough to rule out potentially confounding shocks, the Russian invasion of Ukraine in 2022 is likely as close as one can get to it. First, Consensus Economics currently releases long-term forecasts four times a year (January, April, July, and October) so that we have one long-term forecast in January 2022 (just before the invasion) and one forecast in April 2022 (shortly after the invasion started but with some information on the scale of the shock and the character of the war being available).[7] Second, long-term forecasts in Consensus Economics provide a 10-year-ahead path of macroeconomic variables. As a result, one can compute the difference in the paths across forecast vintages and interpret this difference as an impulse response: The invasion is the impulse, the difference between forecast trajectories measures the response. Third, Consensus Economics collects long-term forecasts for a number of variables which allows us to paint a more complete picture of how the war shock propagates in the economy. Using these unique features, we plot the pre- and post-invasion projections in Figure 4 (consensus forecast for levels of variables) and report the cumulative difference.

Professional forecasters predicted that the war would be highly stagflationary for Ukraine and Russia. Each country was projected to permanently lose a large share of GDP (at least ~ 15% per year below the pre-war projection) and to experience at least 25% cumulative increase in the price level.[8] Because the war was largely expected to be on the Ukrainian territory, the big decrease in output for Russia likely reflects the effects of sanctions and isolation. The decrease in output is broad based in the sense that both private consumption and investment were predicted to contract. Note that private demand was predicted to fall more in Russia than in Ukraine, thus suggesting that professional forecasters anticipated a big, crowding out increase in military spending in Russia and a big aid flow for Ukraine. In terms of external trade balances, Ukraine was projected to run a somewhat larger current account deficit that would reverse after three years. In contrast, Russia

[7] We experimented with using later forecasts in July 2022 and October 2022 to compute the impulse response and found similar results.

[8] Because CPI is a stock variable, the cumulative change is given by the gap in the end of the projected period rather than the area between the pre- and post-shock trajectories.

was projected to have a much larger and rising current account surplus which likely reflected a dramatic increase in energy prices after the invasion.

The rest of Eastern Europe was expected to experience similar, but smaller effects from the invasion.[9] For example, the average cumulative increase in the level of prices was approximately 7% while the average (across countries) cumulative decrease of output was projected at 10.8%. Note that professional forecasters predicted inflation to converge to the inflation target within two years. Both investment and consumption were expected to fall and current account deficits to widen (recall that most countries in Eastern Europe are net importers of energy). Thus, projected spillovers from the war into Eastern Europe were modest but not negligible.

We can quantify the cost of the invasion by creating a forward-looking estimate using GDP growth forecasts from Jan 2022 (pre-invasion) and April 2022 (post invasion), with the main shock between the dates being the Russian invasion.[10] We use the differences in professional forecasts over zero- to five-year-ahead horizons, which correspond to years 2022-2027. The difference in expectations is then multiplied by the corresponding country's GDP in 2021 (measured in constant 2015 USD) from IMF's IFS. This product gives an estimated GDP loss for 2022-2027.[11]

The results (Table 2) reveal a staggering economic loss for countries directly and indirectly affected by the invasion with the combined total cost of war for all 29 countries equating to $2.44 trillion and a loss of 44.95% relative to their GDP in 2021. Ukraine was projected to suffer the most severe relative loss with an estimated 193% loss of GDP (a total cost of $386 billion over six years). Russia has the greatest absolute cost of $1.69 trillion (a loss of 92.4 % of GDP over six years). Countries such as Poland (−$46.6 billion, −6.8%), Romania (−$36.4 billion, −12.7%), and the Czech Republic (−$47.0 billion, −16.2%) experience long term losses stemming from geopolitical spillovers. Within Caucasus and Central Asia, countries like Armenia, Georgia, Moldova, and Kazakhstan were expected to experience a loss between 10-33% attributed to losses in trade. Belarus

[9] GDP is measured in constant 2015 US dollars. Results for each country separately are presented in Appendix Figure 6 and Appendix Figure 7.

[10] The results are similar when we use late vintages of forecasts, see Appendix Table 2 and Appendix Table 3.

[11] Formally, let g_{cmh} represent the forecast for country c, month m, horizon h. The cumulative log growth between year 0 and year H is $l_{c,m.h} = \sum_{h=0}^{H} \log(1 + g_{c,m,h})$ gives. We can then compute the level out output as $\exp(l_{c,m,h})$. The change in the levels from one forecast vintage to another forecast vintage is given by $\Delta level_{c,h} = [\exp(l_{c,April,h}) - \exp(l_{c,January,h})] \times GDP_{c,2021}$. The total cost is $\sum_{h=2022}^{2027} \Delta level_{c,h}$.

was projected to lose $32.1 billion (-47.1%), which is likely attributed to its alliance with Russia and subsequent subjection to Western sanctions. Within the Baltic States, Estonia, Latvia, and Lithuania were expected to lose between 8-20% of GDP, likely due to their prior energy dependence on Russia. It is worth noting that Azerbaijan was forecasted to have an increase of 1.81% of its GDP (994.6 million) showcasing that forecasts expected Azerbaijan to play a role in supplying the EU with alternative energy. Thus, despite Russia and Ukraine bearing a significant portion of the total damages, nearly all the 29 countries were expected to suffer from the war.

With the benefit of hindsight, we can assess how accurate these projections for the cost of the war were. For example, World Bank (2025) estimated that Ukraine's losses in 2022-2024 stood at $524 billion as of December 31, 2024. Various estimates (e.g., Jones and McCabe 2025) suggest that as of June 2025 the war casualties for Russia and Ukraine are close to 1.5 million people. Using $1 million as a conservative estimate for the value of life (Masterman and Viscusi 2018), one arrives at $1.5 trillion cost. These alternative estimates also suggest a different trajectory for the cost. For example, the first (February 2022-June 2022) damage assessment by the World Bank (2022) estimated the cost at $349 billion as of June 1, 2022. This means that between June 2022 and December 2024, Ukraine suffered ~$175 billion in additional damages (roughly equal to Ukraine's GDP in 2021). Therefore, while a large chunk of damages occurred in the early months of the war, the cost of war kept climbing up as the war continued. In other words, the post-invasion projected path of GDP should have been increasing in distance from the pre-invasion path while professional forecasters predicted that Ukraine's GDP will have some catch-up to the pre-invasion path. In a similar spirit, the cost estimates based on losses of life clearly accumulate over time (especially in 2023-2024 when Russia increasingly relied on human wave attacks to gain territory) which would imply *divergence* of pre- and post-invasion trajectories.

To further assess the accuracy of forecasts, we do the same analysis for the Russian aggression in 2014 (Figure 5 and Table 2). Because long-term forecasts are available at lower frequencies for this, we use September 2013 as the baseline, pre-aggression forecast and March 2014 as the forecast after Russian aggression (recall that Ukraine lost control of Crimea on February 27, 2013). However, because the scope of Russian intervention was not fully revealed (Russian presence in the Donbas became apparent in the spring/summer 2014), we also consider the July 2014 forecasts to measure post-shock projections. Figure 5 plots forecast trajectories and actual time series. Even early information incorporated in the March 2014 forecasts suggested that Russian aggression can

be costly for Ukraine (cumulatively 33% decrease in GDP) and Russia (-23%) the rest of Eastern Europe was largely spared (-4%). With more information about the scale of Russian aggression, the projected GDP losses mounted to 71% for Ukraine and 37% for Russia, but there were few changes in the projected losses for Eastern Europe. Hence similar to the 2022 aggression, the 2014 aggression was thought to be contained to Ukraine and Russia. The realized decreases in output were much larger: -156% for Ukraine and -62% for Russia. In terms of absolute amounts, the projected cost increased from $546 billion (constant 2015 dollars) as of March 2014 (column 5 in Table 2) to $753 billion as of July 2014 (column 7 in Table 2) but the latter is still lower than the realized cost of $758 billion (column 9 in Table 2). Although the total for realized series is similar to the total for forecasts as of July 2014, this difference is modest because non-belligerent countries performed better than anticipated. For Ukraine and Russia, the realized costs were roughly double the size ($175 billion and $869 billion respectively) relative to the projections as of July 2014. To be fair, some of these losses were hard to predict (e.g., the collapse of oil prices in the second half of 2014 was not anticipated) but some amplification at least for Ukraine might have been predicted (e.g., the banking and currency crisis was clearly in the making in the final years of the Yanukovych administration). The realization in Ukraine and Russia was much more stagflationary than the projections. These results suggest that the projected losses after the 2022 aggression may be an understatement. In summary, professional forecasters got it qualitatively right that the war would be costly, but their projections understated the losses. The cost of Russian aggression is enormous.

VI. The Fog of War

In this section, we examined if the outbreak of the war created a fog of war among professional forecasters.[12] Specifically, we focus on how disagreement, defined as the standard deviation among professional forecasters, evolved during the war and other crises.

Using the approach from the previous section, we compare pre- and post-invasion disagreement in forecasts. We observe (Figure 6) that the invasion spurred a dramatic increase in forecast disagreement (a proxy for uncertainty) for Ukraine, a smaller increase for Russia, and an even smaller increase for Eastern Europe. This suggests that uncertainty could be a contributing force to output contraction in Ukraine and Russia, but likely less so for Eastern Europe. Strikingly,

[12] The term "fog of war" was dubbed by military strategists to capture the uncertainty faced when conducting operations with limited information.

although professional forecasters strongly disagree in their short-term predictions, the disagreement is much smaller for longer horizons. This pattern is consistent with the view that the war would be highly volatile and unpredictable but relatively short-lived with things going back to normal after roughly a few years.

Figure 7 relates revisions in forecast disagreement to revisions in consensus forecasts. We find that increases in disagreement are negatively correlated with GDP growth rates and positively with CPI inflation rates. That is, uncertainty works as a stagflationary force. This finding contrasts with conventional wisdom and causal evidence for peacetime (e.g., Kumar et al. 2023) that increased uncertainty is like a negative demand shock. Note that these correlations dissipate after two years, again suggesting that forecasters expected a short war.

To gain further insights, Figure 8 plots time series of disagreement in one- and five-year-ahead forecasts for GDP growth rate and inflation rate.[13] Although there is some variation across countries and time, disagreement has similar orders of magnitude for both horizons. Recall that in the early part of the sample we have the GFC when many countries in the region faced not only dramatic short-term uncertainty, but also high uncertainty in their long-run macroeconomic outlook. The latter part of the sample was affected by the COVID-19 crisis which also resulted in large increases in short-term uncertainty as well as increased uncertainty at longer horizons.

Relative to other countries, Russia and Ukraine stand out by having large increases in disagreement in 2014 (Donbas/Crimea) and 2022 (full-scale invasion). Ukraine experienced a fifteen-fold increase (from 0.35% to 15.1%) in short-term (one-year-ahead forecast) disagreement, immediately after the invasion reaching its historical maximum. Despite short-term disagreement showing extremely volatile behavior, long-term disagreement for Ukraine increased, but at a modest rate, thus suggesting that professional forecasters were more confident that Ukraine's economy would eventually recover. Russia also experienced a similar disparity, however, the magnitude for short-term disagreement increase (0.48% to 2.0%) was smaller than Ukraine's. This smaller initial containment indicates that despite facing Western sanctions, since Russia did not experience the extent of capital destruction that Ukraine faced, forecasters were more aligned on its potential for recovery and Russian economic collapse was predicted to be cushioned from its greater fiscal buffers. Other Eastern European countries had heterogeneous responses which initially appear to be associated with geographical ties from the war. Poland, one of Ukraine's

[13] Appendix Figure 12 compares forecast disagreement for Ukraine, Russia, and Eastern Europe (average).

bordering countries, showed increasing levels of short-term disagreement but to a lesser magnitude than the two primary warring countries. The Baltic states (especially Estonia which borders with Russia) shared increases in immediate disagreement post war.

The extreme spikes in short-term disagreement indicate that the economic shock from the war differs from traditional business cycles. Unlike the traditional demand and supply side forces that come with recessions, the Russian invasion created a fundamental sense of uncertainty comparable to a deadly pandemic or major economic catastrophes like the GFC.

VII. Spillovers and Decoupling

In this section, we study how Russian aggression against Ukraine affects other countries in the region. To this end, we do several exercises. First, we examine how economic developments in Ukraine and Russia deviate from the trends observed for other countries in the region. Second, we use previous crises to benchmark the size of spillovers from the war. Finally, we investigate how the strength of spillovers correlates with distance from the war.

A. Decoupling

As we discussed earlier, Eastern European economies exhibited strong comovement with Ukraine and Russia being occasional outliers. To formalize this point, we plot the projected growth rate of GDP for Eastern European economies vis-à-vis growth rate for Ukraine (Figure 9) and Russia (Figure 10) as well as the 45° line. We distinguish three periods: pre-2014 ("normal"), first round of Russian aggression (Crimea-Donbas, 2014-2021), and the second round of Russian aggression (full-scale invasion, 2022-2025). If the growth rates are roughly on the 45° line, then countries show strong comovement. Points above (below) the 45° line indicate that the country with the growth rate indicated on the horizonal axis is predicted to underperform (outperform) relative to the country whose growth rate is reported on the vertical axis.

We observe that, in normal times, Ukraine was a serial underperformer: It was systematically predicted to grow much faster than other countries in the region—which is consistent with expected convergence of Ukraine to peer countries (recall that Ukraine has one of the lowest GDP per capita in the region)—but it failed to deliver. In contrast, Russia was a "normal country" in normal times, i.e., observations are close to the 45° line. After both rounds of Russian aggression, Ukraine was expected to grow faster than peer countries. This is especially so after the full-scale invasion when Ukraine's growth considerably departs from the 45° line. On the other

hand, Russia is projected to fall behind peer countries, especially so after the full-scale invasion. Specifically, the long-run growth of the Russian economy is projected to be roughly 1.5 percentage points below the Eastern European average, a dramatic slowdown.

These results suggest that macroeconomic dynamics for Ukraine and Russia are expected to effectively decouple from macroeconomic trends in the rest of Eastern Europe. This decoupling likely captures many factors: post-war reconstruction boom in Ukraine, decreased attractiveness of Russia as a destination for investment, adverse demographic trends in Russia, collapse of trade and financial flows between Eastern Europe and Ukraine (due to the collapse of the economy) and Russia (due to sanctions), and active policies of non-belligerent countries to minimize exposure to the belligerent countries.

B. Spillovers

Despite the decoupling, the war is still felt by Eastern European economies. To quantify the impact, we estimate the following regression country by country:

$$F_{ct}X_{c,t+h} = b_{0c} + b_{c1} \times \mathbb{I}(t \in GFC) + b_{c2} \times \mathbb{I}(t \in COVID19) + b_{c3} \times \mathbb{I}(t \in Crimea\&Donbas) + b_{c4} \times \mathbb{I}(t \in Full\ Invasion) + error_t \quad (1)$$

where $F_{ct}X_{c,t+h}$ is time-t consensus h-period-ahead forecast for variable X in country c, $\mathbb{I}(t \in Event)$ is an indicator variable equal to one if time t is during $Event$. One may expect that global shocks such as the Global Financial Crisis (GFC) or COVID-19 should affect all countries (although to a potentially different degree depending on a country's exposure). These events give us a benchmark for comparison when we study the spillovers due to various rounds of Russian aggression. To preserve space, we report results only one- and five-year ahead forecasts for inflation and GDP growth rate (consensus in Table 3 and disagreement in Table 4) for select countries (Ukraine, Russia, Poland as well as the pooled sample for Eastern Europe).

Consistent with our earlier discussion, the 2014 aggression was contractionary for both Russia and Ukraine, but inflationary pressures were mixed: higher inflation for Ukraine and lower inflation for Russia. For the rest of the region, professional forecasters projected a growth slowdown and some disinflation at short- and long-term horizons. *A priori*, one may have expected this shock to have smaller macroeconomic implications than the GFC or COVID-19 crises, but the estimated responses have similar orders of magnitude. This finding suggests that although the world largely

shrugged at Russian imperialism in 2014, professional forecasters anticipated this aggression to have material effects on the economy in the region. The full-scale invasion was projected to have larger effects on economic growth not only for Russia and Ukraine but also for other countries (e.g., $\hat{b}_4$ for Poland is at least double for $\hat{b}_3$). At least in part this can be explained by a large increase in uncertainty (Table 4). Also notice that the full-scale invasion is clearly inflationary for all countries in the core sample due to not only war risks but also higher energy prices.

To further refine our analysis, we use the daily war intensity index from the Violent Incident Information from News Articles (VIINA) constructed by Zhukov (2023) and aggregated to the monthly frequency to match the frequency of Consensus Economics releases. We normalize the index to take the value of 100 in February 2022, the month with the highest intensity of the war, and estimate the following specification on the 2016-2025 period:

$$F_{ct}X_{c,t+12m} = \beta_{0c} + \beta_{c1} \times \mathbb{I}(t \in COVID19) + \beta_{c2} \times VIINA_t + error \qquad (2)$$

where $F_{ct}X_{c,t+12m}$ is the 12-month-ahead forecast for variable X, the coefficient of interest β_{c2} measures how the war intensity affects consensus predictions and forecast disagreement for each country c. In other words, while b_{c4} in specification (1) measures the average effect of the war, β_{c2} in specification (2) measures the effect of the war in a given month.

We find (Table 5) that higher war intensity reduces projections for output and increased expected inflation not only dramatically for Ukraine and Russia, but also for a broad spectrum of Eastern European countries. Furthermore, more intensive war is associated with higher uncertainty for inflation and output outlook. Panel C of Table 5 also shows that more intensity is associated with larger budget deficits potentially due to larger defense outlays, shrinking economy, refugee flows, higher energy costs, etc. Because according to VIINA the intensity of the war has been declining, the average spillovers from the war likely understate the strength of the spillovers.[14]

Finally, we relate the cost of war and the distance to potential danger. Because there are many ways to define the location of hostilities as well as domestic centers of political or economic activity, we compute the distance between a given country's capital and three possible war sites: Moscow, Kyiv, and Donetsk. Figure 11 presents three versions of the relationship. We find that professional forecasters prescribe a greater cost of war to countries that are closer to the war. This association is robust to using the three options, although for some countries (e.g., the Baltics)

[14] We find similar results when we control for the natural gas prices in Europe, see Appendix Table 4.

distance to Moscow is more important than distance to Kyiv or Donetsk. The estimated slope coefficients suggest that reducing distance to the war by 150 kilometers increases the expected cost of war by approximately two percentage points. These findings corroborate earlier analyses (e.g., Abadie and Gardeazabal 2003, Federle et al. 2022, 2024) documenting that proximity to a conflict is costly. In a similar spirit, the figure also shows that defense spending decreasing in distance, which gives a positive correlation between the cost of war and defense spending.

VIII. Is War a Demand or Supply Shock?

Economists have long been interested in how one can manage a wartime economy. For example, Keynes (1940) discussed the importance of using fiscal policy to discourage private consumption to prevent the British economy from overheating in World War II. In a similar spirit, macroeconomists have used defense spending shocks to study how changes in demand affect inflation, output, and other aggregate outcomes (e.g., Ramey and Shapiro 1998, Auerbach and Gorodnichenko 2016) as well as distributional aspects of defense spending (e.g., Auerbach, Gorodnichenko, and Murphy 2022). However, wars are not characterized only by demand-side shocks. Indeed, World Bank (2025) and others document that Russian strikes adversely affected the productive capacity of the Ukrainian economy. The National Bank of Ukraine estimated that in the first months of the full-scale invasion, Ukraine's potential output fell by 26% (Appendix Figure 9). Hence, wars are a mixture of supply and demand disturbances, and it is important to know the net of the mix.

While one can use vector autoregressions and other statistical tools to provide a variance decomposition for output and other variables, these conventional approaches rely on stable relationships which can obviously fail during a war. Because professional forecasters use news as well as information in the lags of macroeconomic variables, one may expect that their projections be less vulnerable to structural shifts in the data.

In particular, Candia et al. (2020) offer a simple test to determine the net of the supply-demand mix: If demand (supply) shocks are the dominant force behind macroeconomic fluctuations, one should expect a positive (negative) cross-sectional correlation in forecasts for inflation and output. To implement this idea, we estimate the following regression using cross-sections of one-year-ahead forecasts:

$$F_{ict}\pi_{c,t+1} = \beta_c \times F_{ict}\Delta Y_{c,t+1} + \lambda_t + \eta_i + error \quad (3)$$

where i,c,t index forecasters, countries, and time, π and ΔY denote inflation and output growth rate, and λ_t and η_i are time and forecaster fixed effects. The parameter of interest is β_c which measures the sign and intensity of the correlation between output and inflation for country c.

We find (Figure 12) that the correlation is generally negative for Ukraine, which contrasts with the positive correlation for advanced economies (Candia et al. 2020). However, the estimated β for Eastern European countries is generally negative (but close to zero) in the early part of the sample period which underscores the importance of supply-side forces associated with the transition from command to market economy, a key feature for the countries in our sample. On the other hand, Russia had massive reversals in the sign and magnitude of $\hat{\beta}$ in the 2000s. This likely reflects the commodity price cycle and the dramatic rise in oil prices which fueled an economic boom in the country. Consistent with the conjecture, we see that the sign of the correlation turned negative in 2014 not only due to sanctions for the illegal annexation of Crimea and occupation of the Donbas region, but also due to a 50% collapse in oil prices.

We observe that $\hat{\beta}$ for Ukraine turned deeply negative in 2014-2019. This is consistent with the fact that, between 2013Q4 and 2015Q2, potential output declined by 17% due to the loss of Ukraine's control of Crimea and the Donbas, disruption of supply chains, loss of human lives, etc. stemming from Russian aggression (Appendix Figure 9). The lingering war risks significantly increased the cost of doing business in Ukraine and thus protracted the importance of supply-side factors. The negative sign of $\hat{\beta}$ suggests that these factors dominated large demand shocks that happened in this period too (e.g., the 2014-2015 crisis in the banking system). As the Russian and Ukrainian economies adjusted to the new reality, $\hat{\beta}$ gradually rose but remained negative.

The full-scale invasion in 2022 pushed $\hat{\beta}$ more into negative territory not only for Ukraine and Russia but also for other countries in Eastern Europe. Again, this is consistent with supply-side factors being more important than demand-side factors. For instance, the spike in energy prices experienced in Eastern Europe is a classic example of supply-side shocks. However, as the war continued, $\hat{\beta}$ flipped the sign. One potential explanation for these dynamics could be that as Russia and Ukraine absorbed the first shocks of the war, the fiscal stimulus from massive military spending outweighed shocks affecting supply. Furthermore, central banks in both countries have been increasingly using contractionary monetary policy to reduce inflationary pressures.

To be clear, this does not mean that supply-side factors are not important. They are very large: Russia relentlessly attacks Ukraine's energy infrastructure and the National Bank of Ukraine

projects up to 5% deficits (and hence blackouts) of electricity, which can rationalize a downward turn in $\hat{\beta}$ in the end of our sample period. However, the demand shocks are so large that they dominate supply shocks.

In short, macroeconomic stabilization is difficult in the face of supply-side shocks and especially so in response to the destruction and loss of life not seen in Europe since World War II. However, professional forecasters appear to believe that the war of attrition with the emphasis on committing enormous economic resources increasingly looks like a (net) demand shock. The positive co-movement in inflation and output forecasts thus calls for more activist macroeconomic management along the lines suggested by Keynes (1940).

IX. Hysteresis

While wars can undoubtedly leave deep scars, it remains to be seen how Russian aggression can affect long-term performance of Ukraine, Russia, and other countries in the region. Despite this uncertainty, macroeconomic projections can provide a glimpse of the future. Specifically, long-term forecasts can inform us about whether the war leads to hysteresis effects or not.

In particular, we can regress long-term forecasts on short-term forecasts to quantify the pass-through from current economic fluctuations to longer-run outcomes:

$$F_{ct}\Delta Y_{t+5} = \beta_c \times F_{ct}\Delta Y_{t+1} + error \quad (4)$$

where c, t index countries and times, ΔY_{t+5} is the annual growth rate of GDP in five years, ΔY_{t+1} is the annual growth rate of GDP over the next 12 months. If economic shocks are transitory, one should find $\beta \approx 0$. If short-term fluctuations have a strong hysteresis effect so that output growth rate becomes a random walk, one should find $\beta \approx 1$. We estimate specification (4) for consensus forecasts and forecast disagreement and report results for Ukraine, Russia, and Eastern Europe.

To be clear, this correlation can capture a variety of forces such as hysteresis effects from business cycles (see Cerra, Fatás, and Saxena 2023 for a survey) and long-term trends in economic growth as transition economies converge toward their more advanced counterparts in Europe. Therefore, it is instructive to estimate β for four periods: GFC (2008M1-2009M12), COVID-19 crisis (2020M3-2020M12), the full-scale invasion period (2022M2-2025), and garden-variety business cycles (the rest of the sample). The latter period provides a point of reference. The GFC and COVID-19 crisis represent exogenous (for the countries in our sample) shocks and therefore give us a benchmark for what to expect during economic catastrophes.

We observe (Table 6, Figure 13) that generally, there is a positive correlation between short- and long-term growth forecasts, with the estimated pass-through β for normal times being 0.21 for Ukraine, 0.22 for Eastern Europe, and 0.37 for Russia. The Russian case could reflect the nature of the Russian economy: The growth rate of Russian GDP is strongly correlated with the price of oil (e.g., Gorodnichenko, Korhonen and Ribakova 2024, SITE 2024) and since oil price is close to a random walk, one can have a stronger correlation between short- and long-term forecasts. Interestingly, the pass-through for forecast disagreement (columns 4-6 in Table 6) is very high for Russia (likely due to large volatility of oil prices) and low for Ukraine.

We now turn to βs that characterize the relationships during two economic crises. In the case of COVID-19, the estimated slope is closer to zero. Hence, professional forecasters predicted that a sharp contraction in output during the early stages of the pandemic would be eventually reversed and the economies would return to their pre-pandemic trajectories (i.e., minimal hysteresis effects). The GFC has a somewhat larger slope but the estimated β remains small: approximately 0.10 for Ukraine (likely due to a large banking crisis in the country, and a large increase in the pass-through for disagreement), and 0.04 for Russia and Eastern Europe. Again, these results suggest that the scarring effect was not negligible, but it was relatively small.

Hysteresis effects during the full-scale invasion in 2022 appear to be similar to those during the COIVD-19 and GFC crises. That is, professional forecasters did not expect short-term variation in the growth rate of output to translate into long-term variation. This pattern is consistent with the view that the war would be relatively short, and the economies would return to business as usual.[15] One may also interpret these results as suggesting that the phase of destruction will be followed by rapid "catch-up" growth (as predicted by e.g., the Solow growth model). This logic may apply to post-war Ukraine if reconstruction is supported by significant investments funded by the EU, foreign direct investment, or other donors. However, these interpretations appear to us too optimistic, because the "catch-up" phase is likely to last more than five years after such a large war. Furthermore, investors who lost their business under Putin may be reluctant to enter Russia again and hence normalization in Russia may be more sluggish.[16]

[15] The scarring effects of the war may be also reduced by increased defense spending in response to Russian aggression (Ilzetzki 2025).

[16] Tomz and Wright (2013) report that about half of all sovereign defaults led to exclusion from capital markets for a period of more than 12 years. Russia was forced to default in 2022. Furthermore, the negative estimate of β for Russia suggests that the more growth Russia has now, the less growth it will have in the long run. One interpretation of this

X. Information rigidities

Few people enjoy macroeconomic volatility or catastrophes, but these offer a source of variation to test various theories and decisively establish whether a hypothesis is borne out in the data or not. This observation is particularly relevant in the context of testing theories of how economic agents acquire and process information, because such processes are clearly endogenous and we often do not know what is known to economic agents in real time (i.e., it is very difficult to construct an information shock). To the extent the exact timing of Russian aggression was not known in real time (e.g., many politicians and commentators in Ukraine and elsewhere refused to believe that Russia would invade Ukraine)[17], we have an opportunity to explore the nature and degree of information rigidities for professional forecasters.

A. Information rigidity

Building on Coibion and Gorodnichenko (2015), Goldstein (2023) offers an attractive framework to estimate the degree of information rigidities at high frequencies by using cross-sectional variation in macroeconomic forecasts. The econometric specification is given by:

$$F_{ict}x_{c,t+12} - \overline{F_{ct}x_{c,t+12}} = \beta_t \times \left(F_{ic,t-1}x_{c,t+10} - \overline{F_{c,t-1}x_{c,t+10}}\right) + error \qquad (5)$$

where i, c, t index individual forecasters, countries, and time (in month), $F_{ict}x_{c,t+12}$ denotes a forecast for variable x made by forecaster i in country c for time $t+12$, and $\overline{F_{ct}x_{c,t+12}}$ is the consensus (average) forecast. The dependent variation is the deviation of forecaster i from the consensus forecast at time t, while the regressor is the deviation of the same forecaster from consensus at time $t-1$. Note that the Goldstein (2023) approach requires that the forecast should be for the same event. We depart from this specification by using 12-month-ahead forecast to ensure that we fully utilize the data (e.g., we can use data as survey waves move from one calendar year to another). To maximize precision of the estimates, we pool data across macroeconomic variables (normalized by the time-series standard deviation).

As discussed in Goldstein (2023), specification (5) is estimated period by period and coefficient β_t measure the degree of information rigidity. For example, in the context of the noisy information model, $\beta_t = 1 - G_t$ where G_t is the Kalman gain. A higher value of G_t means that

finding is that wartime economic growth in Russia is driven by military spending and the more Russia spends on the war, the deeper grave it digs for itself by exhausting manpower, exacerbating misallocation of resources, etc.

[17] In 2016, Donald Trump said, "He's not going into Ukraine, OK, just so you understand. He's not going to go into Ukraine, all right? You can mark it down. You can put it down. You can take it anywhere you want."

forecasters put more weight on incoming information and this greater sensitivity to new information indicates a lower degree of information rigidity. Hence, a high value of β_t indicates high information rigidity.

To summarize broad trends in the data, Figure 14 plots smoothed time series of β_t for Ukraine, Russia, and Eastern European averages. Consistent with Goldstein (2023), we find that information frictions for the countries in the region were lower during the GFC of 2008-2009. The sovereign debt crisis also lowered information rigidities for Eastern European countries but not for Ukraine or Russia. The illegal annexation of Crimea and partial occupation of the Donbas in 2014 are the times when information rigidities declined for Ukraine and Russia but were not much affected for other countries in the region. This pattern suggests that professional forecasters perceived that the conflict is contained within Russia and Ukraine. At the time, we note that more attention to Russia may stem from the dramatic fall in oil prices in 2014 rather than Russian aggression or sanctions per se. The COVID-19 crisis again generated comovement in attention (information rigidities fell) for Ukraine, Russia, and Eastern European countries. The smoothed time series suggests that the full-scale invasion did not affect the level of attention and if anything, information rigidities appear to increase after 2022. While the latter may capture the war of attrition where there is little new information about the course of the war (i.e., "normalization" of the war), the former is surprising because the invasion was a major shock.

Figure 15 shows that this surprising result is an artifact of smoothing the estimates. Specifically, when we use month-by-month estimates, we observe that in the first post-invasion survey wave $\hat{\beta}_t$ fell essentially to zero for Ukraine, thus suggesting that information rigidities were very small. Furthermore, we observe that some low values of $\hat{\beta}_t$ during the war may be attributed to major developments such as Ukrainian forces liberating Kherson from Russian occupation, a major development that raised expectation for a successful counteroffensive of Ukraine in 2023. In a similar sprit, we observe large decreases in $\hat{\beta}_t$ for Russia and for selected Eastern European countries such as Poland that have greater exposure to the war and more generally potential Russian aggression in the future.

In summary, professional forecasters are attuned to the progress of the war and revise their projections in light of major developments. Consistent with earlier studies (Coibion and Gorodnichenko 2015, Goldstein 2023), we thus find that attention is likely state-dependent. While

prior work generally focused on state-dependence due to economic crises, our findings suggest that state-dependence applies more broadly and likely includes conflicts, wars, geopolitical tensions, etc.

B. Disagreement

While the Goldstein (2023) and similar tests cover a broad range of information-rigidity models, they do not generally distinguish the nature of information frictions (e.g., noisy information vs. sticky information). Coibion and Gorodnichenko (2012) show that one can use disagreement across forecasters to shed more light on the nature of the friction. For example, canonical noisy-information models predict that disagreement should not change after shocks. Intuitively, forecasters disagree because they receive private signals about the state of the economy and to the extent the dispersion of private signals is stable (which is the case in the canonical model), disagreement should not change. In contrast, the canonical sticky-information model generally predicts that disagreement should increase after a shock because forecasters use different information sets (intuitively, some forecasters are unaware of the shock and so they have different forecasts). In short, the response of disagreement to a shock can inform us about the nature of information frictions or the necessary extensions for canonical models.

As discussed earlier, Russian aggression in 2014 and 2022 dramatically increased disagreement in forecasts. However, we can refine this result further by examining the dynamics of forecast revisions by controlling changes in the composition of forecasters in the sample. Figure 16 documents that the size of revisions in 2014-2015 and 2022 were comparable to the size of revisions during the GFC or the COVID-19 crisis. However, the standard deviation of forecast revisions increased more after each round of Russian aggression than after GFC or COVID-19. We conjecture that this larger increase is consistent with *i*) professional forecasters having limited experience with forecasting during war times and *ii*) a fog of war where signals are confusing, incomplete, or weak.

Note that consistent with our earlier results, the increase in disagreement is much more pronounced for Russia and Ukraine, a sign that the war was "compartmentalized" to Russia and Ukraine. Also notice that it takes more than a year for disagreement to subside. Thus, while information rigidities declined precipitously after Russian aggression, convergence of information sets has been gradual.

Although this evidence points towards sticky information, one can enrich the canonical model of noisy information to have more flexibility at matching the data. For instance, one can

assume that the volatility of private signals is state-dependent and thus generate an increase in disagreement for the noisy-information model too. At the same time, introducing state-dependence can reduce the reaction of disagreement in the sticky-information model as agents update their information sets more frequently after large shocks. Indeed, it appears unlikely that forecasters do not increase the frequency of information updates after major shocks (and our results in the previous section suggest that this is the case). One can entertain other explanations too. For instance, the process of gradual convergence may also indicate that forecasters use different models to interpret the data (i.e., forecasters have access to the same information but they end up with different forecasts because they have different models) or have different signals about the future course of the war (i.e., forecaster have access to the same realized macroeconomic data but they can have different signals about future developments). While we cannot formally test the former, in the next subsection we investigate the importance of the latter.

C. Forward information

An enduring insight of Sims (1980) is that lags of macroeconomic variables contain a lot of information helpful for predicting the future course of these variables. However, the information value in the lags depreciates quickly in a new, rapidly shifting environments such as wars. In such settings, professional forecasters must heavily rely on "forward" information (news, anecdotes, and even rumors) to sharpen their projections. Although it is generally difficult to measure such "soft" signals, Goldstein and Gorodnichenko (2022) offer a simple framework to quantify forward information.

Intuitively, in the absence of shocks, macroeconomic forecasts should evolve by iterating the forecasts forward dynamically. For instance, the $t+h$ forecast of variable x_t that is an AR(1) process with persistence ρ is given by $x_{t+h|t} = \rho x_{t+h-1|t}$. Note that ρ as perceived by forecasters may deviate from the true ρ and therefore using actual series to estimate ρ is not generally appropriate. However, if one uses large enough h, one can estimate a forecaster's ρ (which we denote with $\hat{\rho}$) by regressing $t+h$ forecast on $t+h-1$ forecast because forecasters are unlikely to have precise forward information at very long horizons. Importantly, the residual $x_{t+h|t} - \hat{\rho} x_{t+h-1|t}$ can be interpreted as the part of macroeconomic projection that is not rationalized by the lags and hence it measures the "input" from a professional forecaster. This residual is thus a measure of judgement calls, ad factoring, and other forms of forward information. Note that in a stable environment one can demean the error term, but in our case, we subtract 10-year-ahead

forecast from $x_{t+h|t}$ and from $x_{t+h-1|t}$ to effectively detrend the data. This is a flexible way to control for low-frequency variation in the series (e.g., gradual disinflation in transition economies, a slowdown in economic growth after the GFC).

Using long-term forecasts collected by Consensus Economics, we regress six-year mean (consensus) forecast on five-year ahead mean forecast to estimate ρ and then use this estimate to compute forward information (FI) contained in one-year-ahead forecast ($FI_{t+1|t} = x_{t+1|t} - \hat{\rho}x_{t|t}$), two-year-ahead forecast ($FI_{t+2|t} = x_{t+2|t} - \hat{\rho}x_{t+1|t}$), three-year-ahead forecast ($FI_{t+3|t} = x_{t+3|t} - \hat{\rho}x_{t+2|t}$), and four-year-ahead forecast ($FI_{t+4|t} = x_{t+4|t} - \hat{\rho}x_{t+3|t}$). We report results for Ukraine, Russia, and Poland in Figure 17.

We find significant variation in FI both for GDP and inflation forecasts. Although one can use cross-sections of projections across forecasters to compute the share of variation in forecasts at a given horizon that is due to forward information (see Goldstein and Gorodnichenko 2022 for details), Consensus Economics does not report long-term projections for individual forecasters. However, an "eyeball" comparison of time series for forecasts and FI suggests that these two series exhibit much comovement. This pattern suggests that forward information accounts for much variation in forecasts over time. Interestingly, the importance of FI does not decline much with the forecast horizon. Although this finding contrasts with the US/euro-area results in Goldstein and Gorodnichenko (2022), one may expect that radical structural shifts in post-communist economies should make lags less reliable predictors and hence the role of forward information may be large even at relatively long horizons.

This result agrees with popular narratives. For instance, in mid-2022, professional forecaster predicted rapid economic growth for Ukraine in 2023. While some reversal after a negative shock can be expected, our results indicate that forecasters factored in a more rapid recovery given then-current intensive discussions of the reconstruction plan for Ukraine. Forward information and forecasts can move in opposite directions too. For example, when Russia was sanctioned shortly after the invasion started, professional forecasters predicted a spike in 2023 inflation for Russia, but forward information was negative. This is consistent with the massive increase in revenue from Russian energy exports which forecasters projected to strengthen the ruble and thus slow down inflation faster than one would normally expect after a surge. Interestingly, inflation forecasts for Poland largely coincide with forward information because inflation in Poland has low serial

correlation (which is consistent with successful inflation targeting) and therefore persistence in inflation forecasts has to be driven by forward information (i.e., the "residual").

D. Recap

We have examined various aspects of expectations formation for professional forecasters and our results point to several broad conclusions. First, the military conflict resulted in rapid revisions in expectations and more generally low information rigidities. Second, similar to economic catastrophes, the war created profound disagreement in macroeconomic outlook. Third, we observe that forecasters reverted to having relatively high information rigidity and similar outlooks as the narratives (e.g., what a war of attrition entails for the economy) behind forecasts converged. Finally, Ukrainian/Russia/Eastern European forecasters rely on forward information much more than forecasters in advanced economies.

XI. Concluding remarks

Russian imperialism, with its aggression, malice, and barbarism, is a profound challenge for global order, world peace, and prosperity of humankind. Yet, there are few estimates of how costly Russian belligerence is. Obviously, the full extent of the toll will be revealed only after Russian aggression is defeated, but there is an acute need to have at least tentative estimates to inform policy, minimize damages, and lay groundwork for recovery. To this end, we use a database of macroeconomic forecasts to quantify the predicted effect of the war on output, inflation, and other aggregates for Ukraine and Russia as well as countries in Eastern Europe, Caucasus, and Central Asia.

Professional forecasters suggested a staggering cost ($2.4 trillion) of Russia's full-scale invasion of Ukraine not only for belligerent countries but also for their neighbors in the region, but we argue that this cost estimate is likely an understatement. Professional forecasters predicted the war to weigh heavily on the region, far beyond the immediate war zone but with the strongest effects on countries close to the war. In addition to these spillovers, the war was expected to have a persistent negative ("hysteresis") effect on the regional economies. We document that the initial phase of the war was a net supply-side shock thus making macroeconomic stabilization difficult, but the later phase (war of attrition) is a net demand-side shock. Utilizing this enormous shock, we also document that information rigidities are pervasive even during the war, but, of course professional forecasters can and do respond quickly to large shocks, which points to state-dependent acquisition and processing of information.

While economics is sometimes described as a dismal science and the subject of our analysis is certainly not a happy one, there is a ray of hope in what professional forecasters predicted—and continue to predict—for Ukraine. Indeed, unlike Russia, Ukraine is expected to have a strong recovery phase after the war is over. To some extent, this prediction is already being borne out in the data: Ukraine's economy cumulatively grew by more than 25 percent after reaching a trough in early 2022. Of course, this is not enough to offset the enormous damages inflicted by the Russian onslaught, but Ukraine's resilience is certainly consistent with professional forecasters' optimism about the country's ability to spring back.

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Table 1. Macroeconomic volatility and forecast errors.

	St.Dev. actual data, %	$\frac{std(forecast\ error)}{std(actual\ data)}$		$\frac{mean(abs.\ forecast\ error)}{std(actual\ data)}$		$\frac{mean(forecast\ error)}{std(actual\ data)}$	
		Current year	Next year	Current year	Next year	Current year	Next year
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A. CPU inflation							
Ukraine	10.7	0.85	0.87	0.54	0.73	0.19	0.73
Russia	5.2	0.45	0.96	0.34	0.67	0.22	0.67
Bulgaria	4.5	0.75	0.73	0.45	0.61	0.08	0.61
Romania	7.9	0.26	0.35	0.16	0.32	0.01	0.32
Poland	3.6	0.56	0.72	0.37	0.60	0.02	0.60
Czechia	3.3	0.60	0.87	0.30	0.60	0.09	0.60
Slovakia	3.7	0.54	0.65	0.33	0.60	0.06	0.60
Slovenia	2.6	0.72	0.80	0.46	0.64	0.04	0.64
Hungary	4.1	0.52	0.81	0.30	0.62	0.13	0.62
Croatia	3.1	0.73	0.78	0.47	0.65	0.05	0.65
Estonia	5.0	0.75	0.85	0.48	0.63	0.17	0.63
Latvia	5.3	0.64	0.70	0.37	0.55	0.16	0.55
Lithuania	5.1	0.74	0.82	0.42	0.58	0.20	0.58
Panel B. GDP growth rate							
Ukraine	8.8	0.90	0.87	0.54	0.66	-0.19	0.66
Russia	4.1	1.00	0.82	0.69	0.72	0.25	0.72
Bulgaria	2.9	0.89	0.90	0.60	0.78	-0.14	0.78
Romania	4.0	0.77	0.63	0.60	0.70	0.12	0.70
Poland	2.2	0.80	0.61	0.60	0.88	0.09	0.88
Czechia	2.9	0.79	0.81	0.53	0.77	-0.03	0.77
Slovakia	3.5	0.79	0.71	0.56	0.68	-0.08	0.68
Slovenia	3.9	0.86	0.79	0.58	0.82	-0.15	0.82
Hungary	3.2	0.71	0.78	0.49	0.67	-0.03	0.67
Croatia	5.0	0.84	0.79	0.56	0.74	-0.12	0.74
Estonia	5.5	0.82	0.92	0.60	0.66	-0.19	0.66
Latvia	5.5	0.75	0.98	0.54	0.64	-0.24	0.64
Lithuania	4.9	0.76	1.03	0.49	0.62	-0.02	0.62

Notes: column (1) shows the standard deviation of actual series for the period with available Consensus Economics forecasts. Columns (2) and (3) show the standard deviation of forecast errors normalized by the standard deviation of actual series (column (1)). Columns (4) and (5) show the mean absolute forecast error normalized by the standard deviation of actual series. Columns (6) and (7) show the average forecast error normalized by the standard deviation of actual series (column (1)).

Table 2. Cost of Russian aggression.

	GDP, 2021, US$ billion	Full-scale invasion, 2022		Crimea/Donbas, 2014					
		April '22 vs January '22		March '14 vs September '13		July '14 vs September '13		Actual vs September '13	
		GDP cost, % of 2021 GDP	GDP cost, US$ billion	GDP Cost, % of 2013 GDP	GDP cost, US$ billion	GDP Cost, % of 2013 GDP	GDP cost, US$ billion	GDP Cost, % of 2013 GDP	GDP cost, US$ billion
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Albania	18.1	5.0	0.9						
Armenia	13.9	10.2	1.4						
Azerbaijan	54.8	-1.8	-1.0						
Bulgaria	84.5	11.6	9.8	11.1	5.4	8.2	4.0	8.3	4.0
Bosnia	23.7	3.1	0.7						
Belarus	68.2	47.1	32.1						
Cyprus	30.4	8.2	2.5						
Czechia	291.0	16.1	46.9	0.1	0.2	-6.8	-12.0	-24.7	-43.5
Estonia	37.2	10.3	3.8	11.0	2.4	28.9	6.4	11.7	2.6
Georgia	18.9	11.3	2.1						
Croatia	69.1	8.9	6.1	11.1	5.6	18.6	9.3	-1.9	-1.0
Hungary	183.3	6.0	11.0	2.0	2.3	-5.4	-6.3	-38.9	-45.0
Kazakhstan	197.1	13.8	27.2						
Lithuania	67.1	8.4	5.6	7.9	3.1	10.2	4.0	16.3	6.3
Latvia	38.2	20.0	7.6	3.5	0.9	9.3	2.3	31.0	7.7
Moldova	13.7	32.7	4.5						
Macedonia	14.0	7.5	1.1						
Montenegro	5.9	5.0	0.3						
Poland	689.3	6.8	46.9	-0.2	-0.9	-1.8	-8.0	-21.6	-95.5
Romania	286.8	12.7	36.4	-3.9	-6.5	-4.9	-8.1	-31.6	-52.3
Russia	1,829.0	92.3	1688.2	23.1	319.0	37.5	517.9	62.9	868.6
Serbia	65.8	4.7	3.1						
Slovakia	120.7	12.9	15.6	-0.3	-0.2	-0.9	-0.7	-5.2	-4.3
Slovenia	61.6	4.7	2.9	4.1	1.7	-2.5	-1.0	-48.2	-19.6
Turkmenistan	60.9	2.6	1.6						
Turkey	807.9	10.9	88.1	22.6	175.5	21.4	166.1	-5.8	-45.0
Ukraine	199.8	193.0	385.6	33.4	37.5	70.6	79.2	156.2	175.3
Uzbekistan	77.3	13.1	10.1	11.1	5.4				
Kosovo	9.4	11.8	1.1						
Total	5,437.53	44.9	2442.3	15.7	545.9	21.7	753.2	21.8	758.3

Notes: the table reports estimates of the cost of Russian aggression in 2014 (the illegal annexation of Crimea and partial occupation of the Donbas) and 2022 (full-scale invasion). The cost is measured in percent of GDP (columns 2, 4, 6, 8) before the corresponding round of aggression and in absolute terms (billions; constant, 2015 dollars; columns 3, 5, 7, 9). The GDP of the economies in 2021 (billions of current dollars) is reported in column (1). For columns (5), (7) and (9) the cost is reported in 2015 constant dollars. The last row reports totals for the region. The % change for the total is the average of country-specific percentages weighted by their GDP in 2021 (for column 2) and 2013 (for column 4, 6, 8). Consensus Economics data are not available for empty cells.

Table 3. Consensus forecast spillovers.

	1-year-ahead consensus forecast				5-year-ahead consensus forecast			
	Ukraine	Russia	Poland	Eastern Europe	Ukraine	Russia	Poland	Eastern Europe
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: GDP								
Global Financial Crisis	-0.54	1.46	-0.44	-1.02**	1.08***	2.35***	0.99***	1.22***
	(1.36)	(1.13)	(0.80)	(0.48)	(0.31)	(0.38)	(0.22)	(0.09)
COVID19 crisis	-0.15	-0.07	0.47***	1.40***	-1.10***	-1.70***	-1.04***	-0.70***
	(0.25)	(0.32)	(0.16)	(0.13)	(0.22)	(0.32)	(0.19)	(0.08)
Russian aggression 2014	-2.86***	-2.79***	-0.31*	-0.63***	-0.37*	-0.80**	-0.48**	-0.20*
	(0.47)	(0.38)	(0.16)	(0.11)	(0.20)	(0.32)	(0.21)	(0.10)
Russian aggression 2022	3.21**	-2.69***	-0.77***	-0.64***	0.45	-1.89***	-0.76***	-0.63***
	(1.26)	(0.63)	(0.28)	(0.09)	(0.28)	(0.32)	(0.19)	(0.07)
Observations	73	73	73	713	73	73	73	713
R-squared	0.39	0.42	0.15	0.24	0.18	0.38	0.25	0.36
Panel B. CPI inflation								
Global Financial Crisis	3.56***	2.59***	0.03	0.44	1.44***	0.96***	-0.15	0.24**
	(0.75)	(0.76)	(0.36)	(0.39)	(0.55)	(0.31)	(0.10)	(0.12)
COVID19 crisis	-2.52***	-3.40***	-0.56**	-1.14***	-0.67***	-1.34***	-0.22**	-0.39***
	(0.60)	(0.68)	(0.24)	(0.24)	(0.25)	(0.31)	(0.09)	(0.09)
Russian aggression 2014	4.94**	-0.52	-1.28***	-1.34***	-0.74***	-0.78**	-0.17*	-0.21**
	(2.18)	(0.74)	(0.24)	(0.25)	(0.27)	(0.32)	(0.10)	(0.09)
Russian aggression 2022	1.97	-1.83**	2.97***	1.02***	-0.21	-1.36***	-0.15	-0.24***
	(1.52)	(0.77)	(0.89)	(0.27)	(0.26)	(0.32)	(0.09)	(0.08)
Observations	73	73	73	713	73	73	73	713
R-squared	0.23	0.15	0.44	0.21	0.14	0.21	0.04	0.20

Notes: The table reports estimated coefficients in specification (1). Columns (4) and (8) include country fixed effects. Robust standard errors (Driscoll-Kraay in columns (4) and (8) and Newey-West in other columns) are reported in parentheses. ***,**,* indicate statistical significance at 1, 5 and 10 percent levels.

Table 4. Uncertainty spillovers.

	1-year ahead disagreement				5-year ahead disagreement			
	Ukraine	Russia	Poland	Eastern Europe	Ukraine	Russia	Poland	Eastern Europe
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: GDP								
Global Financial Crisis	0.44	0.35	0.18	0.35***	-0.01	0.47*	0.16***	0.23***
	(0.33)	(0.23)	(0.12)	(0.06)	(0.28)	(0.26)	(0.05)	(0.06)
COVID-19 crisis	0.23***	0.55**	0.59**	0.88***	-0.17***	-0.21***	-0.09	-0.07***
	(0.08)	(0.25)	(0.25)	(0.10)	(0.06)	(0.06)	(0.08)	(0.02)
Russian aggression 2014	0.99***	0.39***	-0.17***	-0.09***	0.02	0.29***	-0.03	0.04
	(0.16)	(0.13)	(0.04)	(0.02)	(0.07)	(0.08)	(0.07)	(0.04)
Russian aggression 2022	3.68**	0.26	0.07	0.11***	0.63*	-0.21**	-0.01	0.01
	(1.84)	(0.18)	(0.08)	(0.03)	(0.36)	(0.09)	(0.05)	(0.03)
Observations	73	73	73	713	63	63	63	663
R-squared	0.29	0.25	0.33	0.44	0.19	0.33	0.06	0.12
Panel B. CPI inflation								
Global Financial Crisis	0.50**	0.39	-0.06	0.33***	0.38	0.15*	0.09*	0.17***
	(0.22)	(0.28)	(0.03)	(0.10)	(0.39)	(0.08)	(0.05)	(0.05)
COVID-19 crisis	0.07	-0.31	0.13***	0.20**	0.26**	-0.25**	-0.13***	-0.06**
	(0.17)	(0.22)	(0.05)	(0.09)	(0.11)	(0.12)	(0.03)	(0.03)
Russian aggression 2014	2.41***	0.44*	-0.09**	-0.03	-0.04	0.04	-0.03	-0.03
	(0.86)	(0.26)	(0.04)	(0.04)	(0.20)	(0.10)	(0.03)	(0.02)
Russian aggression 2022	0.87	0.30	0.59***	0.52***	0.02	0.43***	-0.08	0.02
	(0.59)	(0.29)	(0.21)	(0.08)	(0.11)	(0.12)	(0.05)	(0.02)
Observations	73	73	73	713	63	63	63	663
R-squared	0.29	0.06	0.40	0.19	0.07	0.27	0.14	0.28

The table reports estimated coefficients in specification (1). Columns (4) and (8) include country fixed effects. Robust standard errors (Driscoll-Kraay in columns (4) and (8) and Newey-West in other columns) are reported in parentheses. ***,**,* indicate statistical significance at 1, 5 and 10 percent levels.

Table 5. War intensity and spillovers.

	Consensus forecast		Disagreement	
	coef.	s.e.	coef.	s.e.
	(1)	(2)	(3)	(4)
Panel A. GDP				
Ukraine	-2.42**	(1.09)	1.33***	(0.20)
Russia	-1.42***	(0.27)	0.21***	(0.03)
Bulgaria	-0.32***	(0.12)	0.06***	(0.02)
Romania	-0.24***	(0.10)	0.02	(0.02)
Poland	-0.35*	(0.18)	0.07***	(0.02)
Czechia	-0.44***	(0.17)	0.06***	(0.02)
Slovakia	-0.49***	(0.19)	0.07***	(0.02)
Slovenia	-0.18	(0.17)	0.05***	(0.02)
Hungary	-0.37	(0.23)	0.08***	(0.02)
Croatia	-0.07	(0.14)	0.07***	(0.02)
Estonia	-0.46***	(0.18)	0.13**	(0.06)
Latvia	-0.54***	(0.19)	0.05***	(0.02)
Lithuania	-0.48***	(0.14)	0.11***	(0.02)
Eastern Europe (average)	-0.36**	(0.16)	0.07***	(0.02)
Panel B. CPI inflation				
Ukraine	2.47***	(0.46)	0.84***	(0.15)
Russia	1.53***	(0.47)	0.40***	(0.05)
Bulgaria	1.78***	(0.21)	0.48***	(0.10)
Romania	1.76***	(0.27)	0.23***	(0.04)
Poland	2.30***	(0.37)	0.28***	(0.06)
Czechia	1.78***	(0.23)	0.27***	(0.04)
Slovakia	1.74***	(0.31)	0.37***	(0.09)
Slovenia	1.20***	(0.17)	0.27***	(0.02)
Hungary	2.20***	(0.61)	0.32***	(0.11)
Croatia	1.36***	(0.19)	0.19***	(0.02)
Estonia	1.73***	(0.26)	0.30***	(0.06)
Latvia	1.55***	(0.29)	0.26***	(0.06)
Lithuania	1.72***	(0.22)	0.27***	(0.03)
Eastern Europe (average)	1.74***	(0.26)	0.29***	(0.05)
Panel C. Budget balance				
Ukraine	-4.70***	(1.03)	1.23***	(0.19)
Russia	-0.40*	(0.21)	0.28***	(0.06)
Bulgaria	-0.68***	(0.15)	0.12***	(0.03)
Romania	-0.50***	(0.14)	0.02	(0.01)
Poland	-0.50***	(0.19)	0.07***	(0.02)
Czechia	-0.80***	(0.23)	0.02	(0.03)
Slovakia	-0.85***	(0.27)	0.08**	(0.04)
Slovenia	-0.60***	(0.19)	0.09***	(0.02)
Hungary	-0.51***	(0.16)	0.04*	(0.02)
Croatia	-0.21	(0.14)	0.00	(0.02)
Estonia	-0.61***	(0.20)	0.08**	(0.03)
Latvia	-0.56***	(0.14)	0.15***	(0.04)
Lithuania	-0.59***	(0.17)	0.05	(0.04)
Eastern Europe (average)	-0.58***	(0.16)	0.06***	(0.02)

The table reports estimated coefficients in specification (2). Robust standard errors (Driscoll-Kraay for Eastern European averages; Newey-West in other rows) are reported in parentheses. ***,**,* indicate statistical significance at 1, 5 and 10 percent levels.

Table 6. Hysteresis in GDP forecasts.

Dep. Var.: LT forecast	Consensus forecast			Forecast disagreement		
	Eastern Europe	Ukraine	Russia	Eastern Europe	Ukraine	Russia
	(1)	(2)	(3)	(4)	(5)	(6)
ST forecast: normal	0.22***	0.21***	0.37***	0.21**	-0.07	0.71***
	(0.08)	(0.06)	(0.09)	(0.09)	(0.08)	(0.17)
ST forecast: COVID-19	0.02	-0.08***	0.08***	-0.02	-0.06***	-0.13***
	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.05)
ST forecast: GFC	0.04	0.10***	0.04	0.12	0.54***	0.80***
	(0.02)	(0.02)	(0.06)	(0.08)	(0.05)	(0.08)
ST forecast: Invasion	0.09**	-0.02	-0.01	0.36**	0.22***	-0.10
	(0.04)	(0.02)	(0.01)	(0.14)	(0.05)	(0.13)
Observations	733	77	77	663	63	63
R-squared	0.29	0.41	0.62	0.10	0.64	0.58

Notes: The table reports estimated coefficients in specification (4). Columns (1) and (4) include country fixed effects. Robust standard errors (Driscoll-Kraay in columns (1) and (4) and Newey-West in other columns) are reported in parentheses. ***,**,* indicate statistical significance at 1, 5 and 10 percent levels.

Figure 1. Macroeconomic trends.

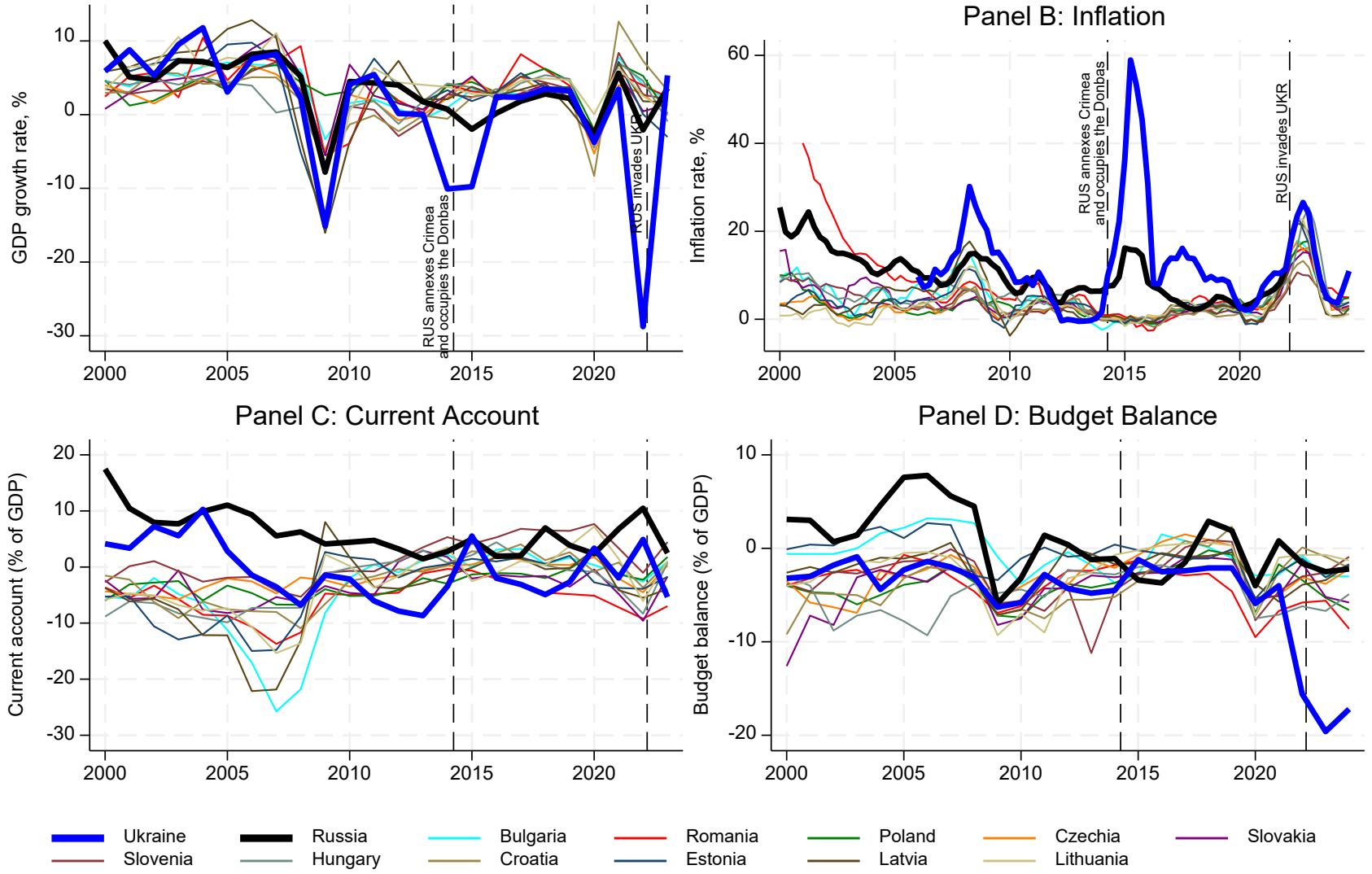


Figure 2. Forecasts vs. realized macroeconomic data.

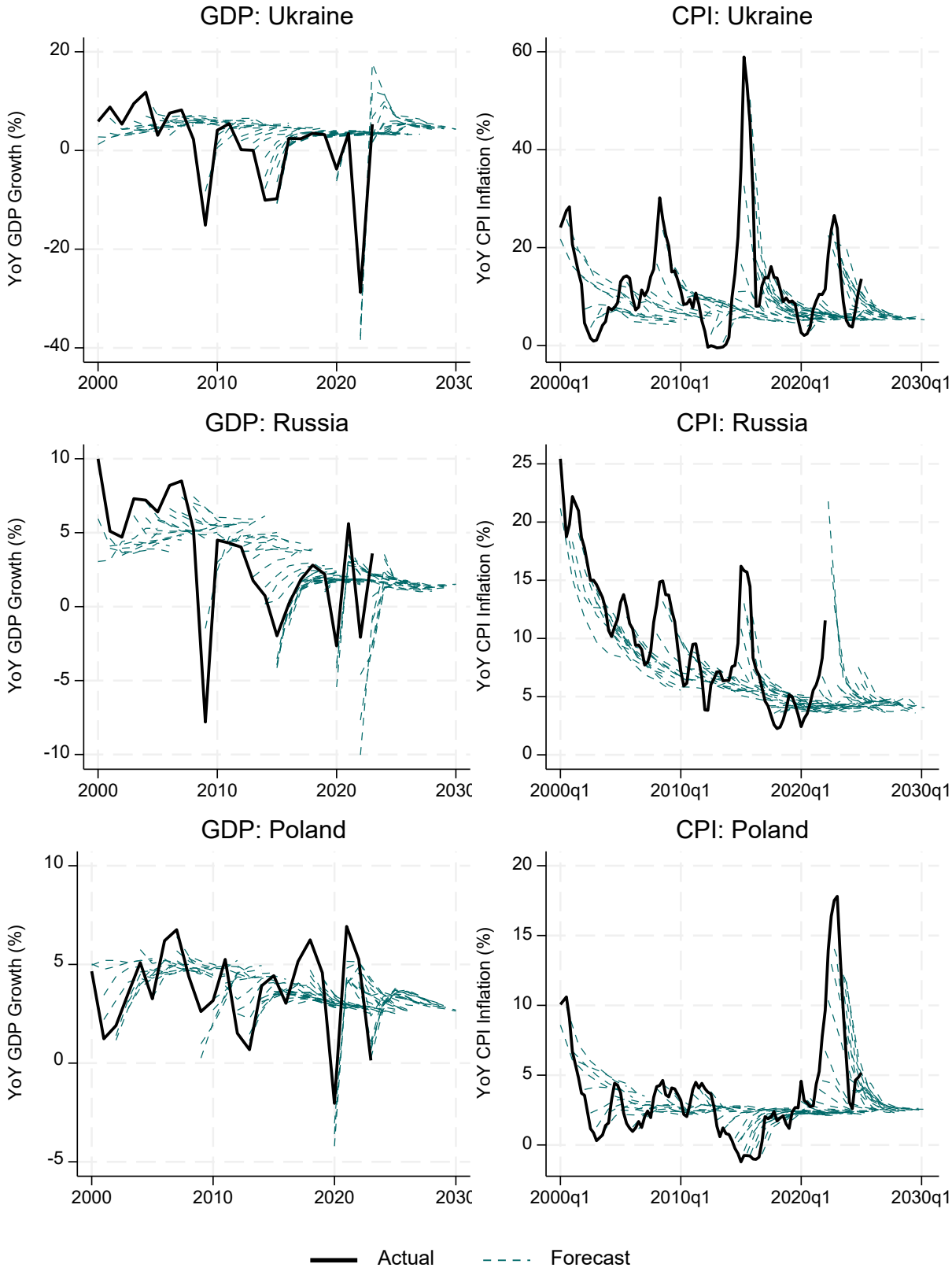


Figure 3.Comovement in macroeconomic forecasts.

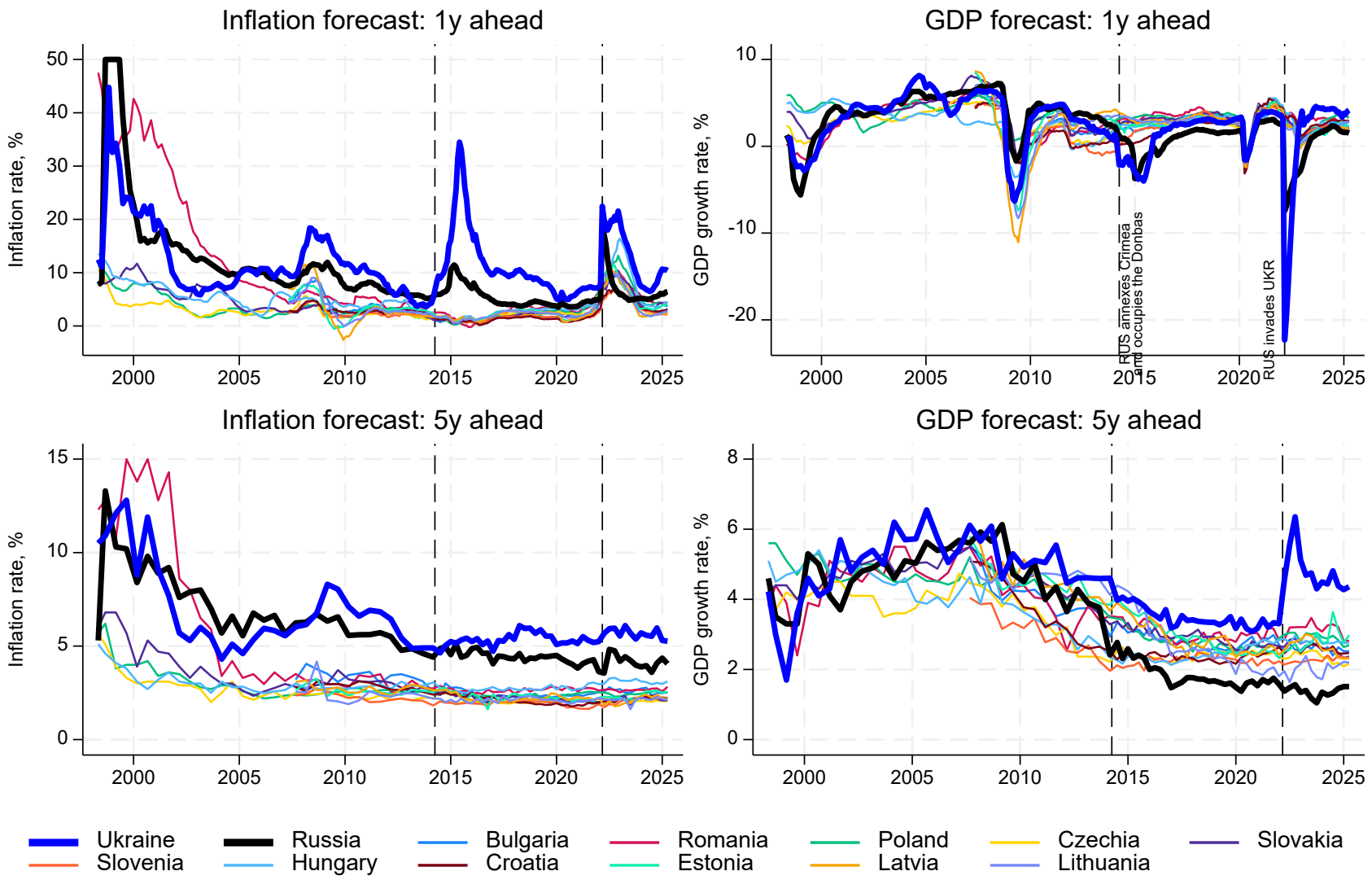


Figure 4. Event (Russia's full-scale invasion of Ukraine, 2022) response: consensus forecasts.

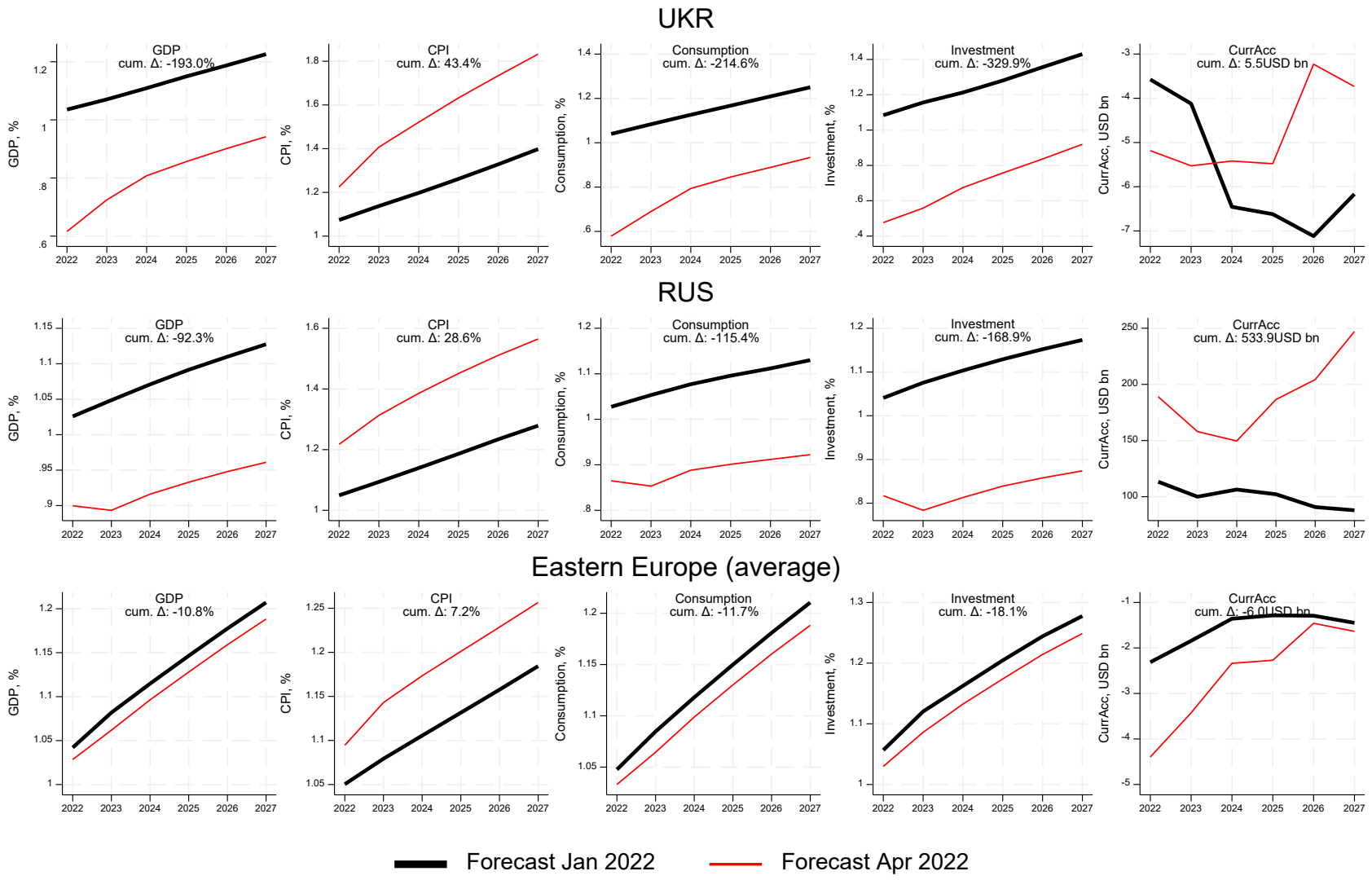


Figure 5. Event (Russia's illegal annexation of Crimea and partial occupation of the Donbas) response in 2014: consensus forecasts.

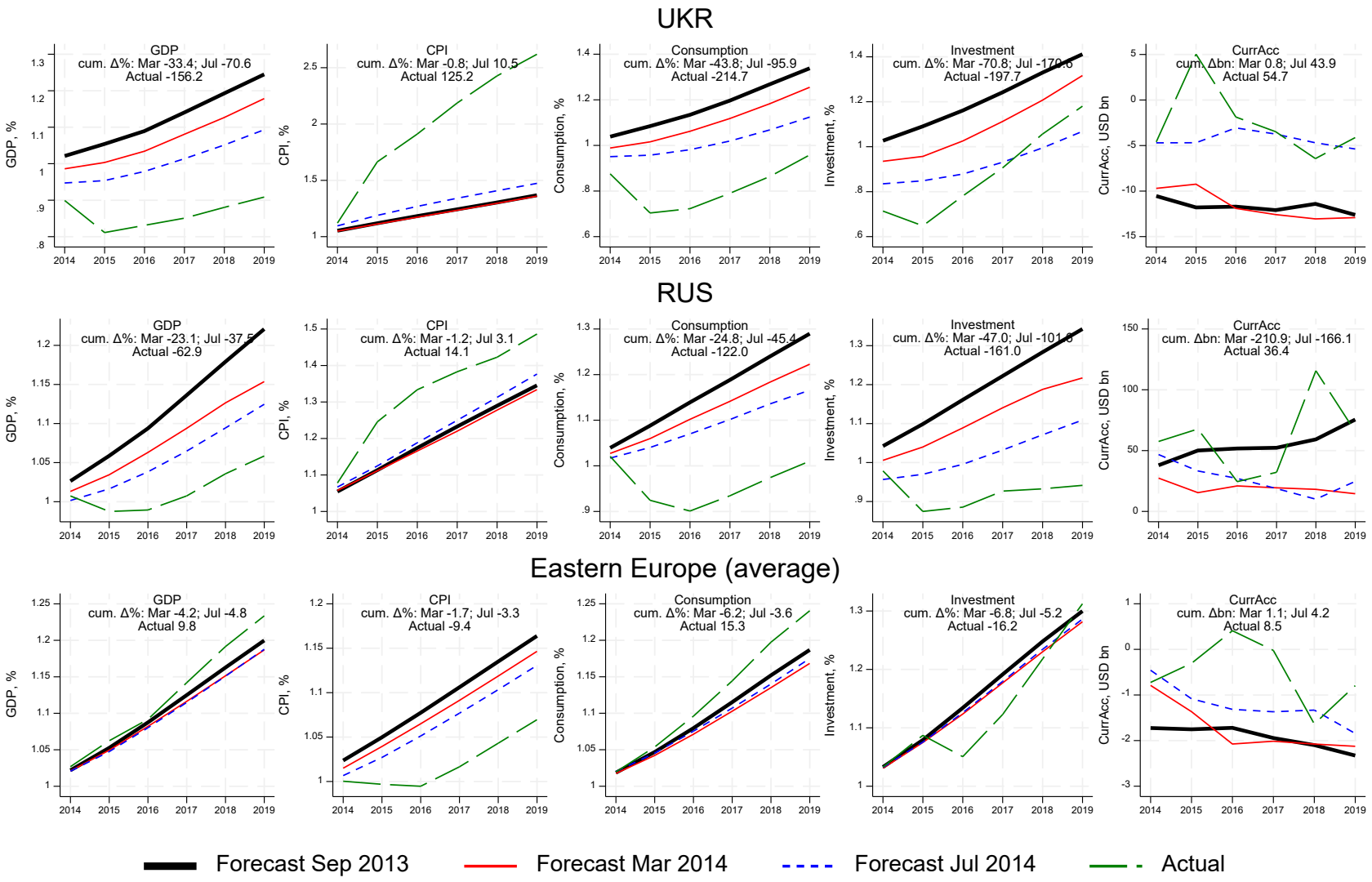


Figure 6. Event (Russia's full-scale invasion of Ukraine, 2022) response: forecast disagreement.

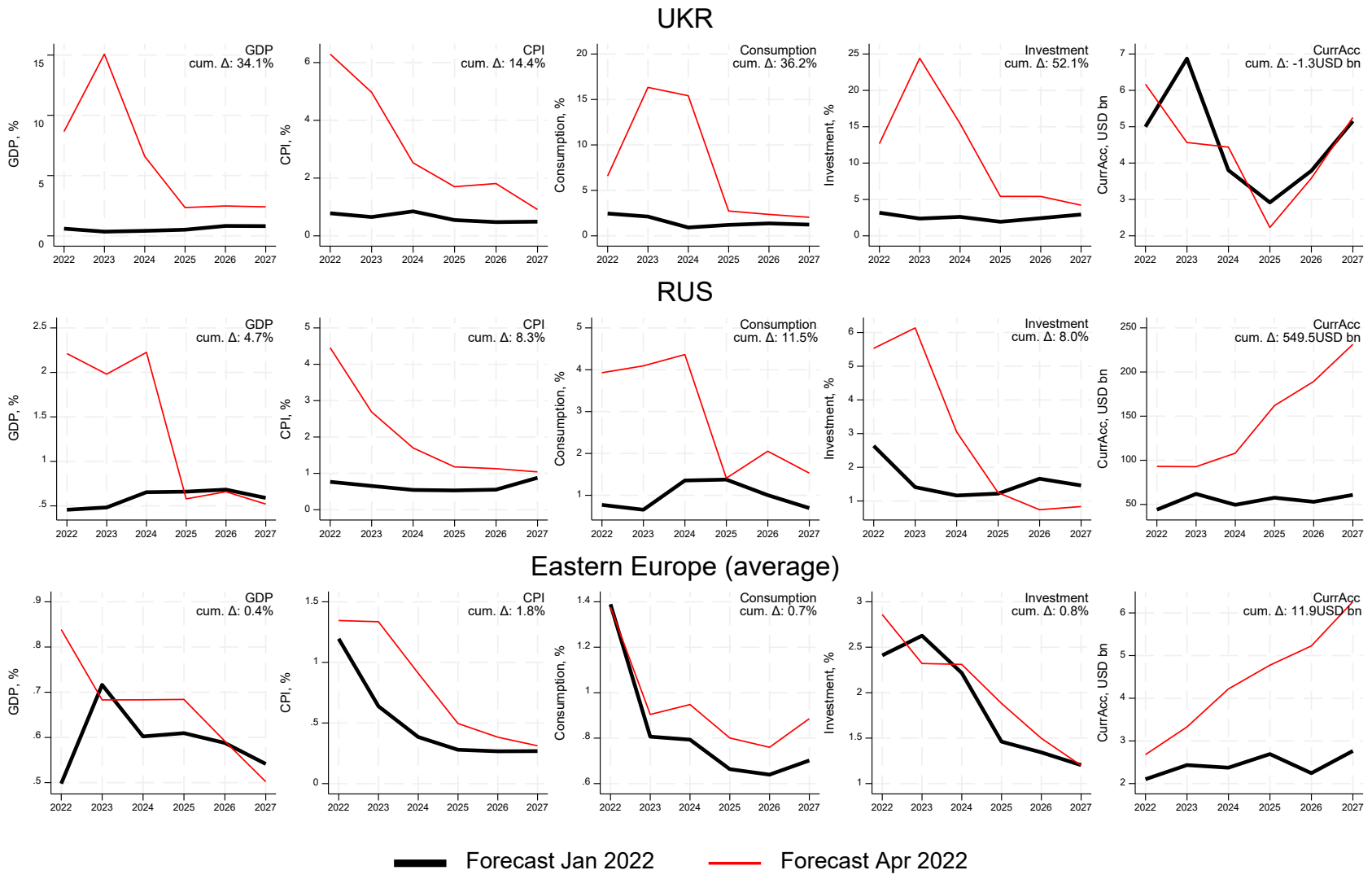
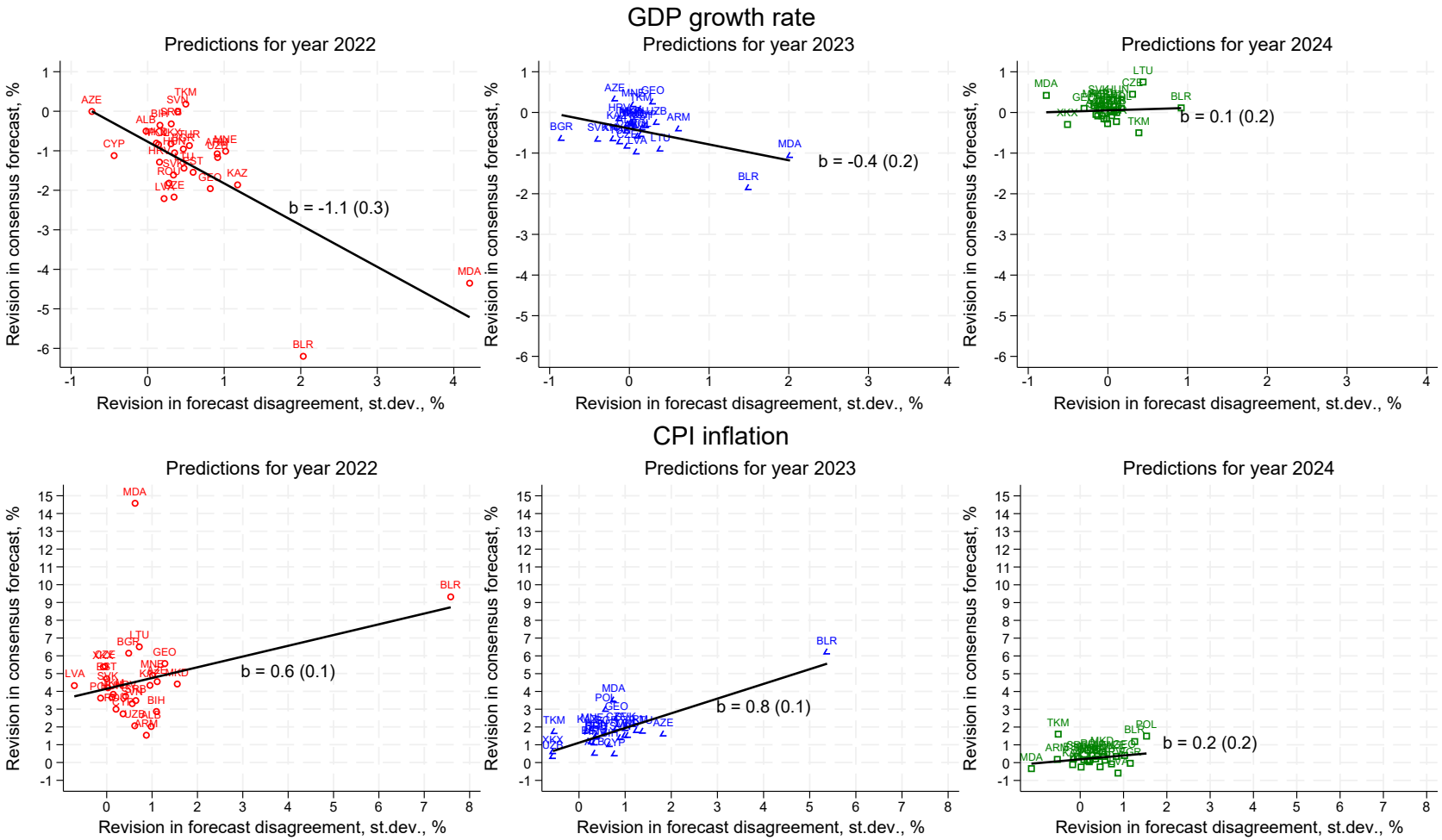
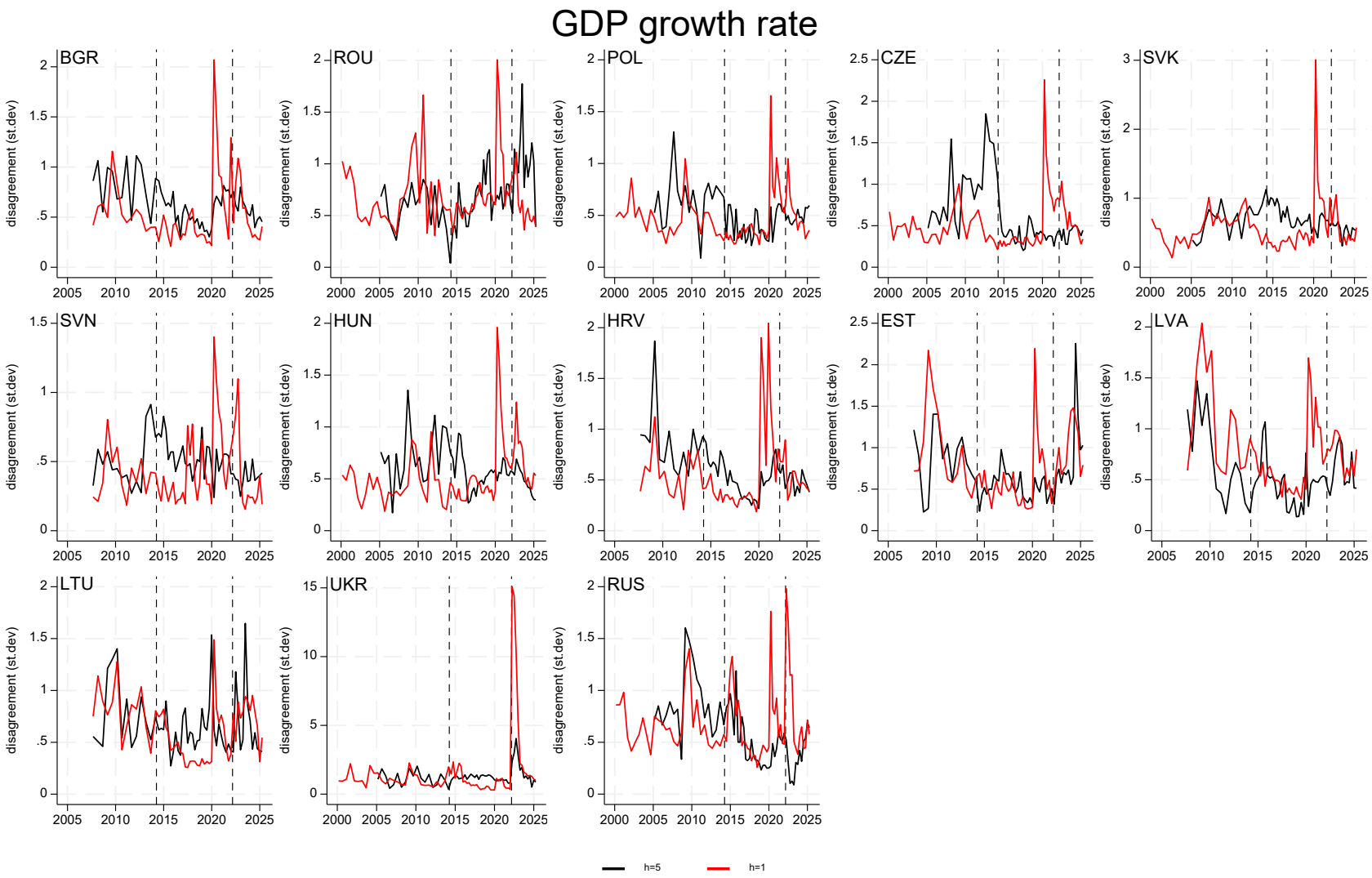


Figure 7. Relationship between revisions in forecast disagreement and consensus forecast.



Notes: the horizontal axis measures revisions (from January 2022 to April 2022) in the cross-sectional standard deviation for forecasts. The vertical axis measures revisions (from January 2022 to April 2022) in the consensus (mean) forecast. The lines show fitted relationship with the corresponding slope and standard errors in parentheses.

Figure 8. Disagreement in short-term and long-term forecasts.



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CPI inflation rate

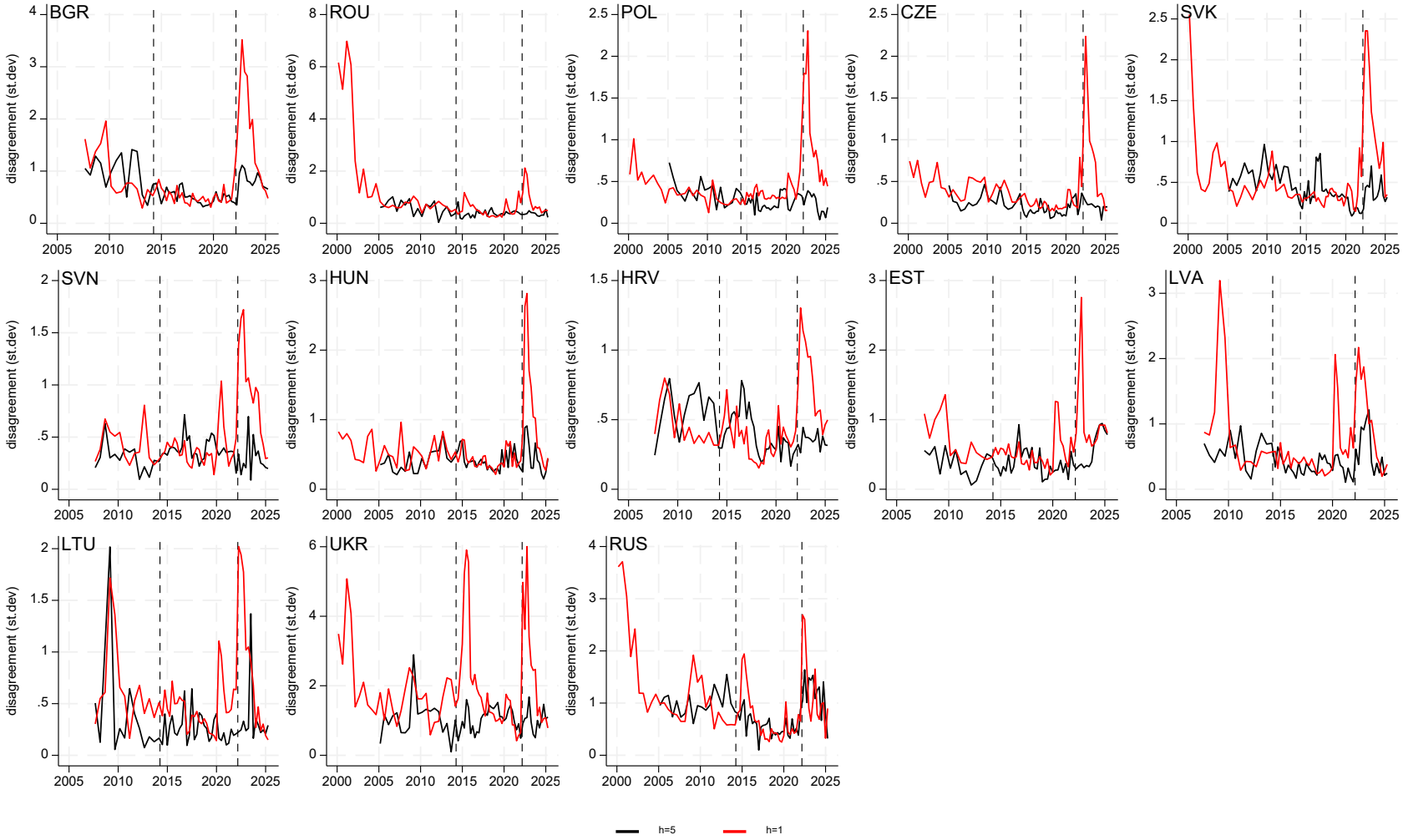


Figure 9. Decoupling of long-term trends: Ukraine vs. Eastern Europe.

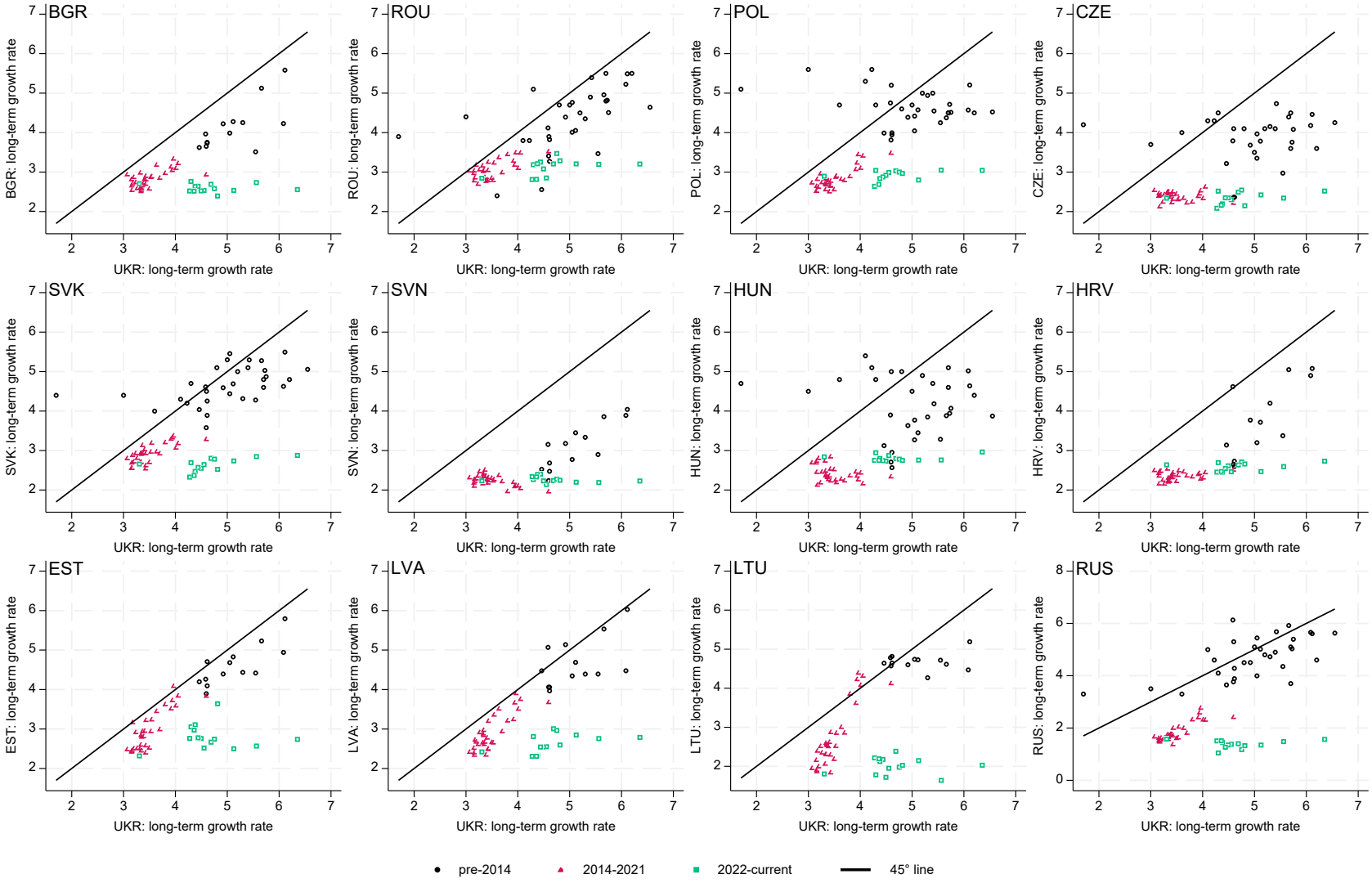


Figure 10. Decoupling of long-term trends: Russia vs. Eastern Europe.

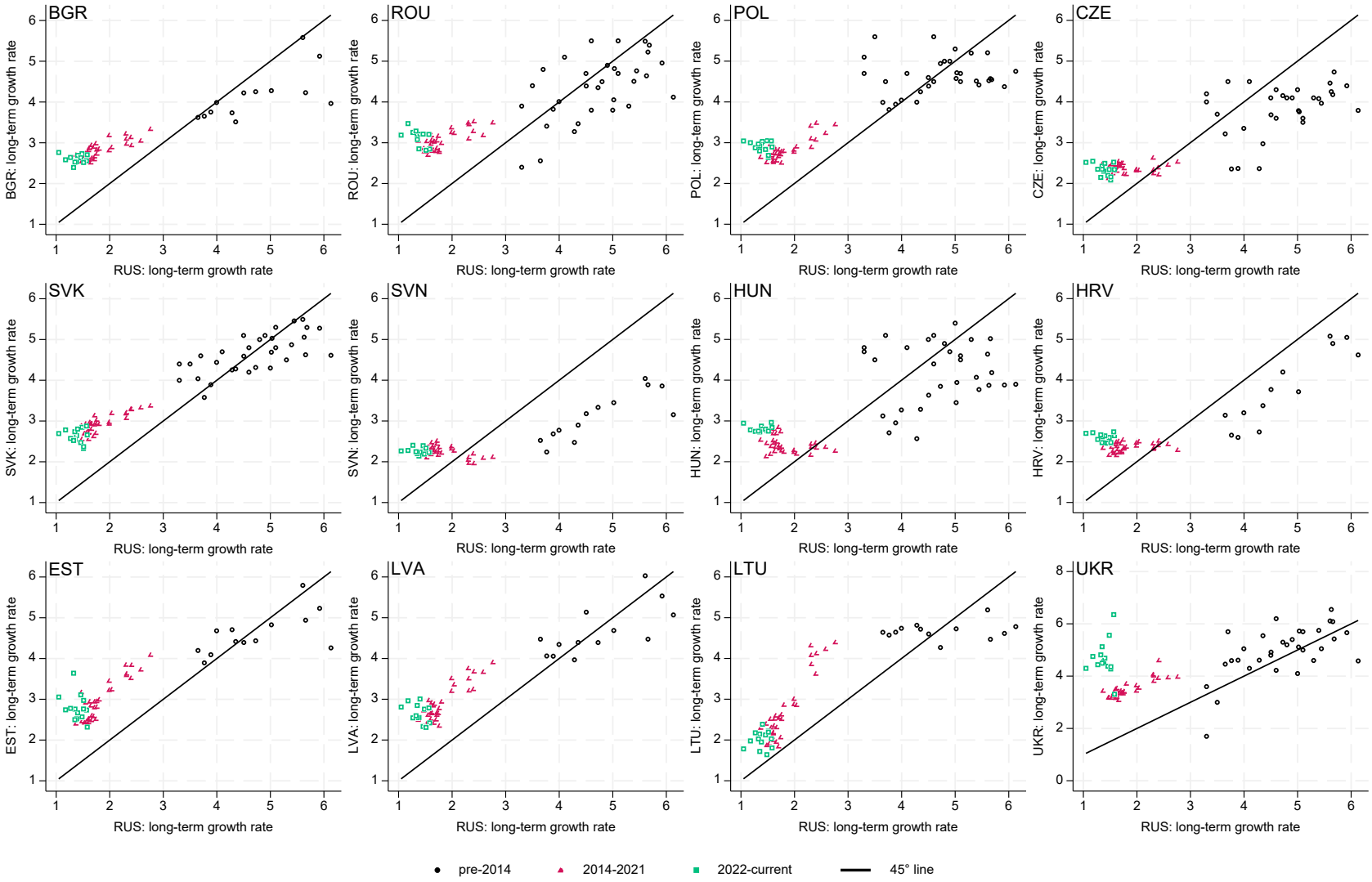


Figure 11. Regional Distance vs War Cost.

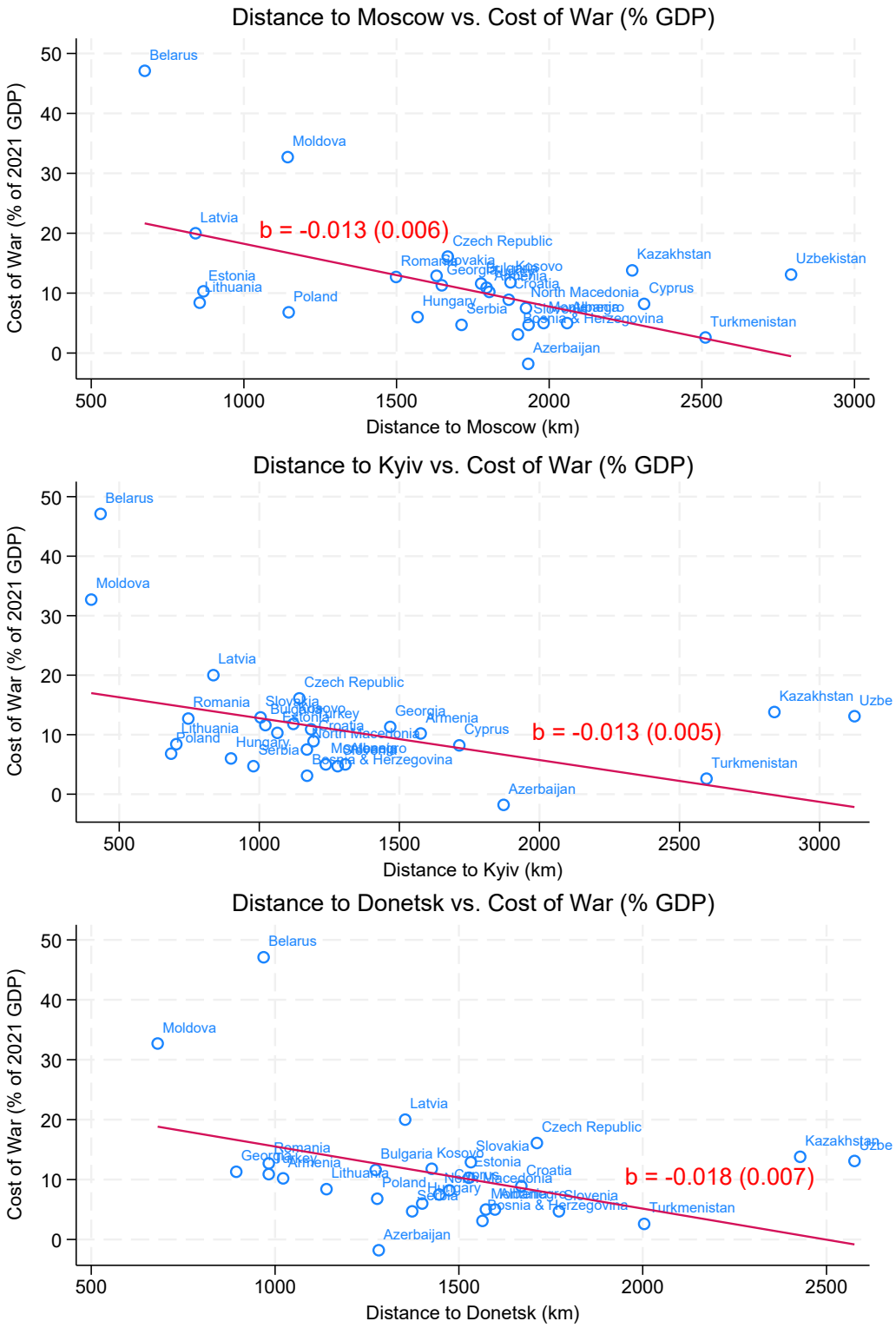
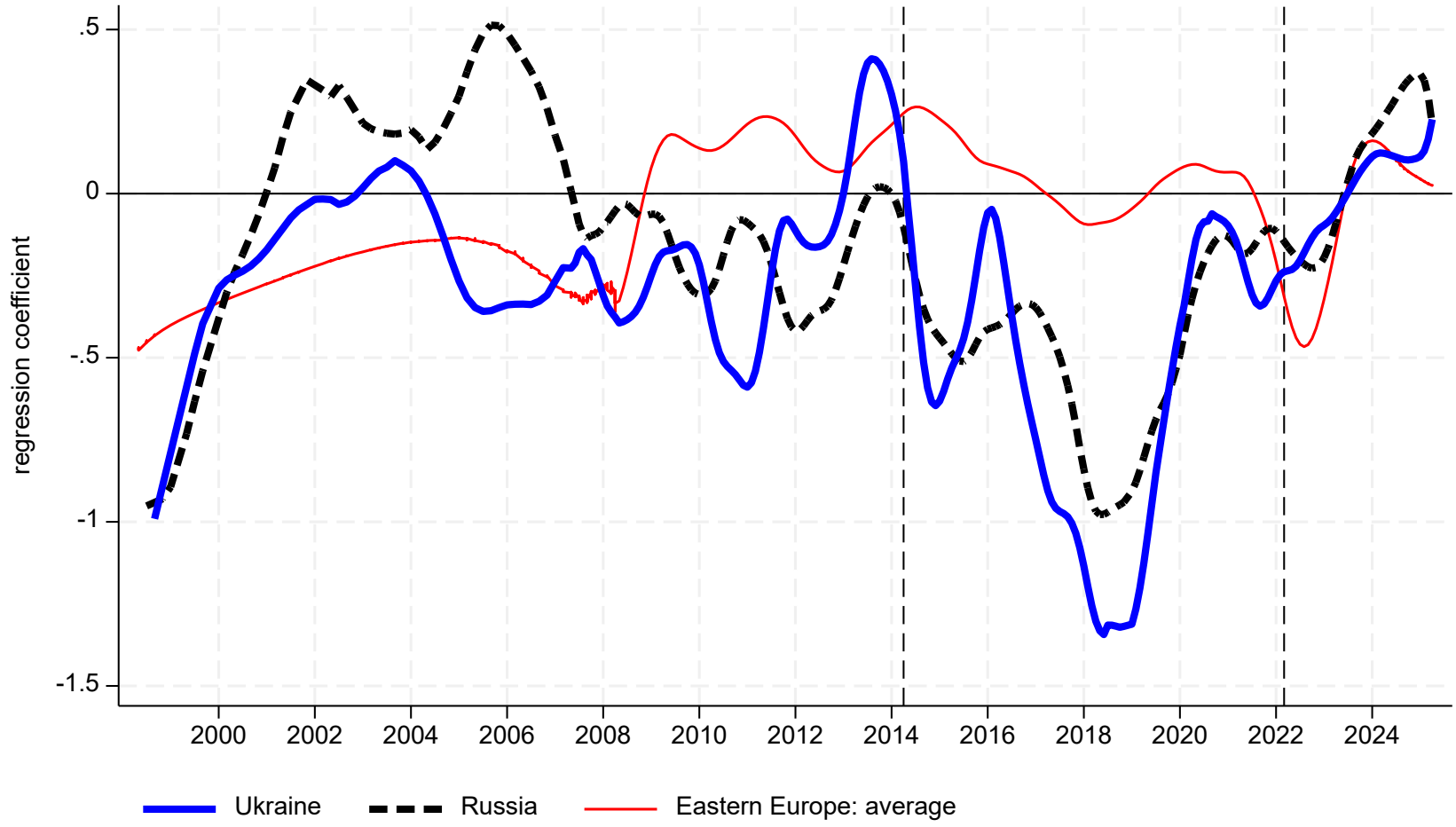
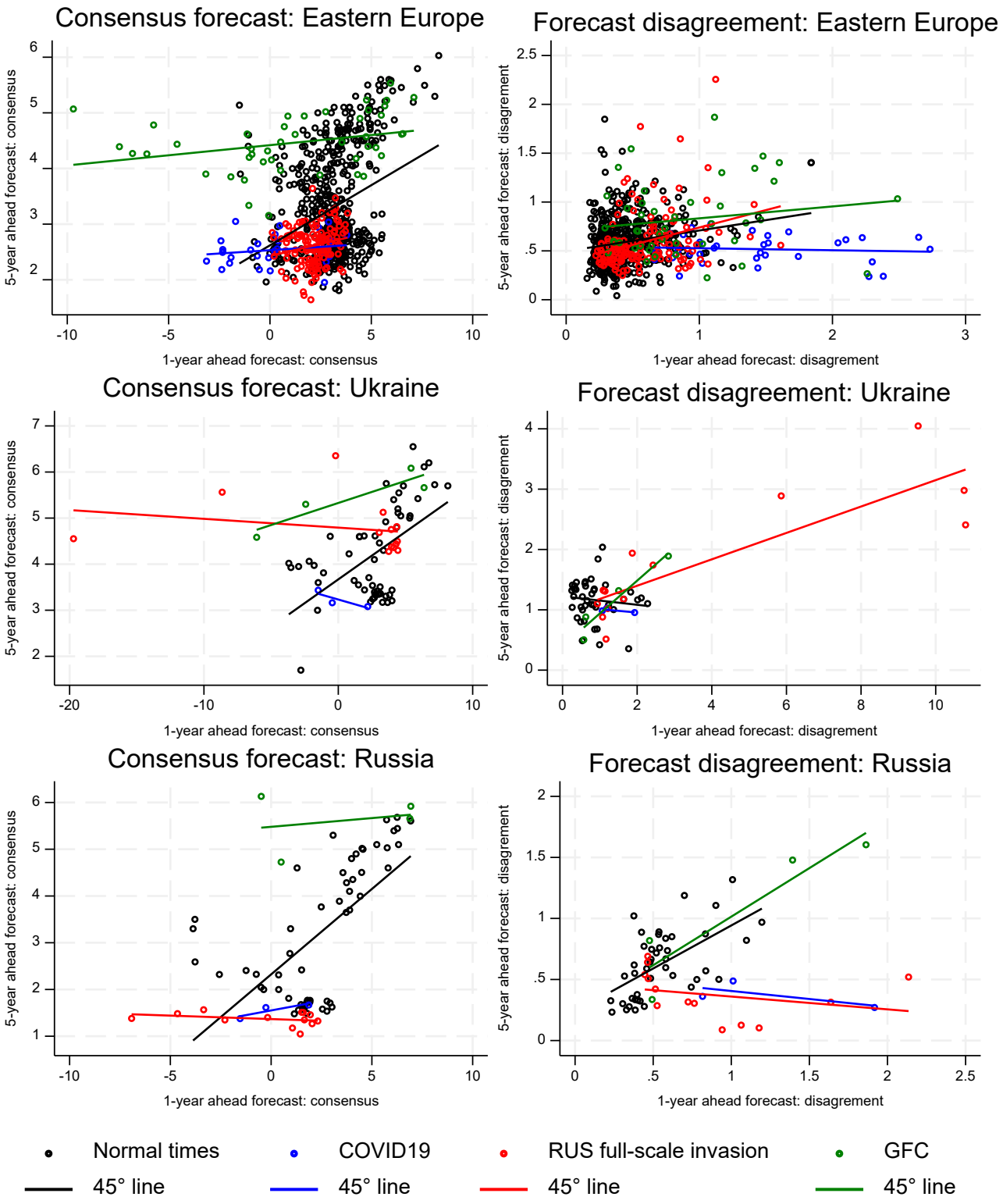


Figure 12. Sources of business cycles.



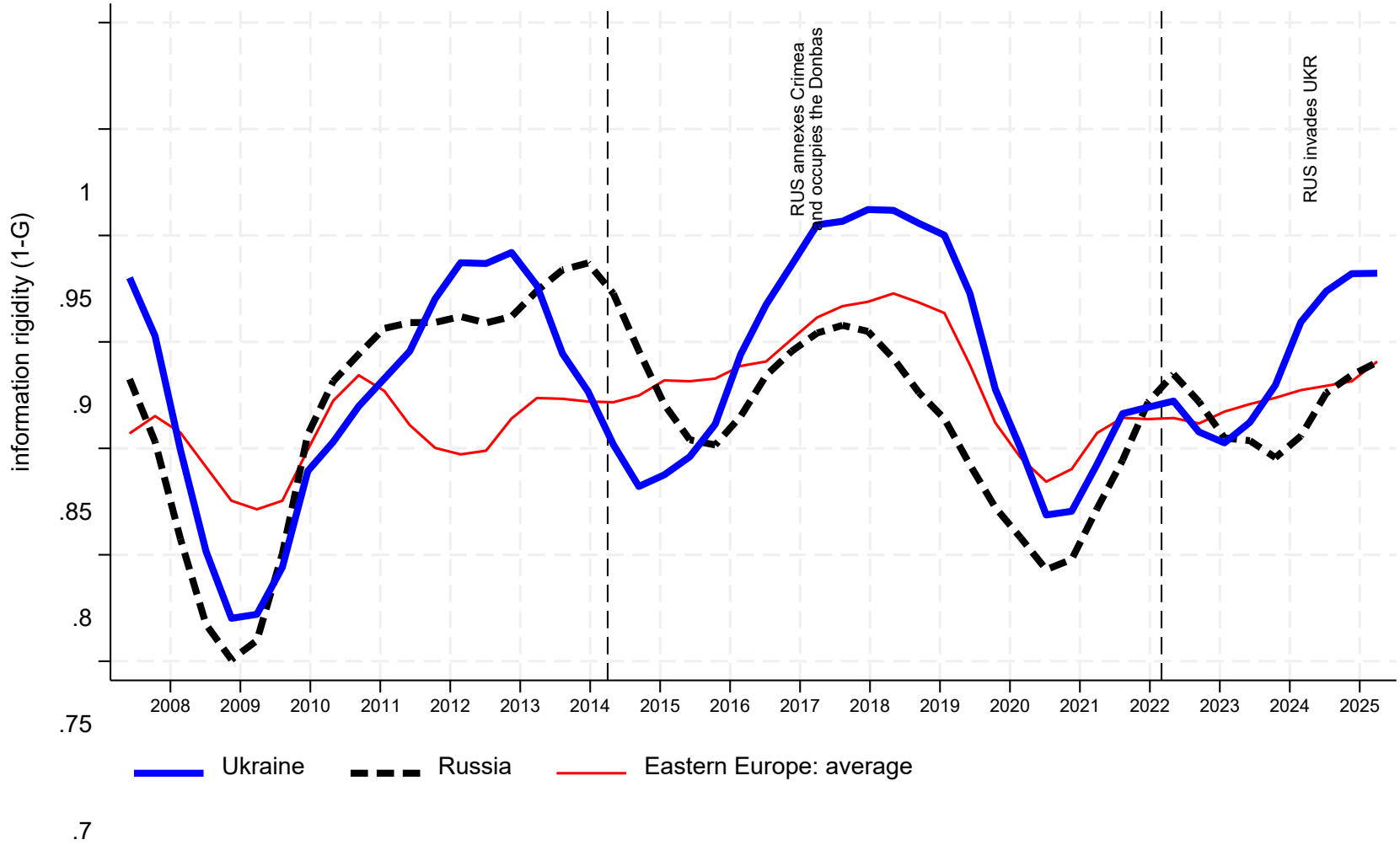
Notes: the figure plots time series of smoothed (lowess; bandwidth 0.1; months correspond to 1/12 of the time unit, i.e., January 2020 is 2020, February 2020 is 2020.083, March 2020 is 2020.166, etc.) monthly coefficient β_t in specification (3).

Figure 13. Hysteresis in consensus forecasts.



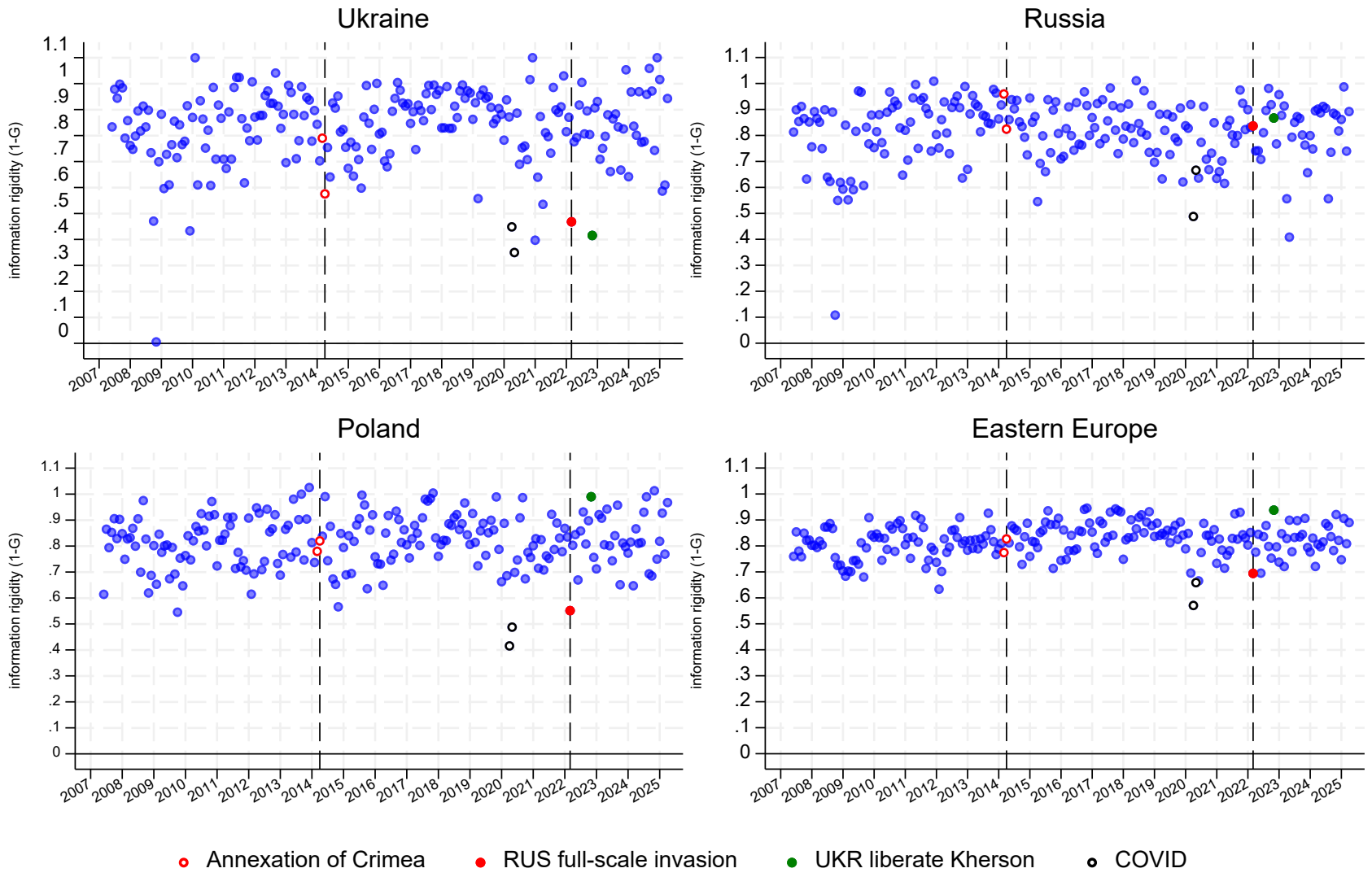
Notes: the periods are defines as follows: GFC (2008M1-2009M12), COVID-19 crisis (2020M3-2020M12), the full-scale invasion period (2022M2-2025), and garden-variety business cycles (the rest of the sample).

Figure 14. Information rigidity.



Notes: the figure plots time series of smoothed (lowess; bandwidth 0.1; months correspond to 1/12 of the time unit, i.e., January 2020 is 2020, February 2020 is 2020.083, March 2020 is 2020.166, etc.) monthly coefficient β_t in specification (5).

Figure 15. Information rigidity at high frequencies.



Notes: the figure plots time series of monthly coefficient β_t in specification (5).

Figure 16. Mean absolute revision in forecasts.

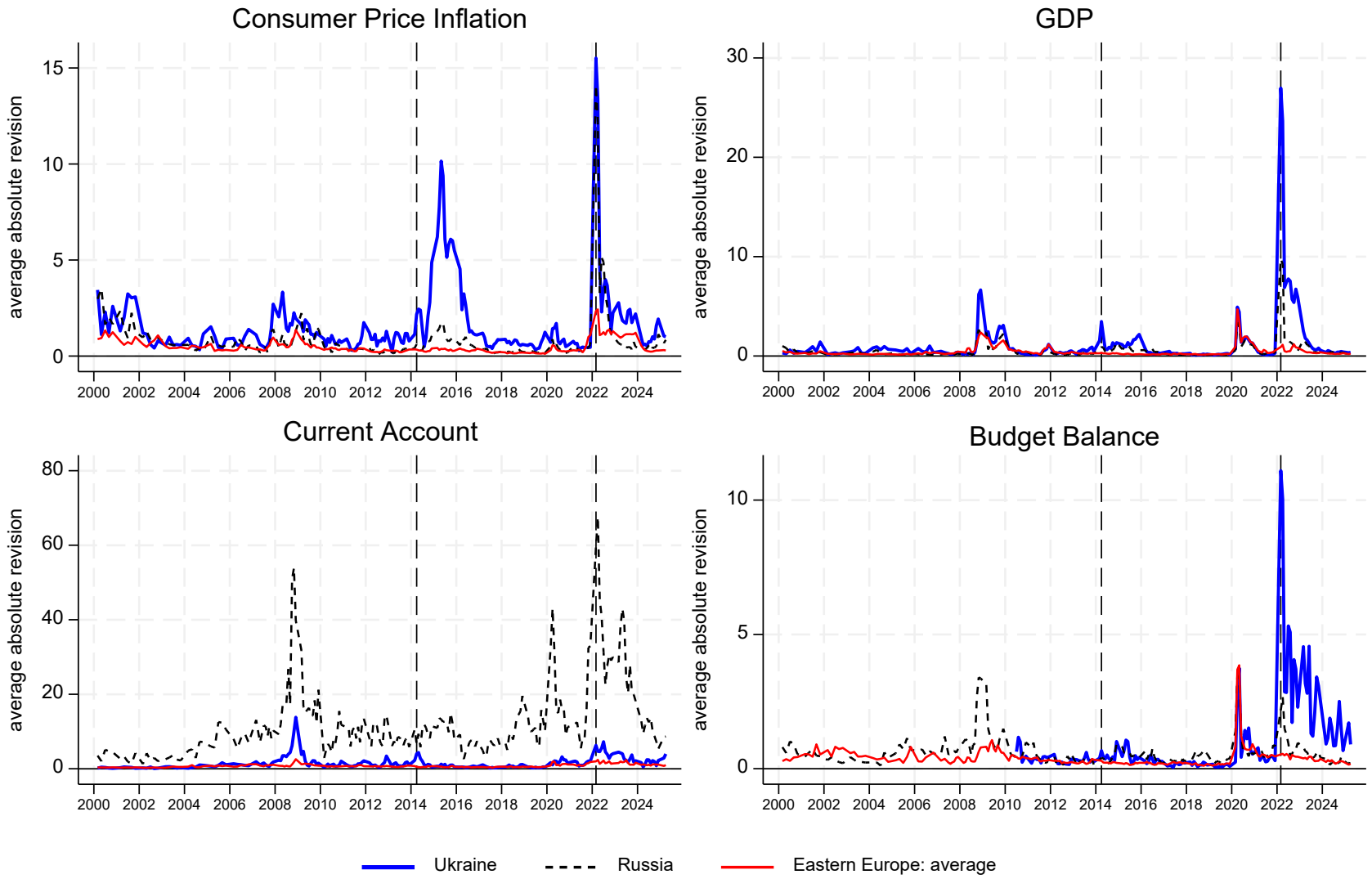
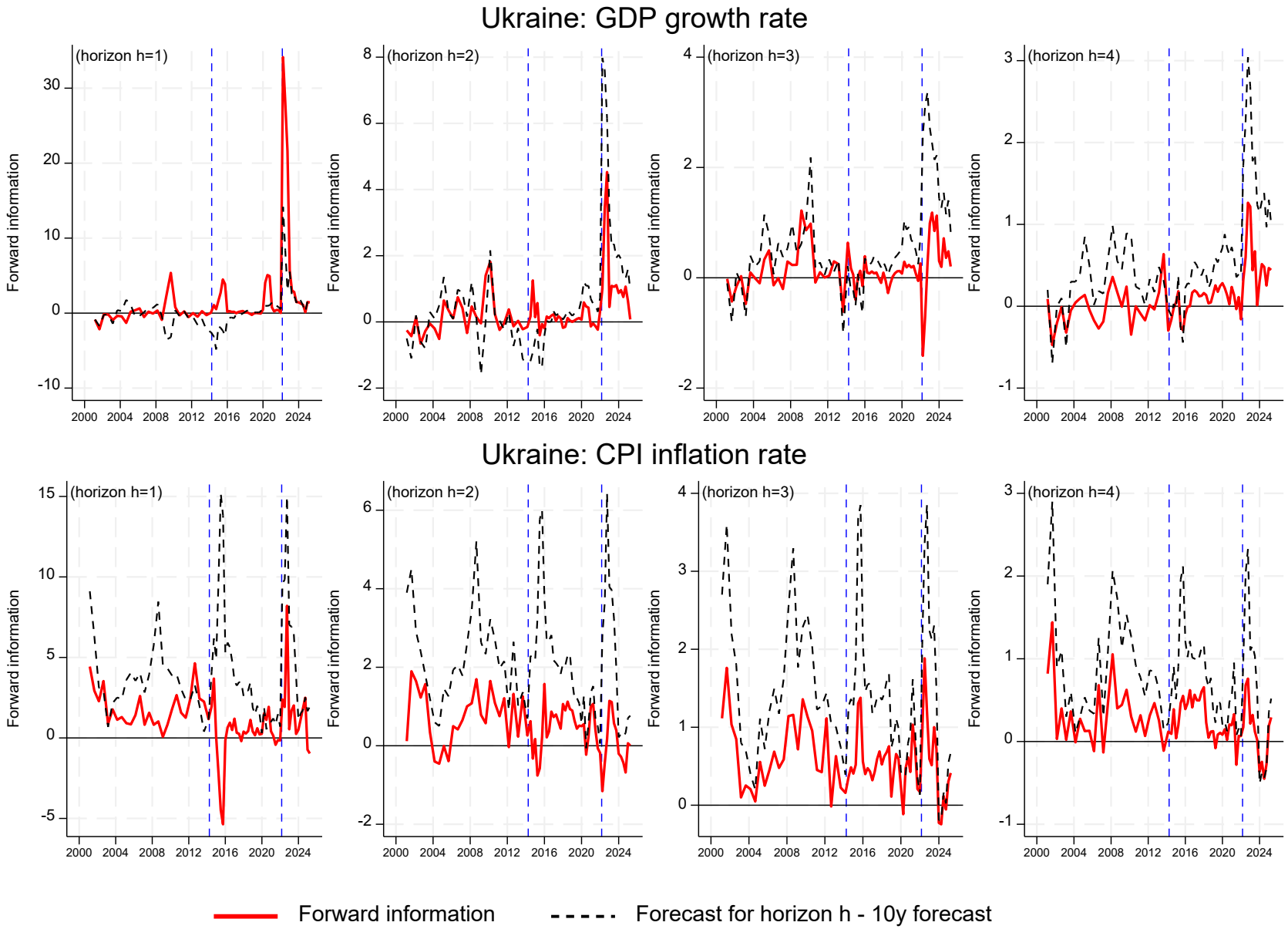


Figure 17. Forward information.



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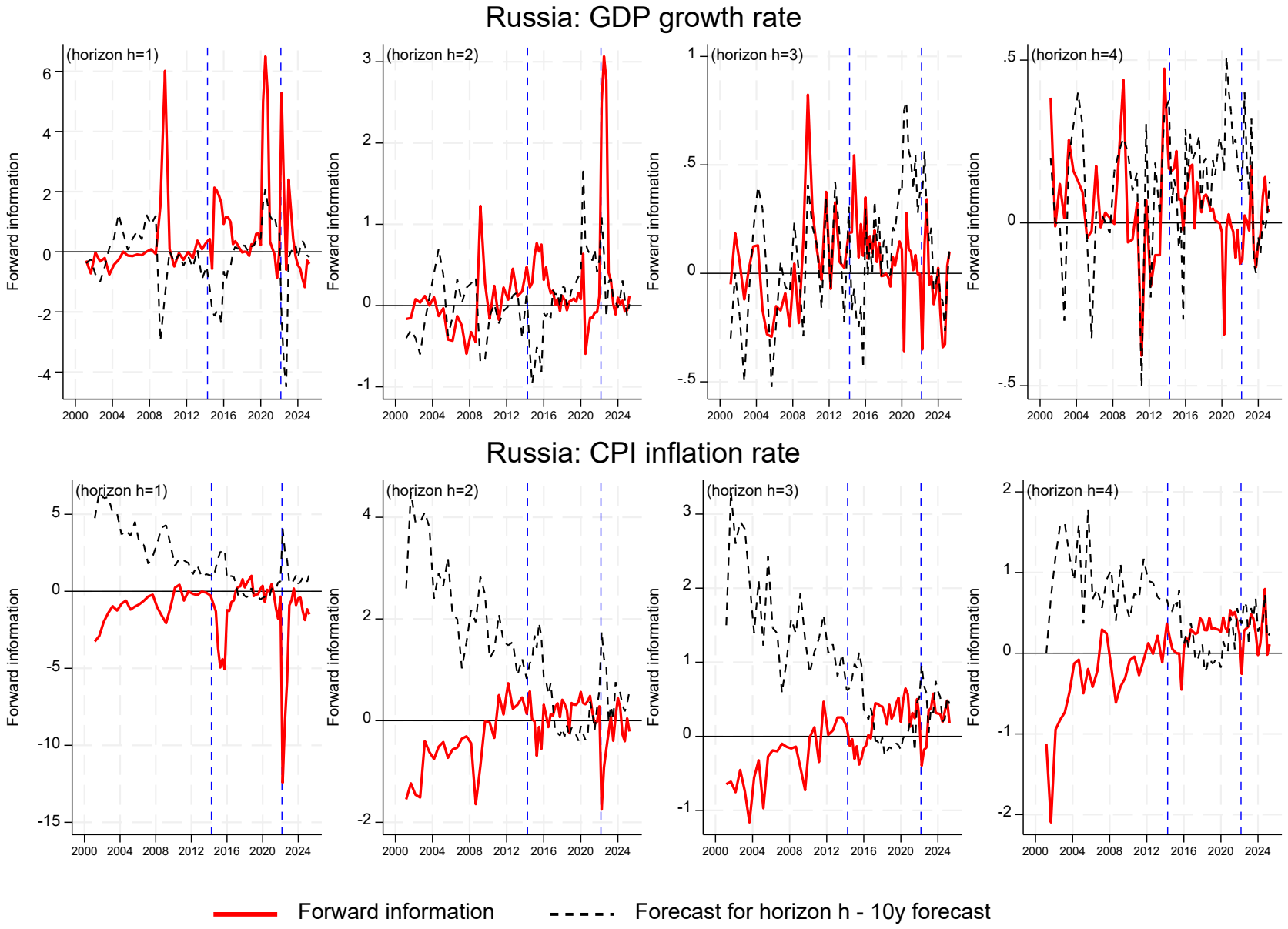

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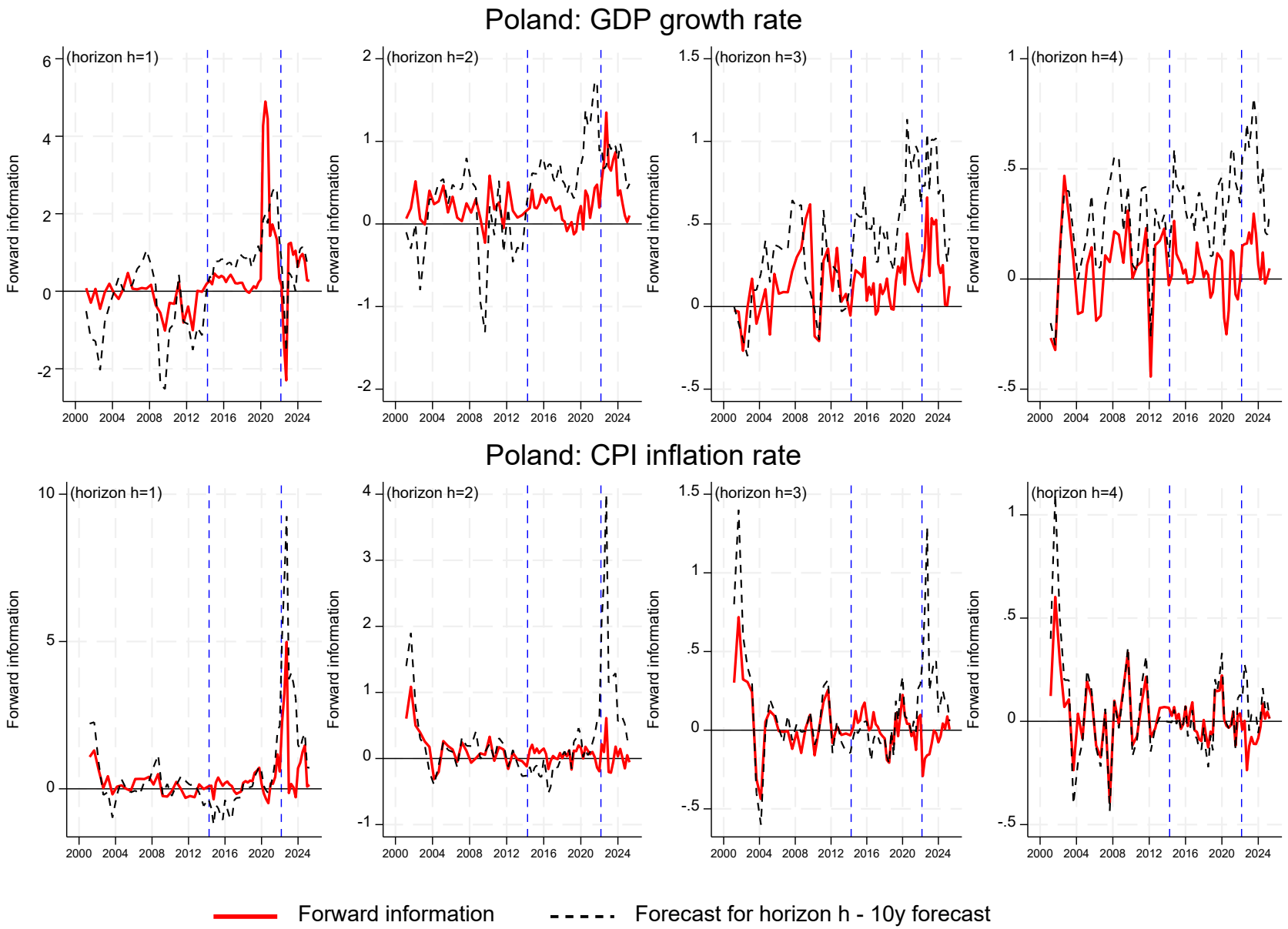


Notes: the figure plots time series of macroeconomic forecasts for inflation and GDP after removing trends (i.e., subtracting 10-year-ahead forecast) as well as forward information extracted using the approach in Goldstein and Gorodnichenko (2022).

Figure 18. Standard deviation of forecast revisions.

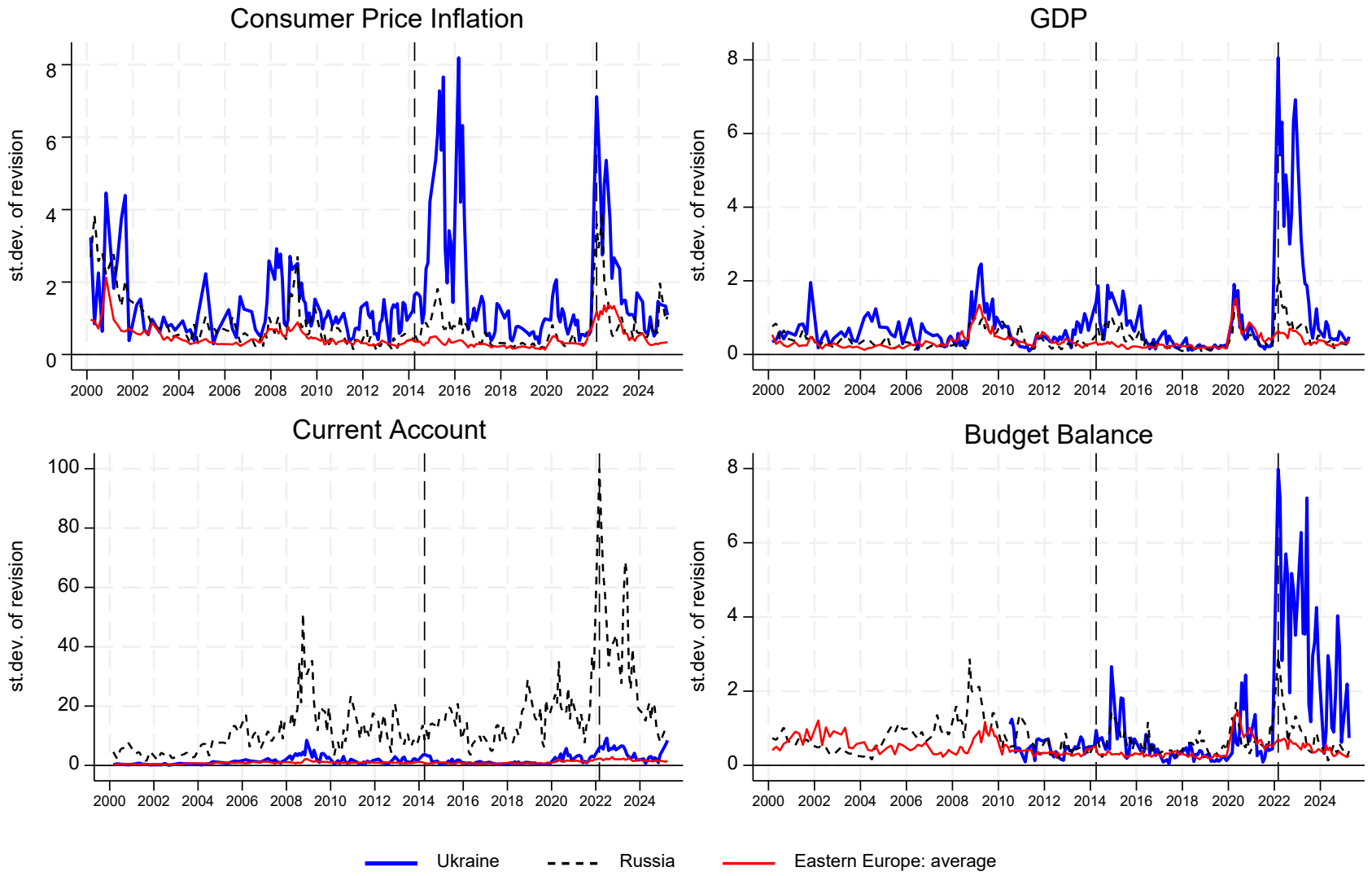
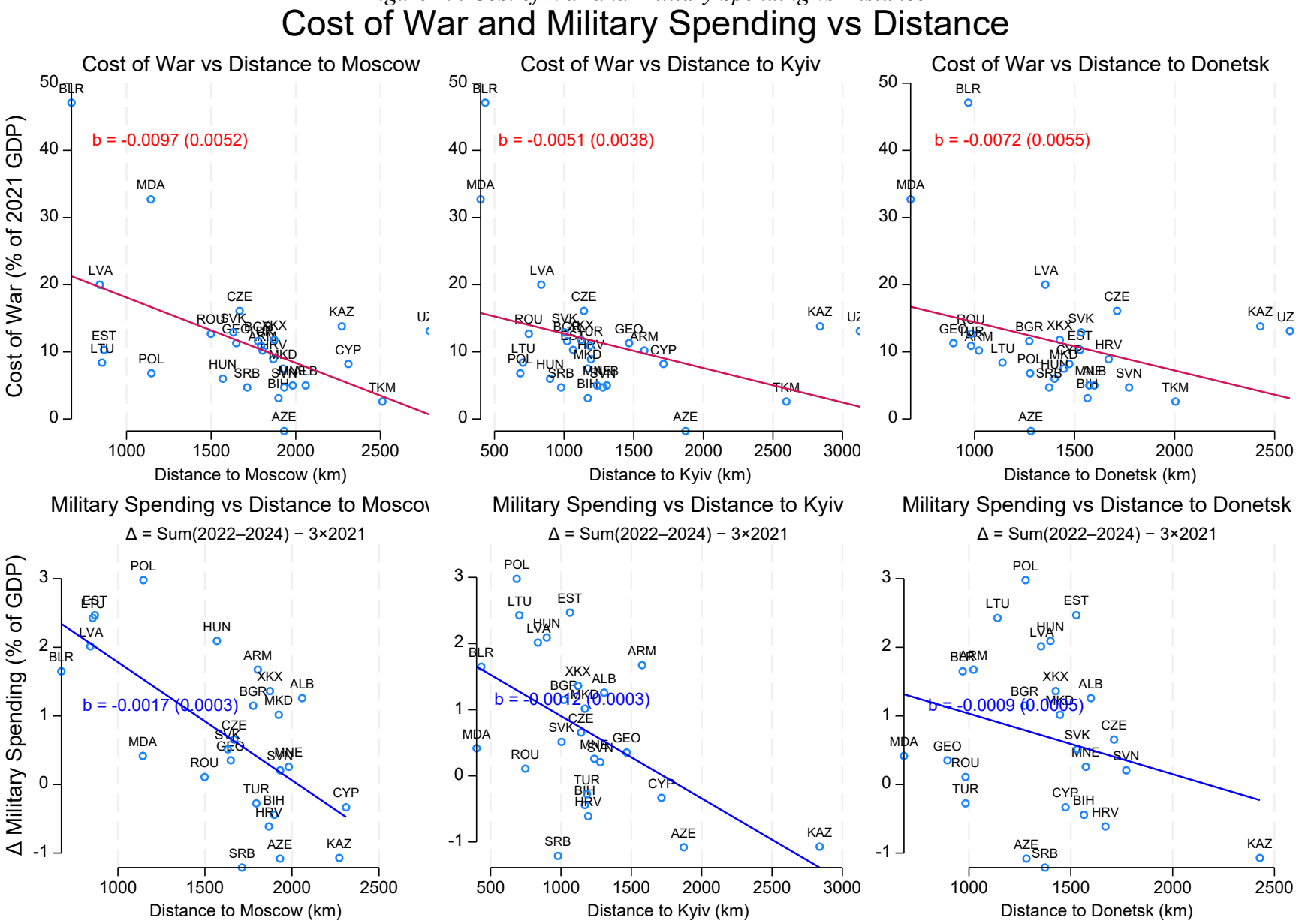
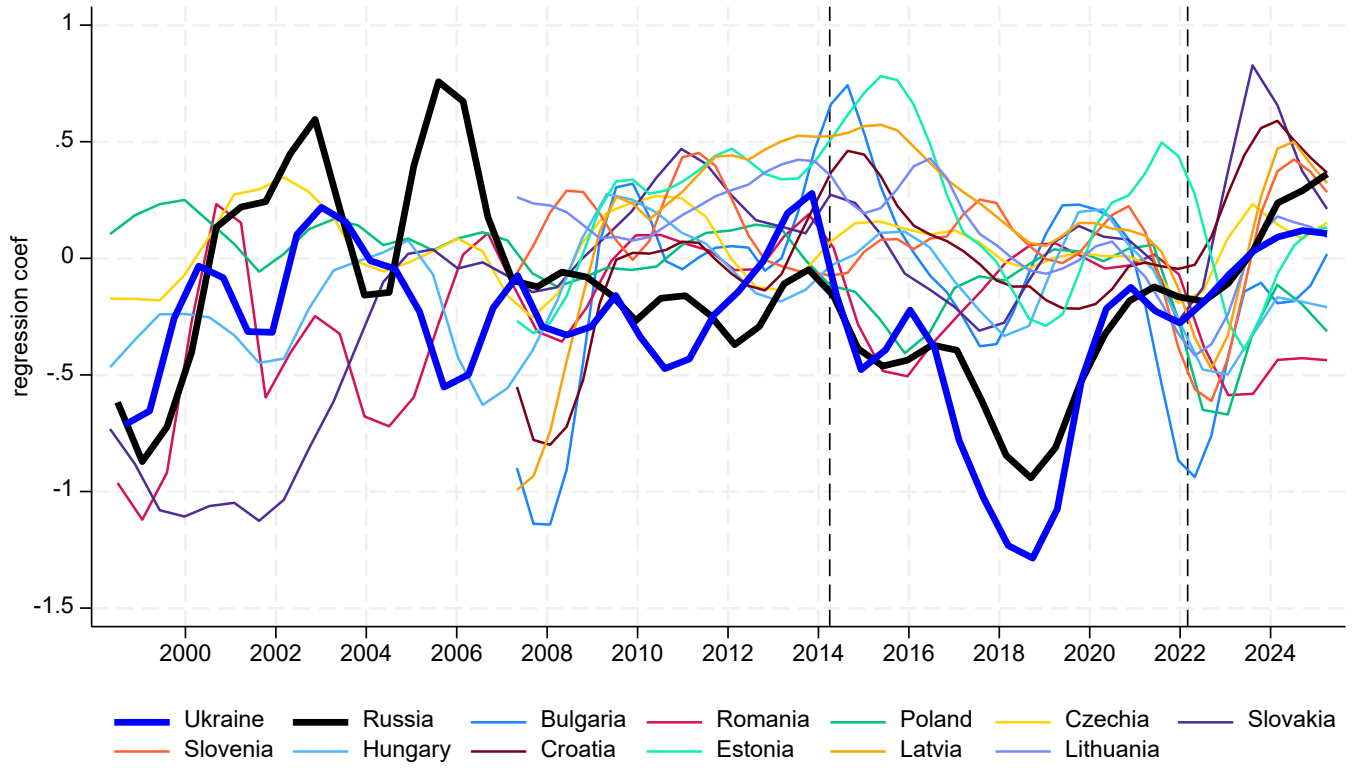


Figure 19. Cost of War and Military Spending vs Distance

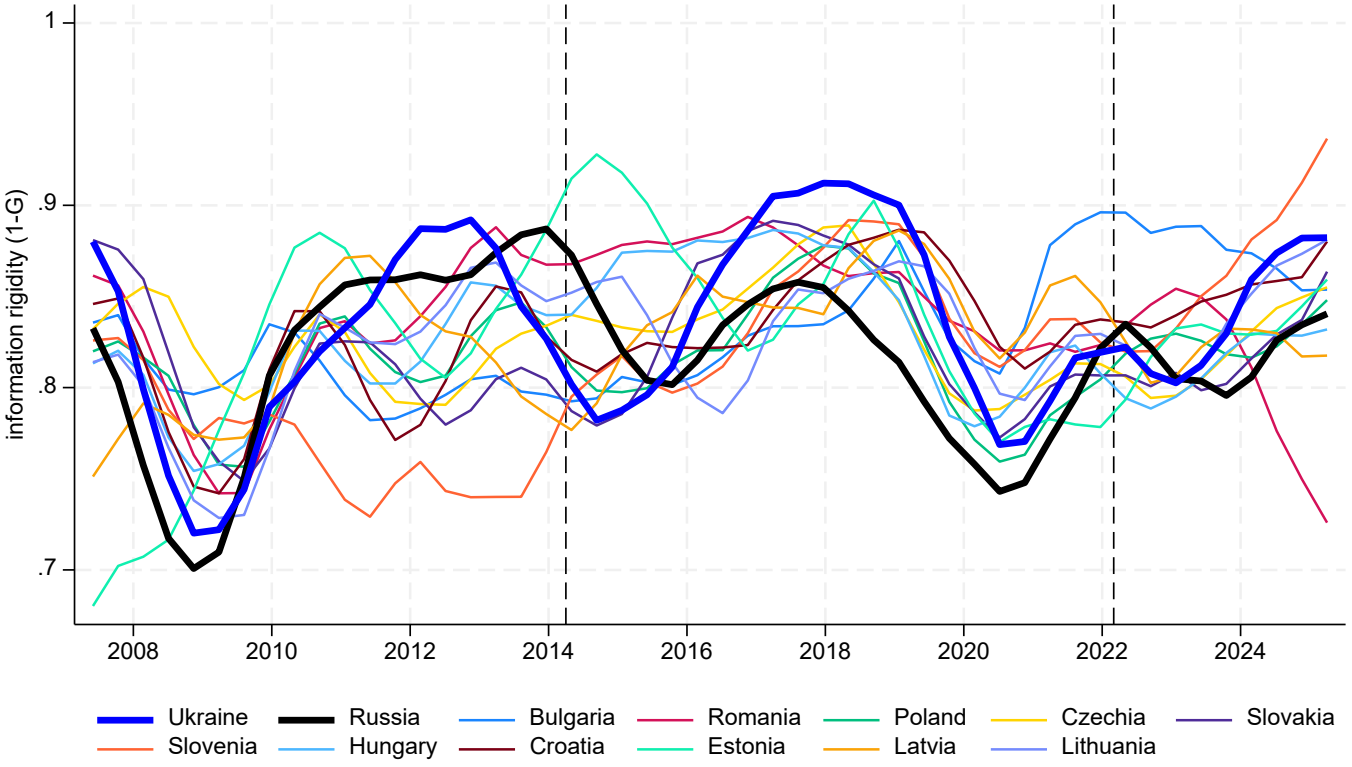


ONLINE APPENDIX

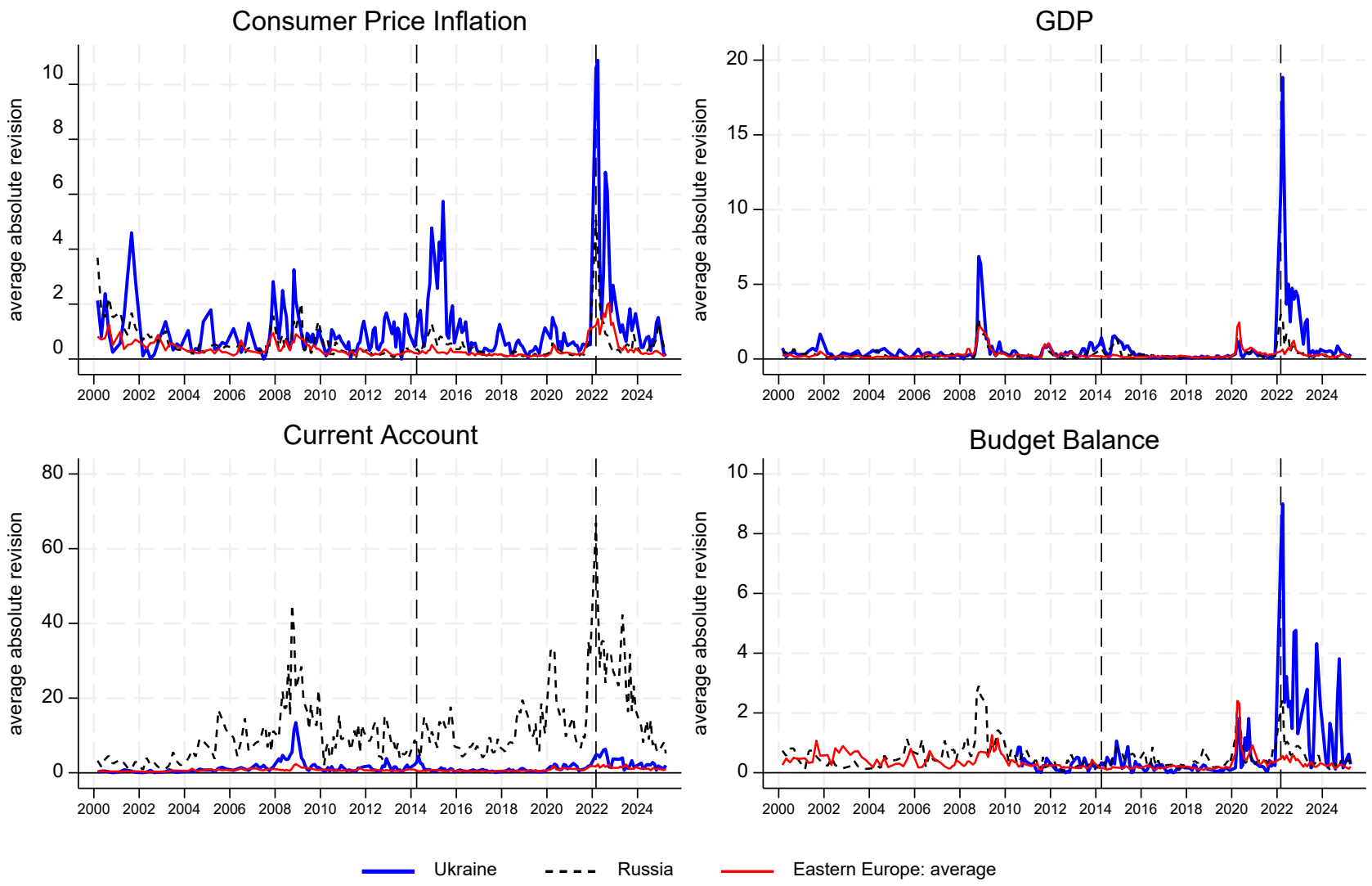
Appendix Figure 1. Sources of business cycles by country.



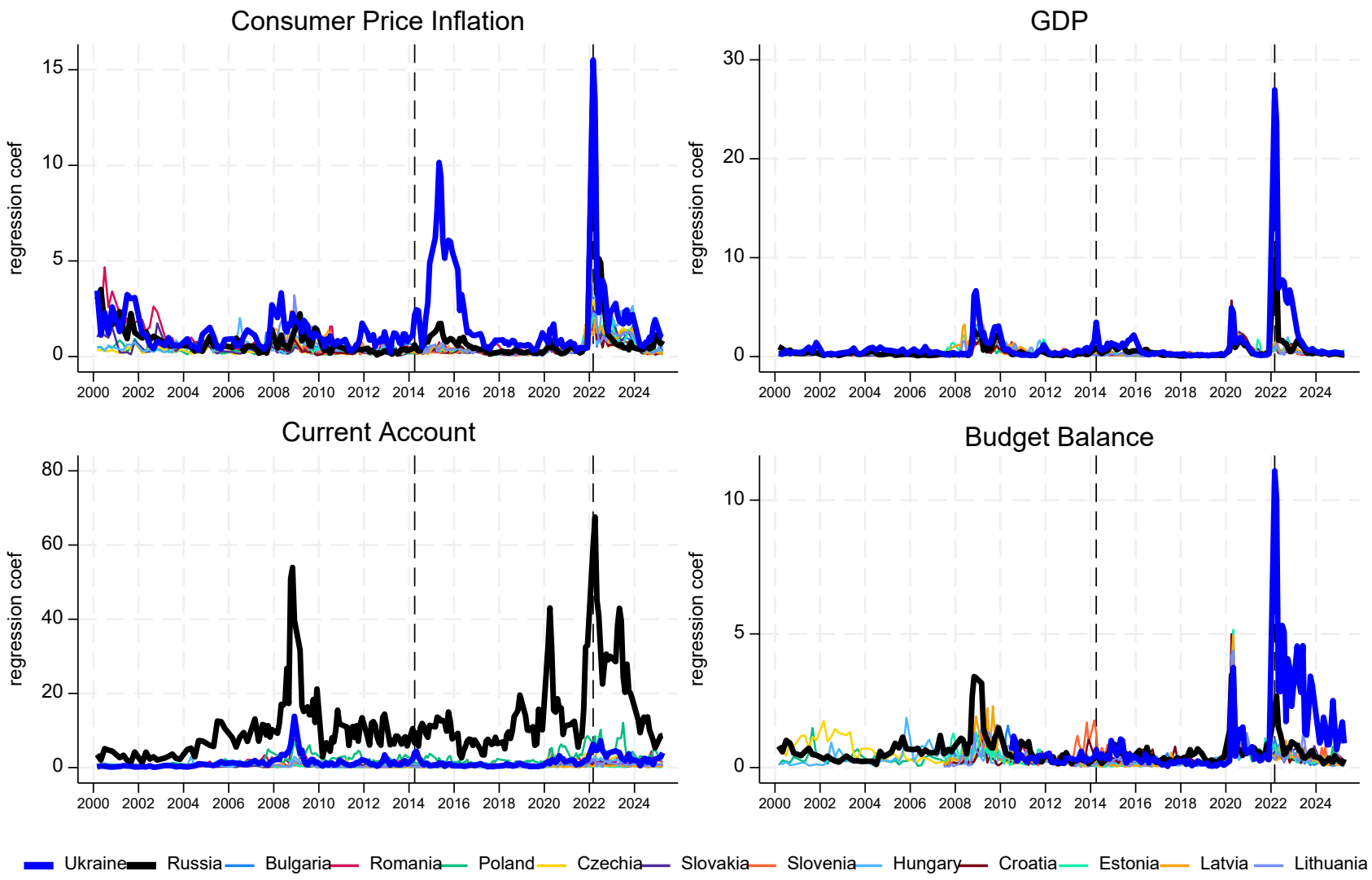
Appendix Figure 2. Information rigidity by country.



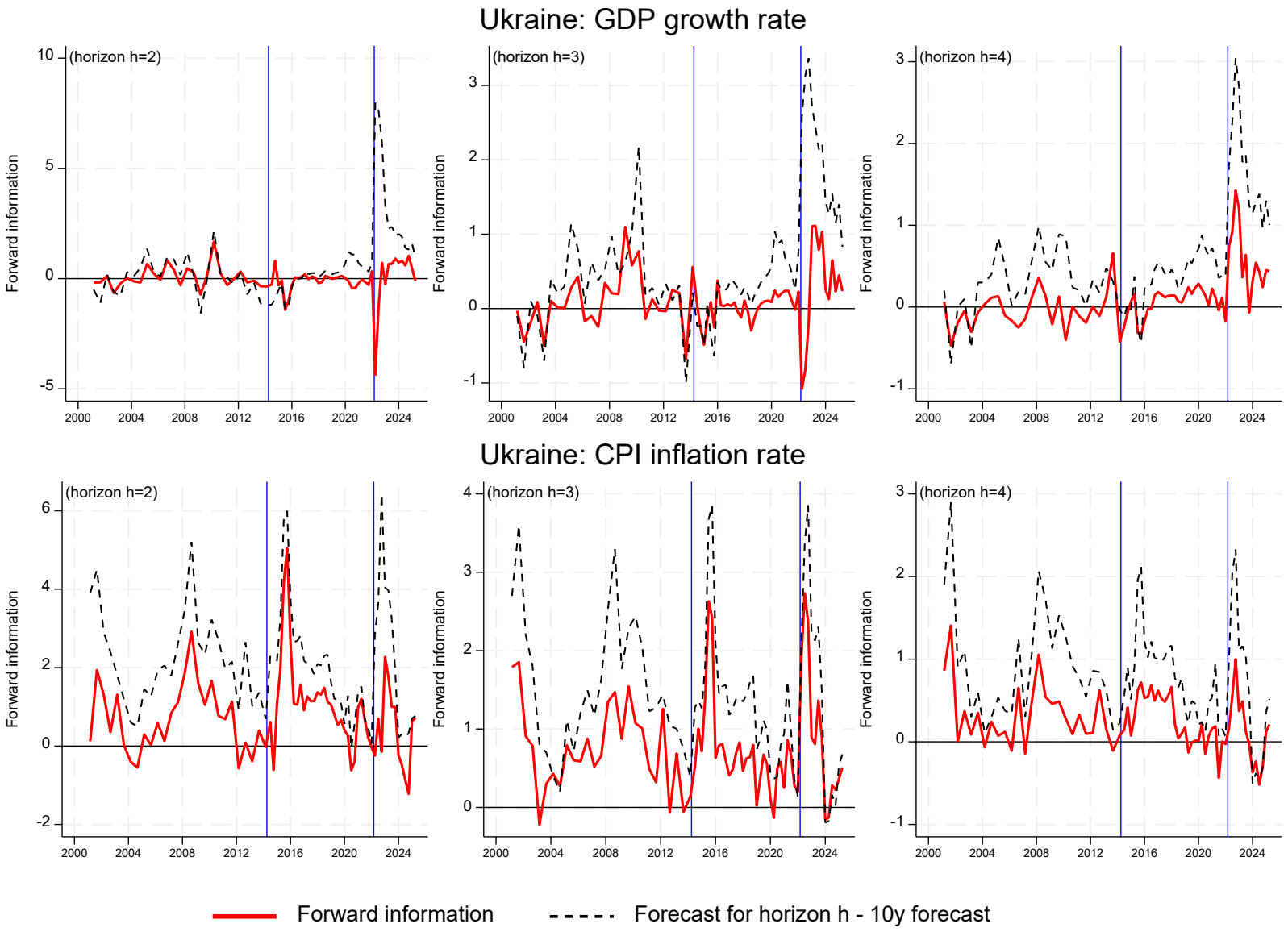
Appendix Figure 3. Mean absolute revision, next calendar year.



Appendix Figure 4. Size of mean absolute revision by country.



Appendix Figure 5. Forward information, AR(2).



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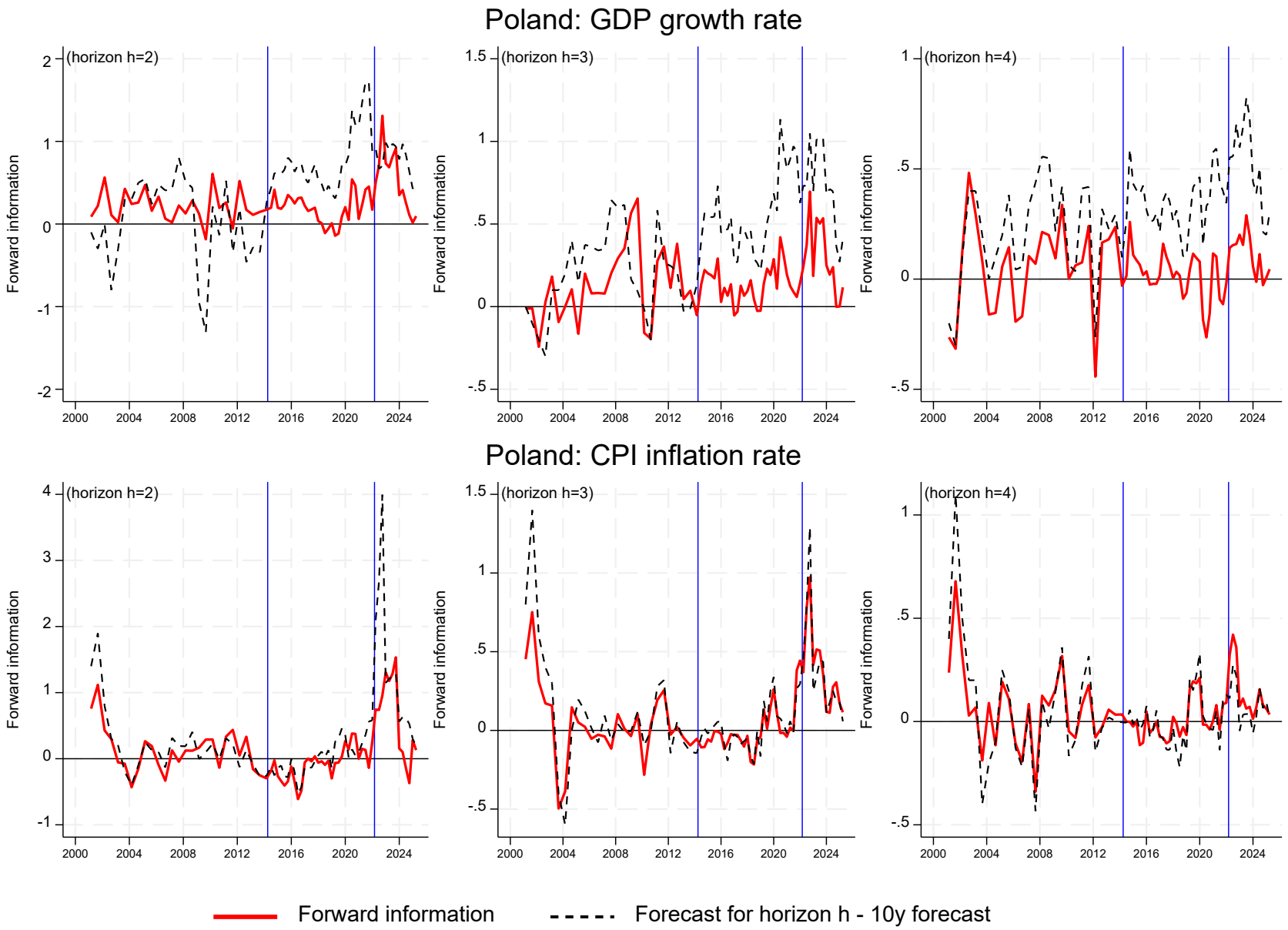
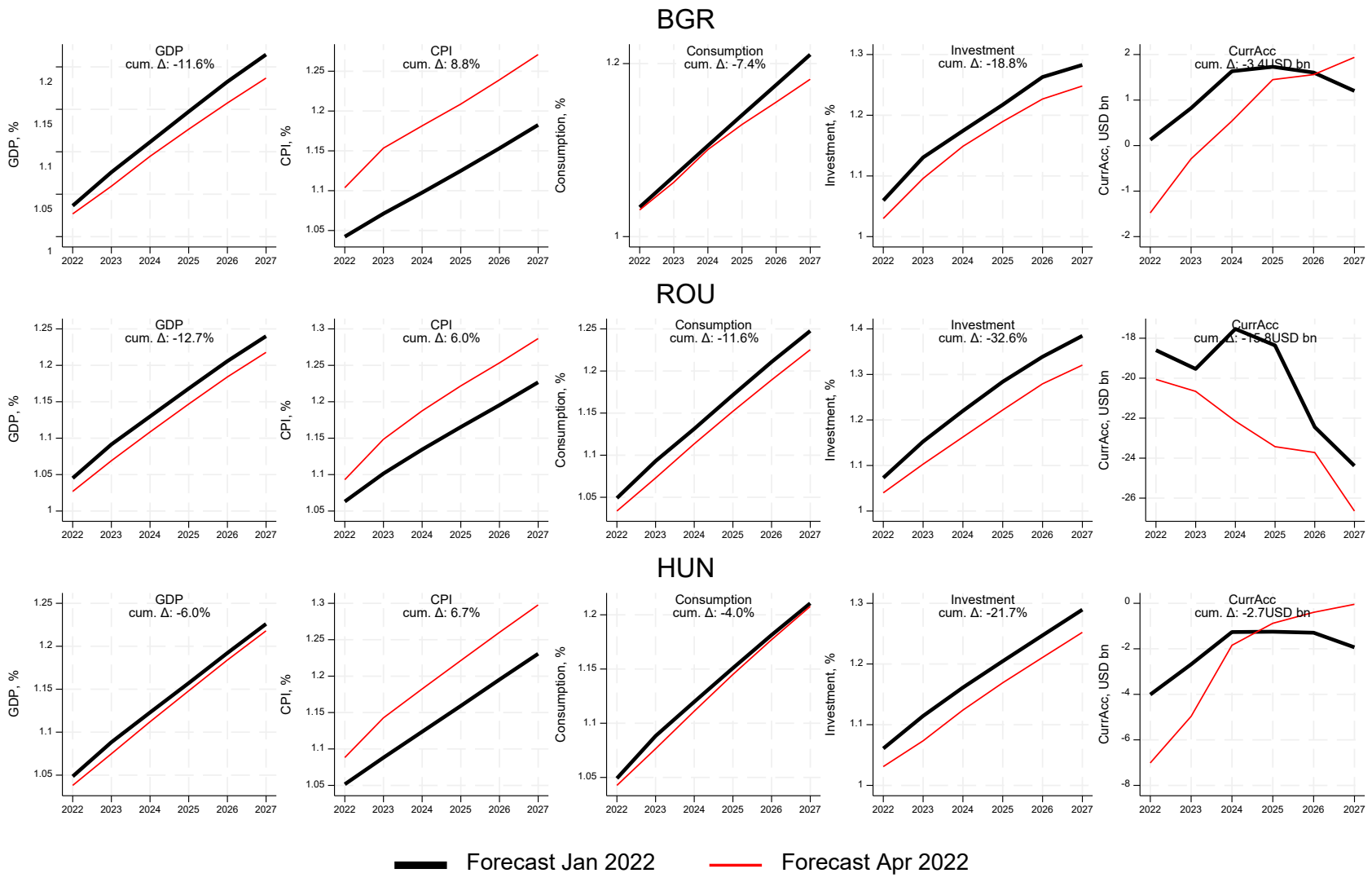

Poland: GDP growth rate
(horizon h=2)
(horizon h=3)
(horizon h=4)
Forward information
Poland: CPI inflation rate
(horizon h=2)
(horizon h=3)
(horizon h=4)
Forward information
Forward information
Forecast for horizon h - 10y forecast

Appendix Figure 6. Event response.



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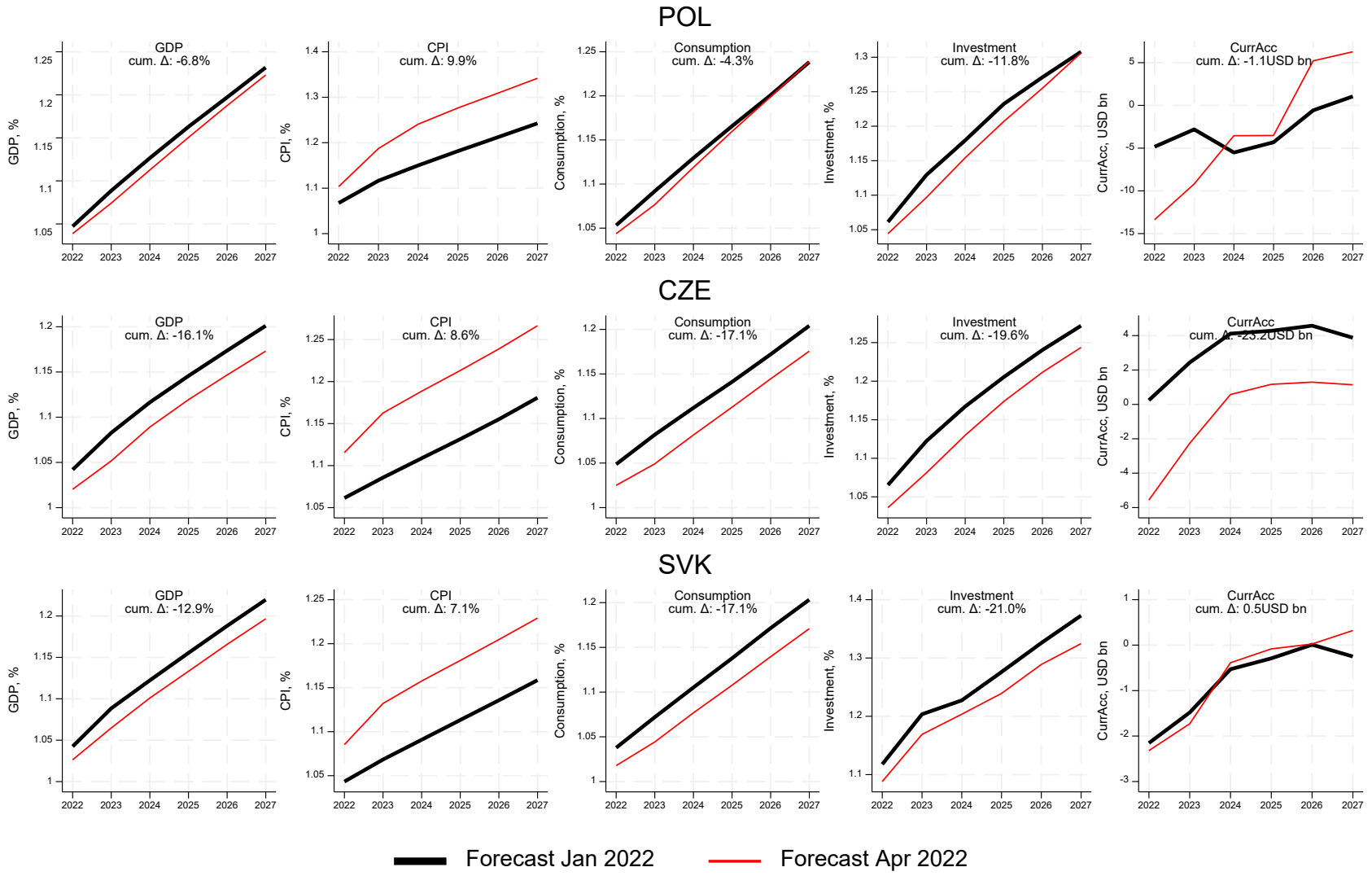

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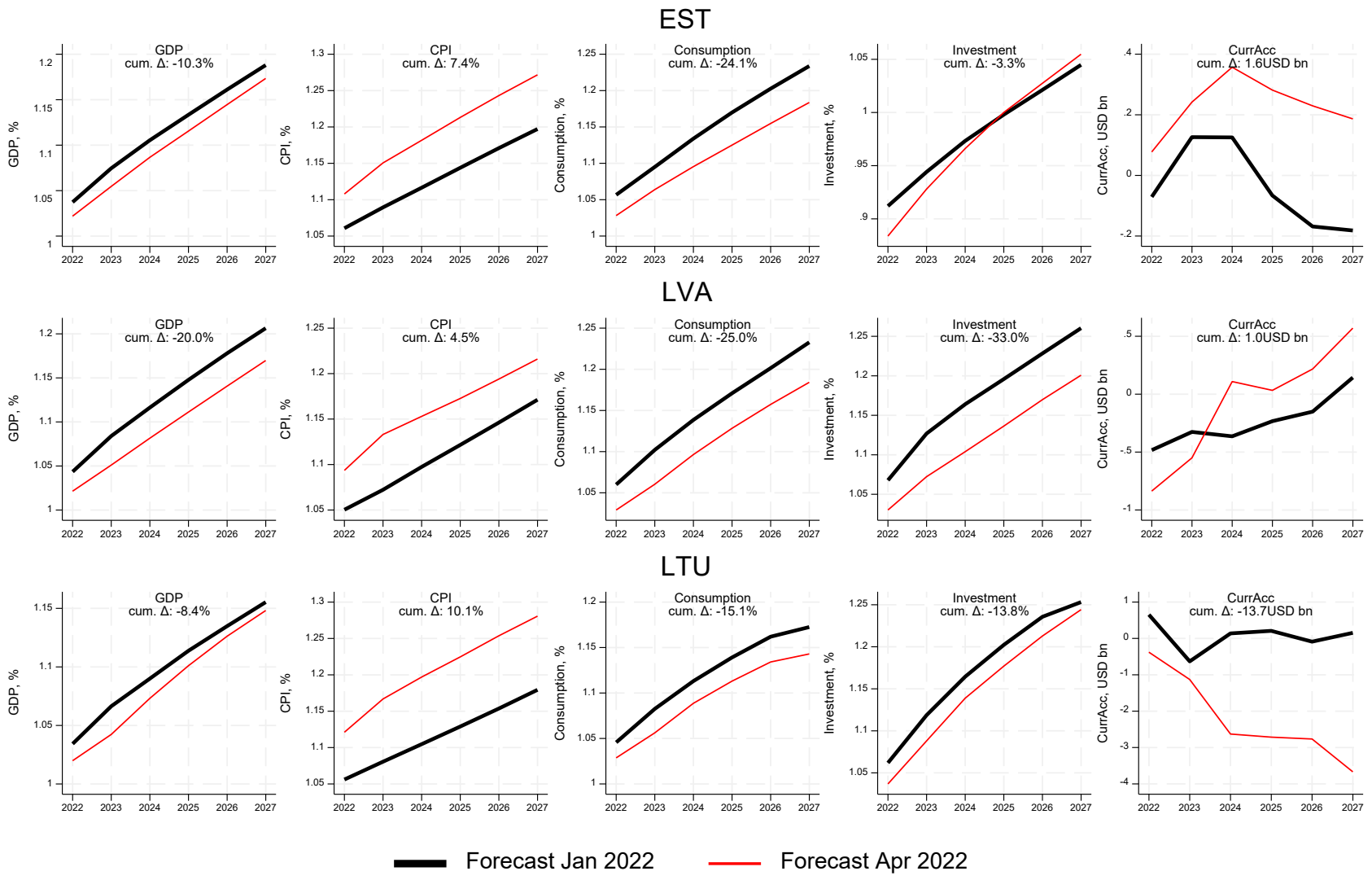

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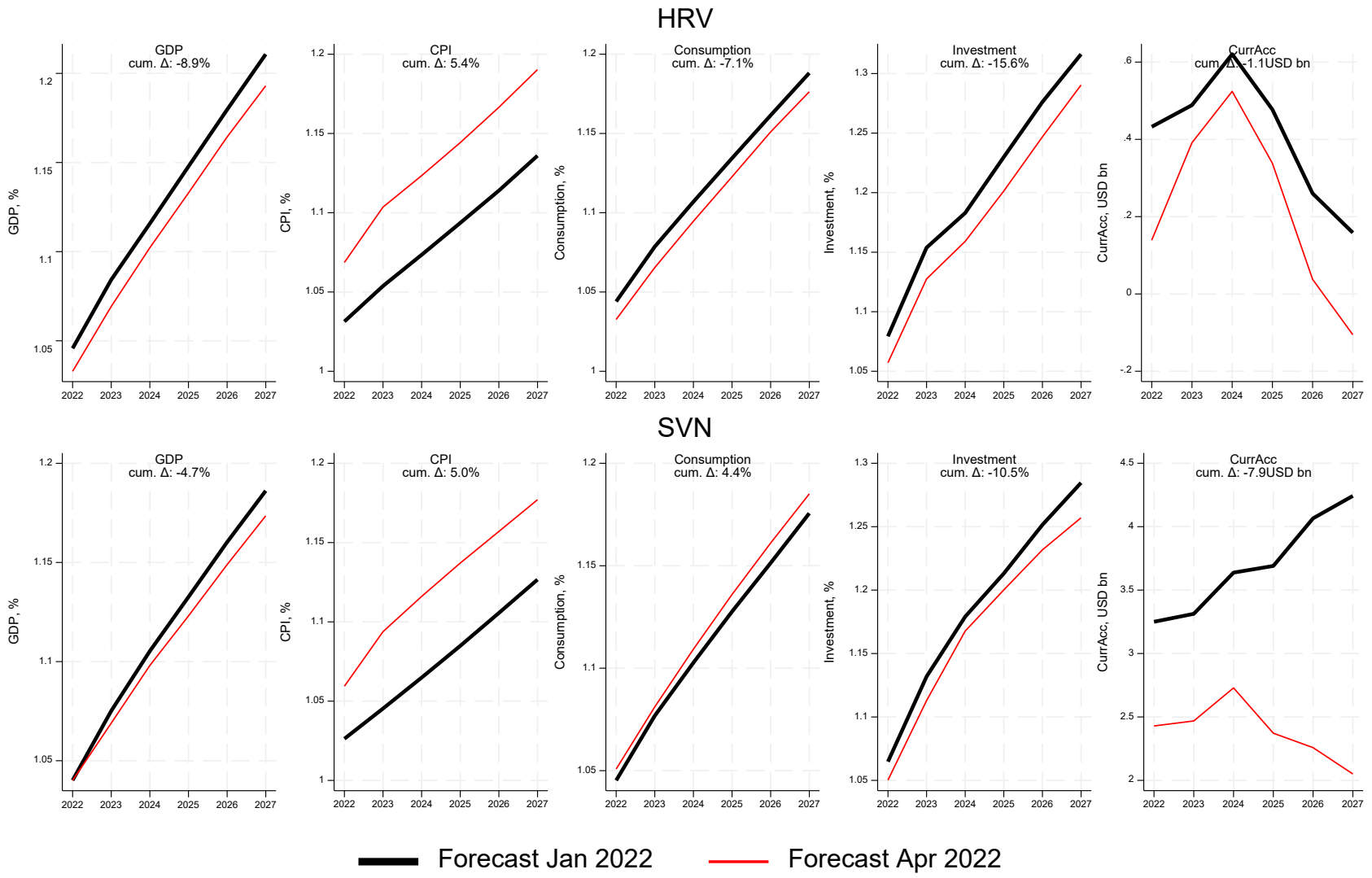
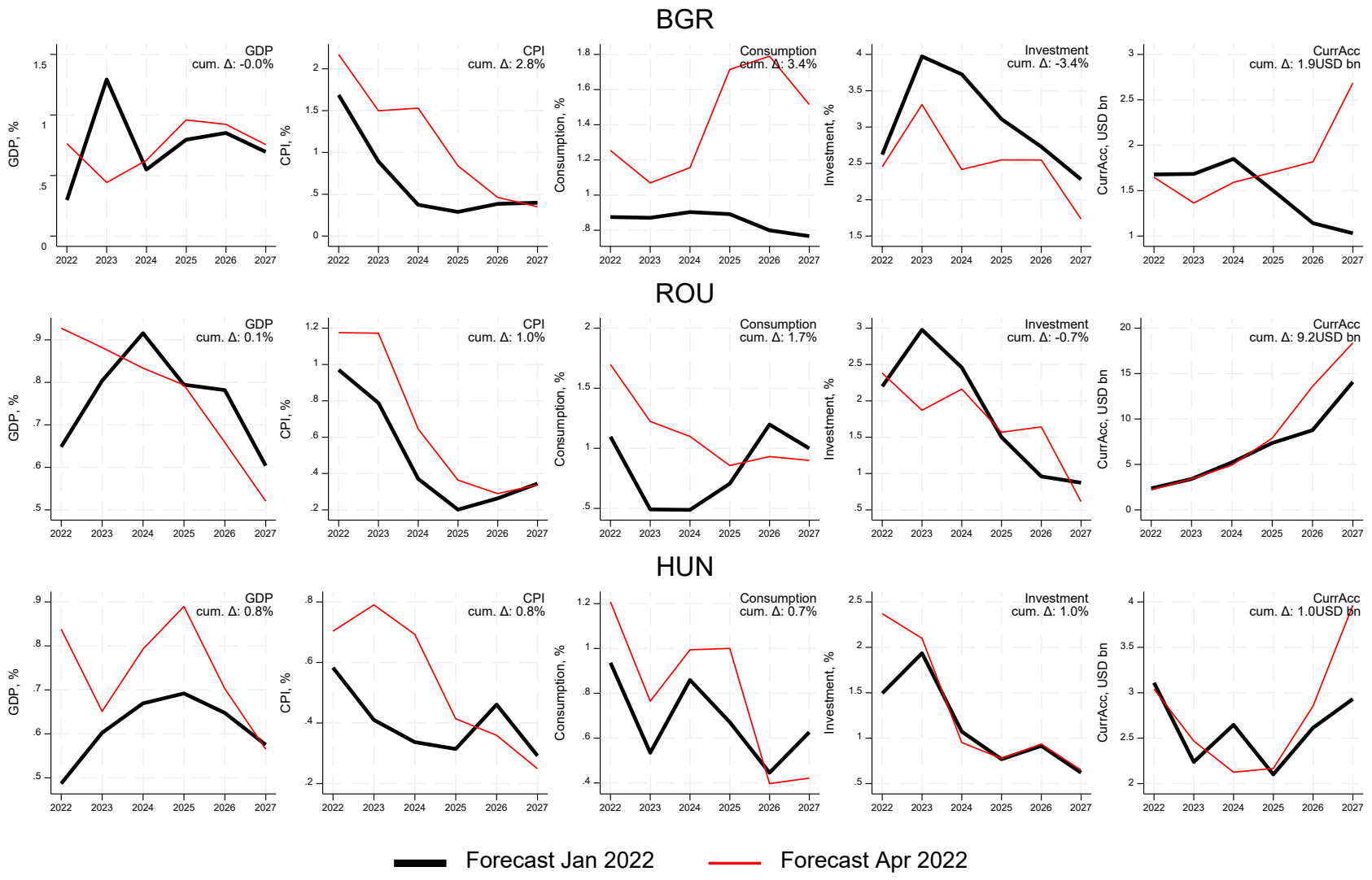

HRV
GDP
cum. Δ: -8.9%
GDP, %
CPI
cum. Δ: 5.4%
CPI, %
Consumption
cum. Δ: -7.1%
Consumption, %
Investment
cum. Δ: -15.6%
Investment, %
CurrAcc
cum. Δ: -1.1USD bn
CurrAcc, USD bn
SVN
GDP
cum. Δ: -4.7%
GDP, %
CPI
cum. Δ: 5.0%
CPI, %
Consumption
cum. Δ: 4.4%
Consumption, %
Investment
cum. Δ: -10.5%
Investment, %
CurrAcc
cum. Δ: -7.9USD bn
CurrAcc, USD bn
2022
2023
2024
2025
2026
2027
Forecast Jan 2022
Forecast Apr 2022

Appendix Figure 7. Event response: disagreement.



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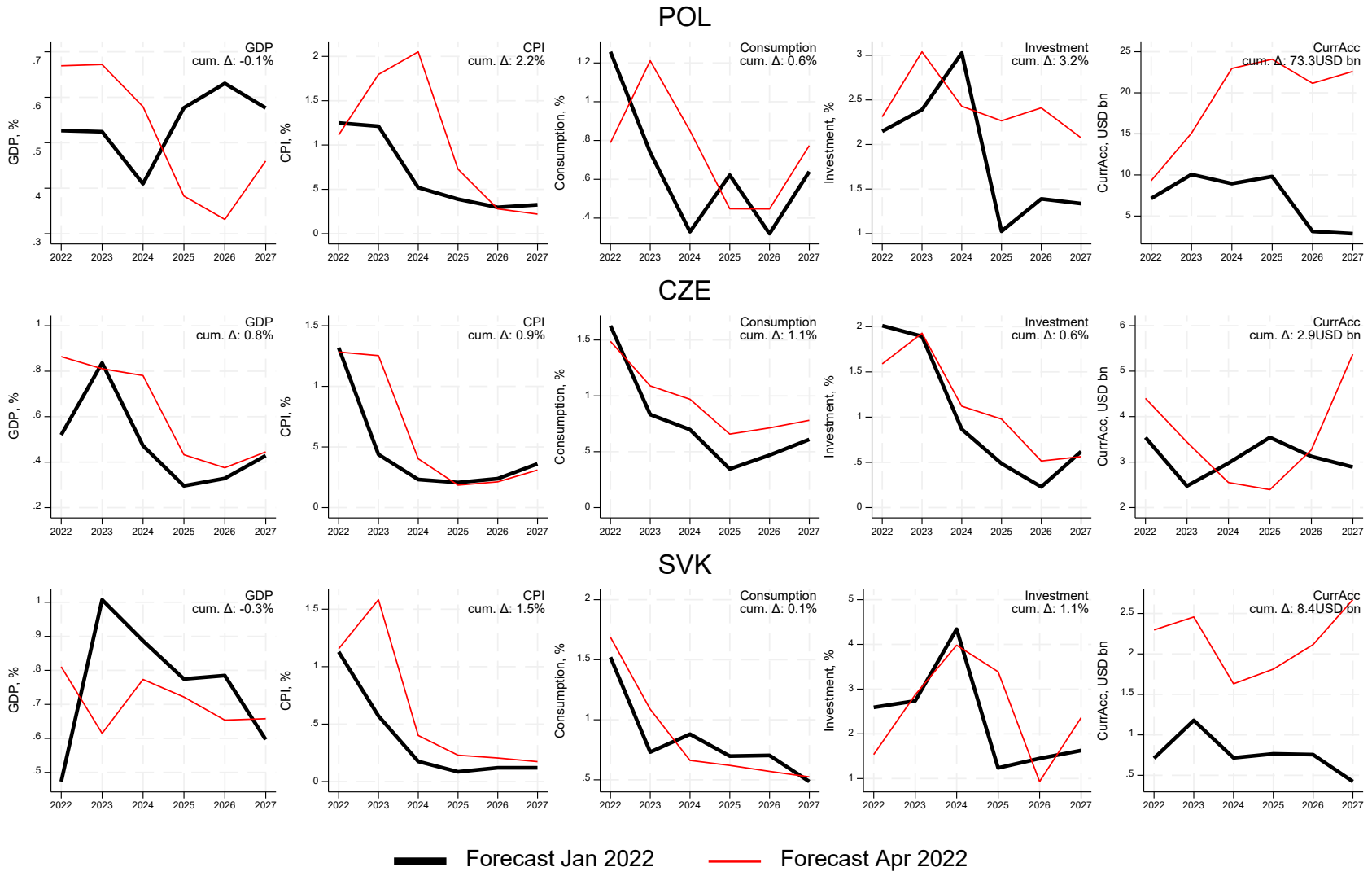

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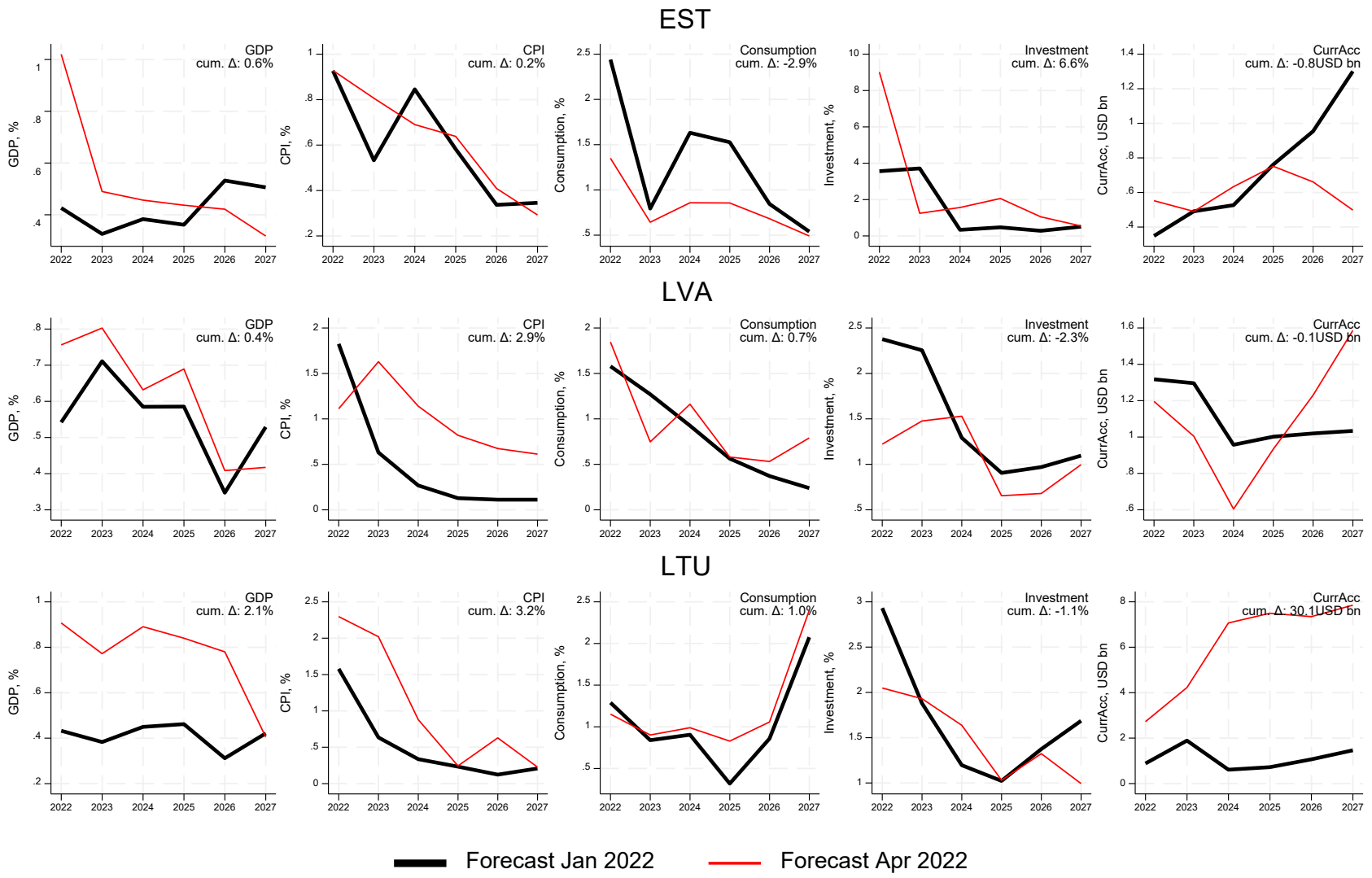

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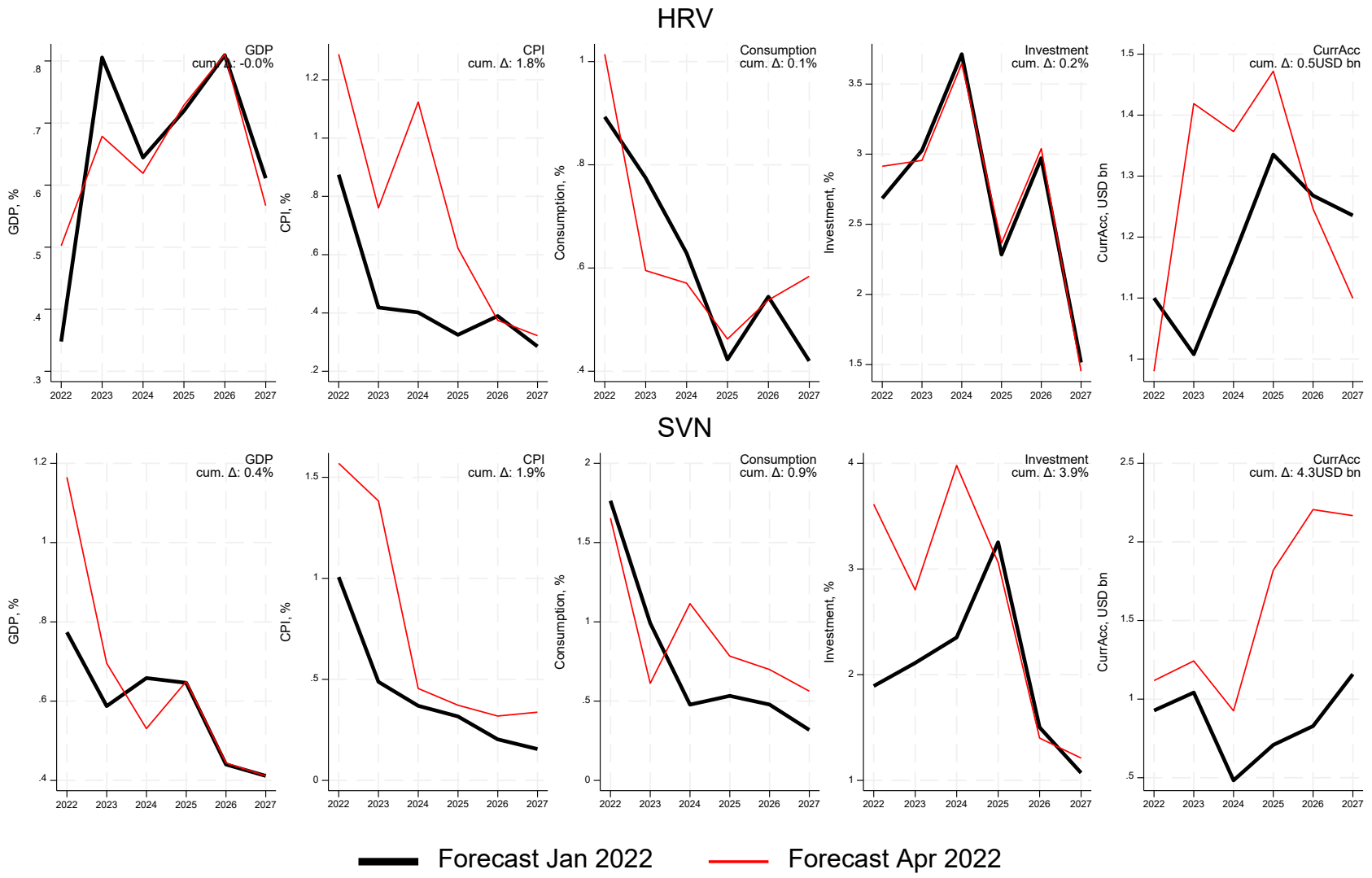
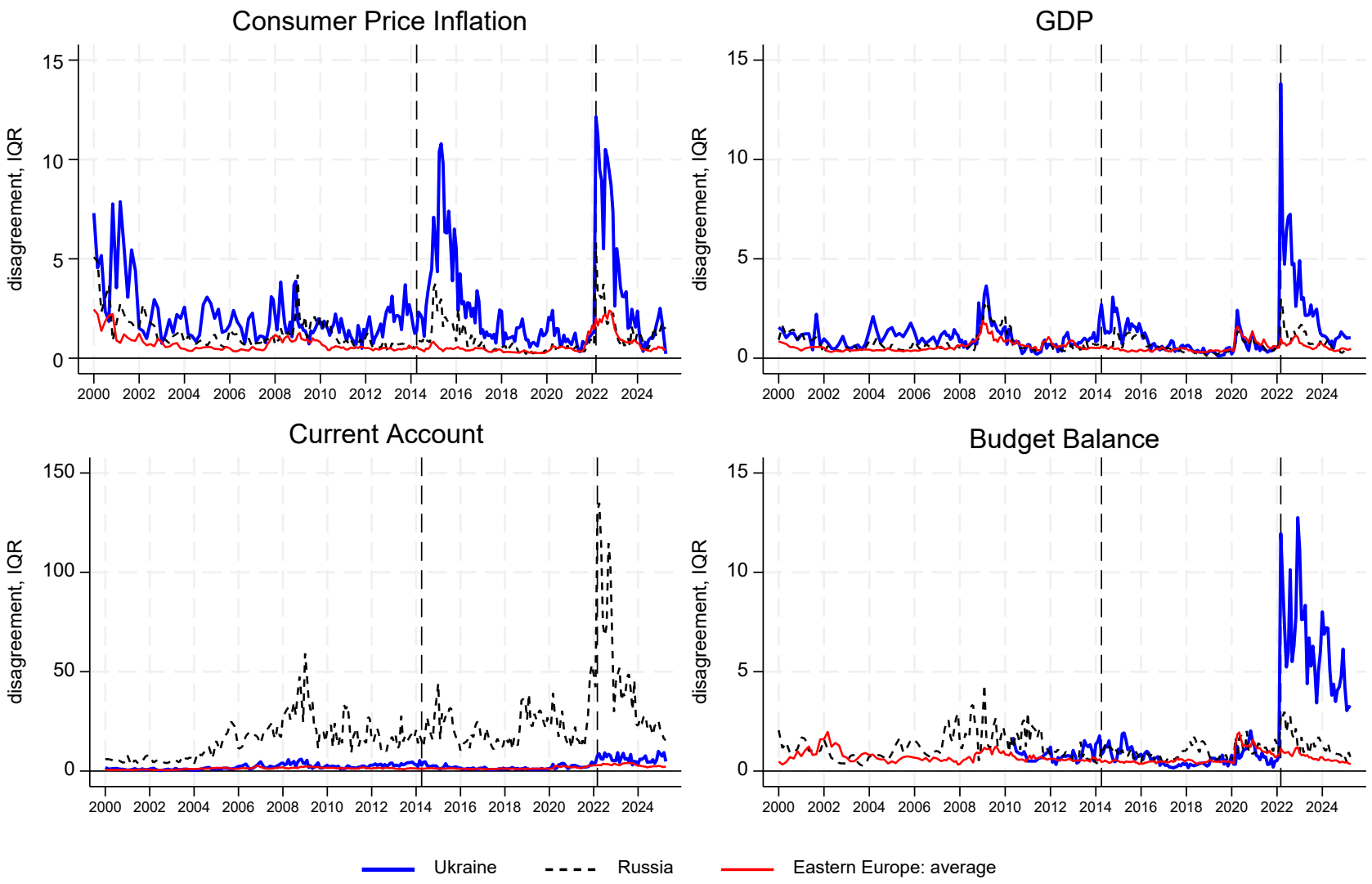
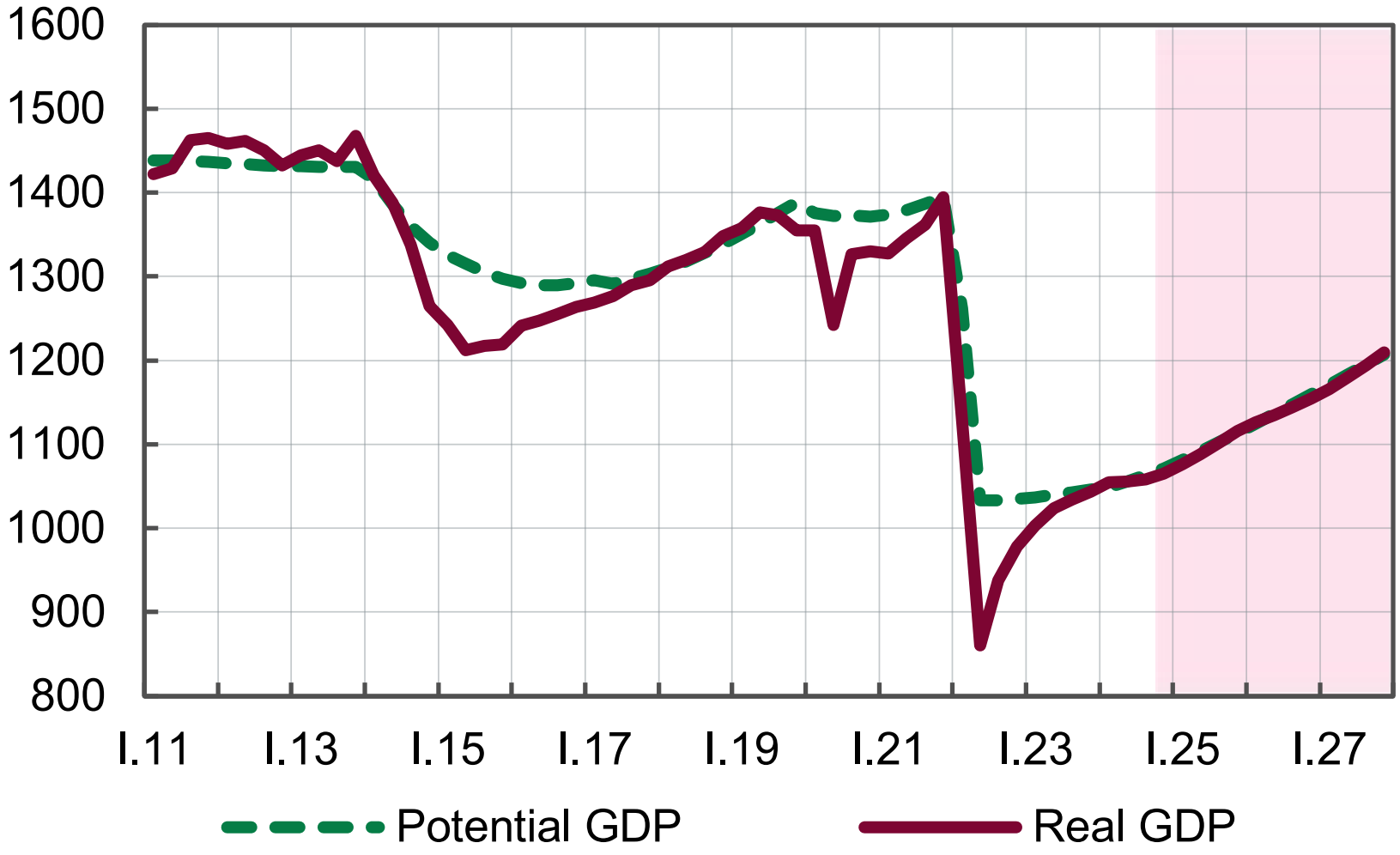

HRV
GDP
cum. Δ: -0.0%
CPI
cum. Δ: 1.8%
Consumption
cum. Δ: 0.1%
Investment
cum. Δ: 0.2%
CurrAcc
cum. Δ: 0.5USD bn
GDP, %
CPI, %
Consumption, %
Investment, %
CurrAcc, USD bn
SVN
GDP
cum. Δ: 0.4%
CPI
cum. Δ: 1.9%
Consumption
cum. Δ: 0.9%
Investment
cum. Δ: 3.9%
CurrAcc
cum. Δ: 4.3USD bn
Forecast Jan 2022
Forecast Apr 2022

Appendix Figure 8. Disagreement (standard deviation of forecasts).

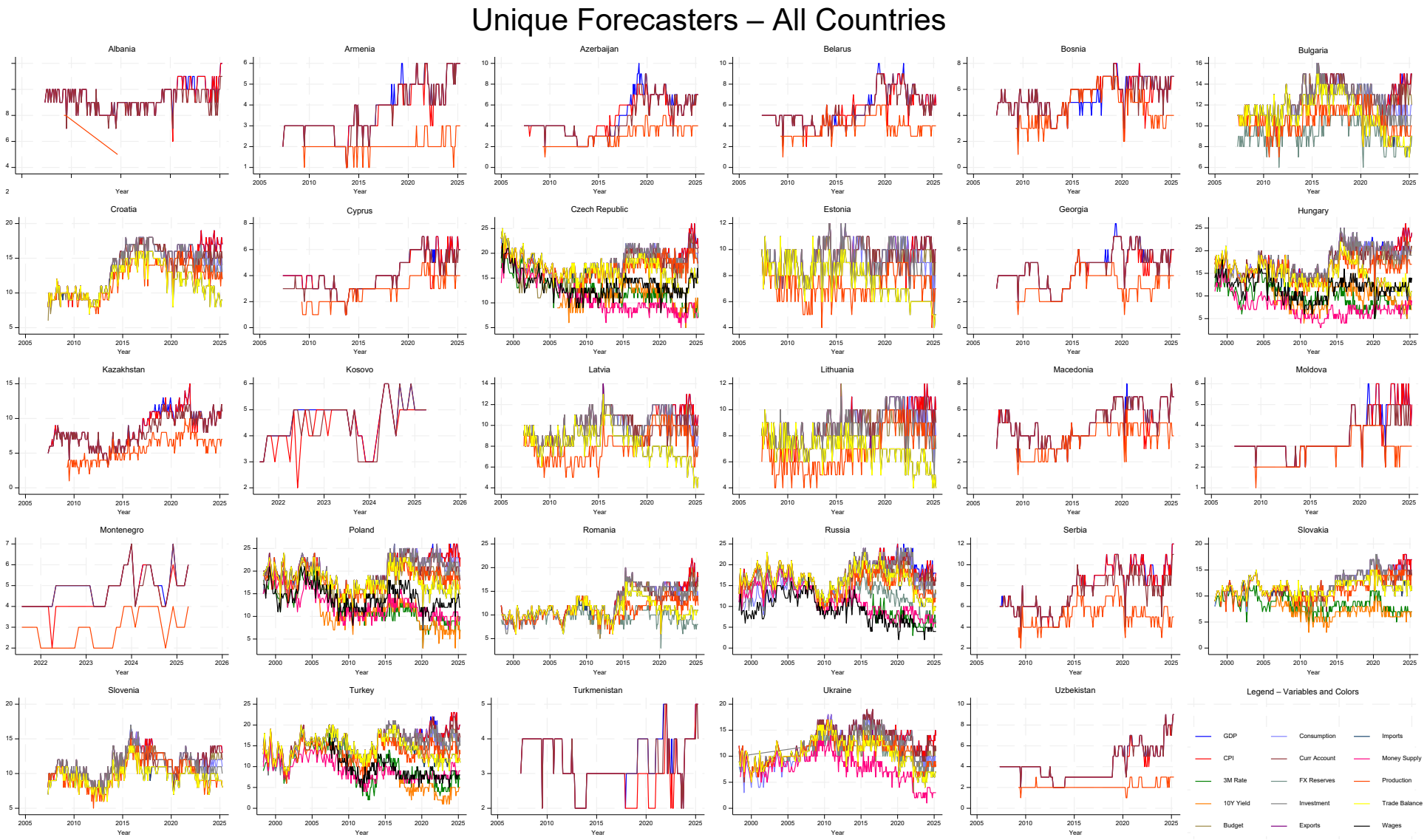


Appendix Figure 9. Actual and potential output in Ukraine.

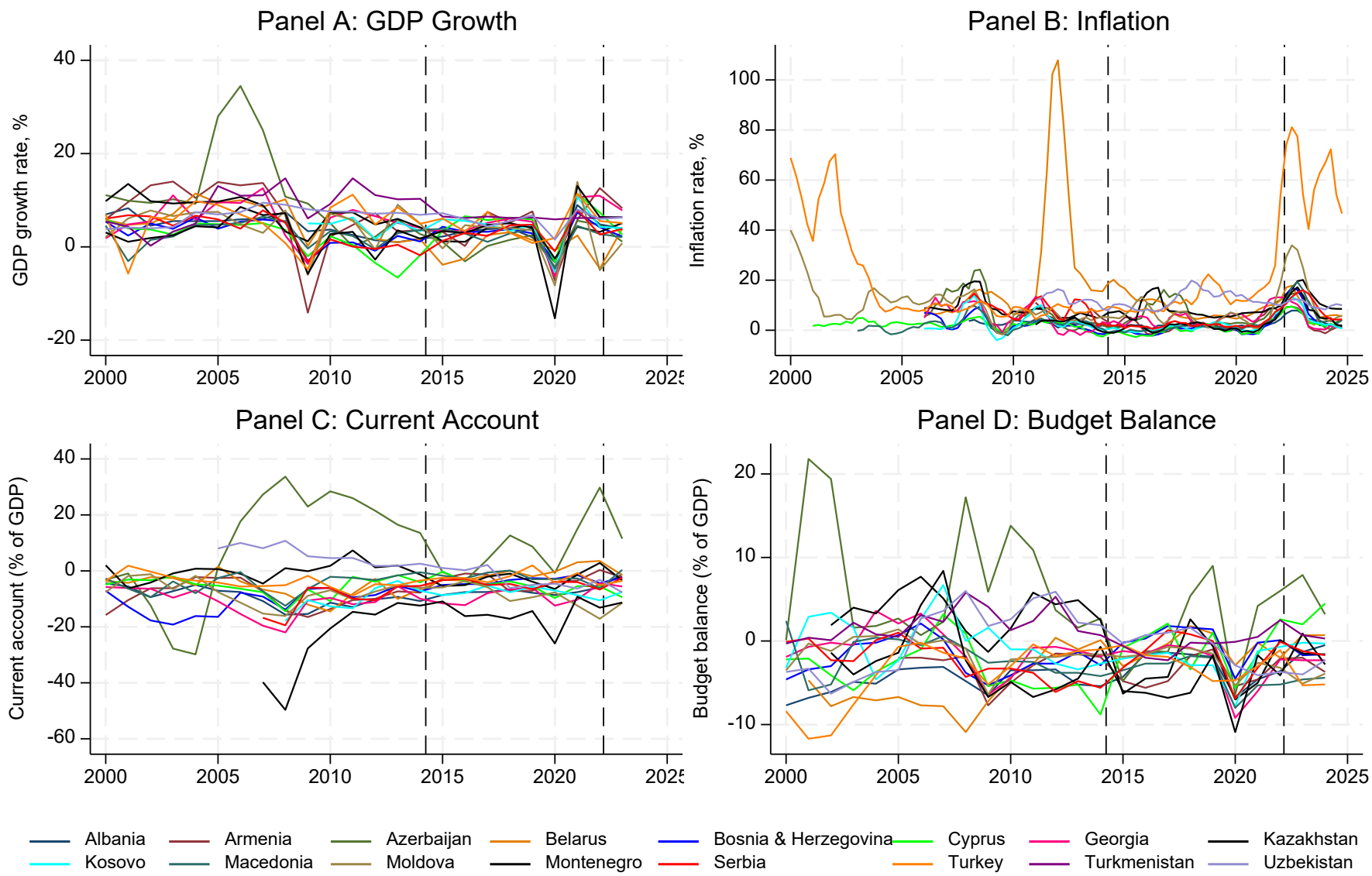


Notes: 2021 constant prices (UAH billions). Source: National Bank of Ukraine.

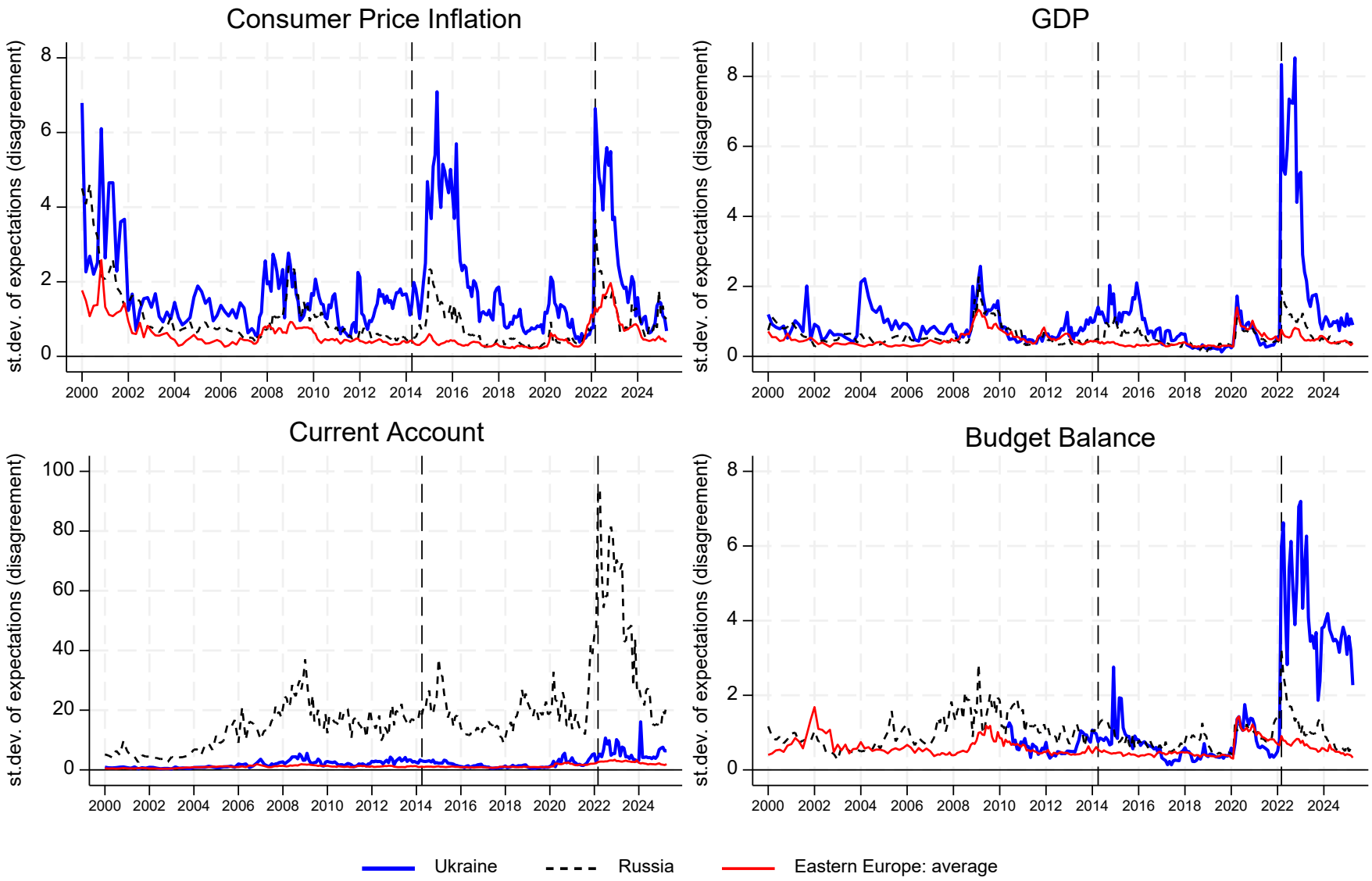
Appendix Figure 10. Individual Forecaster Count Over Time.



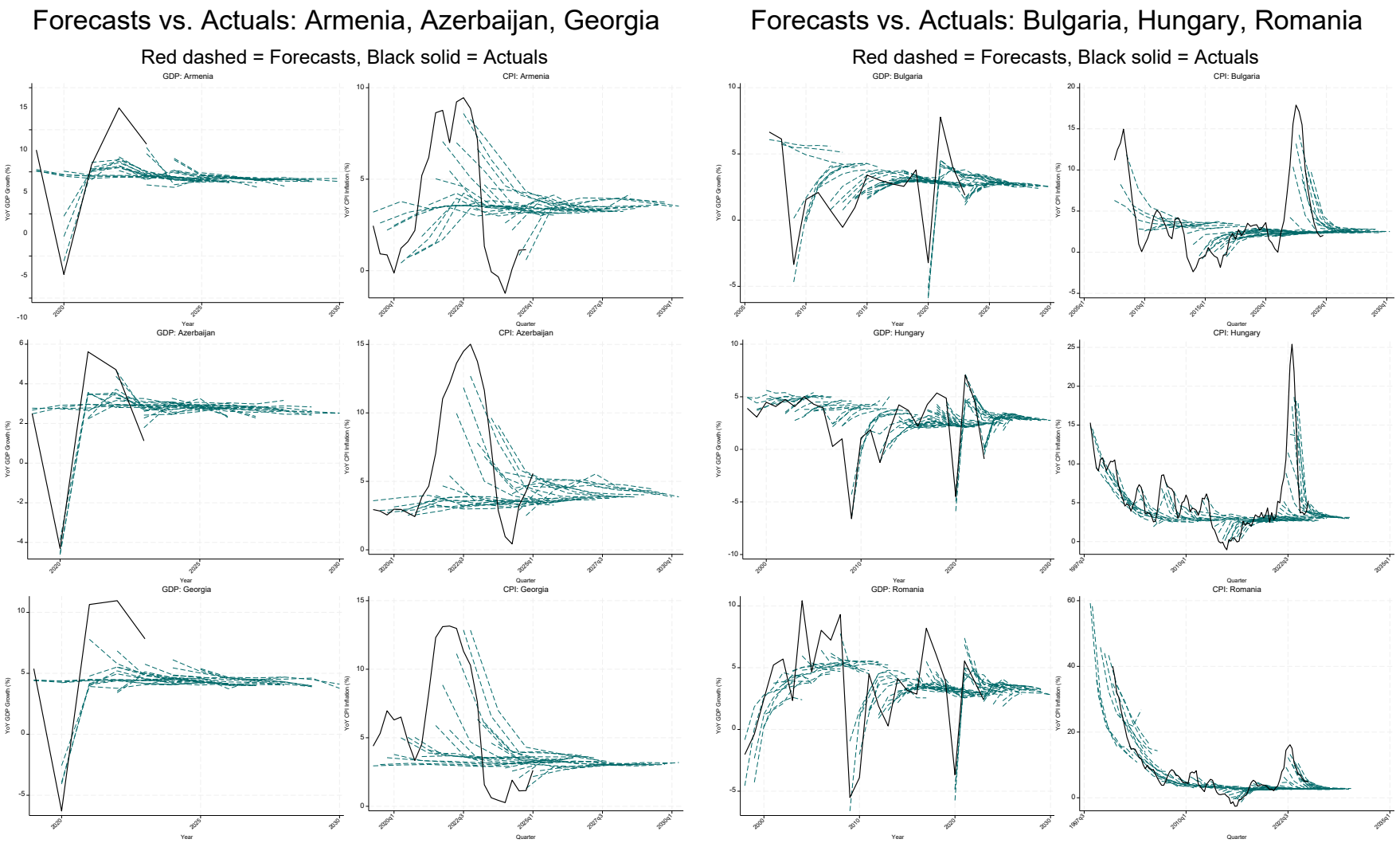
Appendix Figure 11. Macroeconomic trends: additional countries.



Appendix Figure 12. Disagreement (standard deviation of forecasts).



Appendix Figure 13. Forecasts vs. realized macroeconomic data: additional countries.



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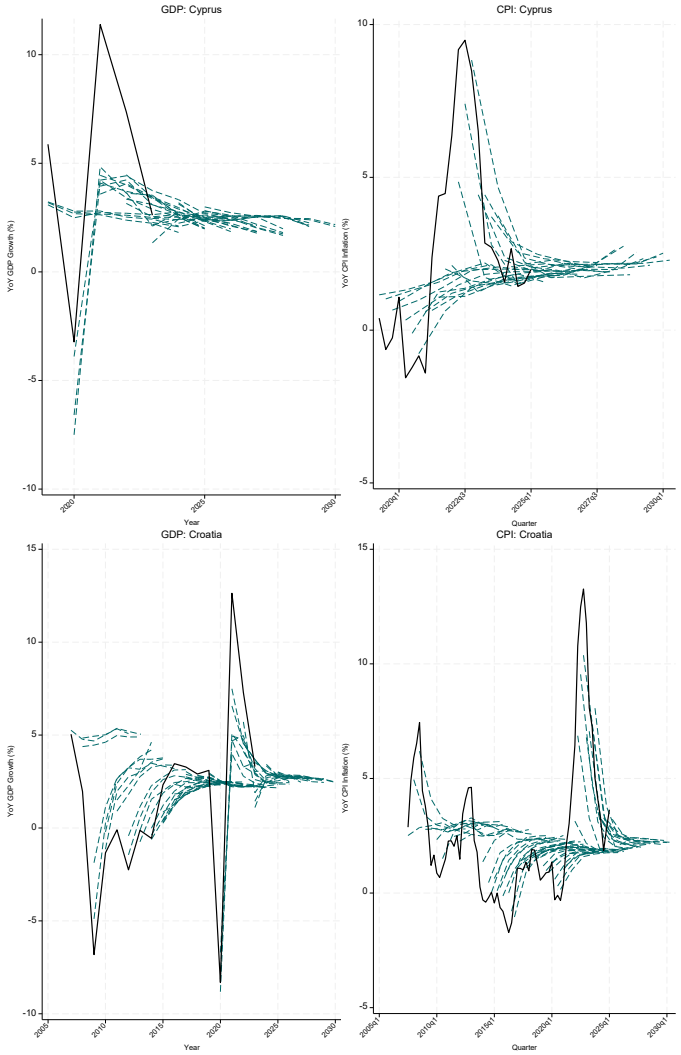
Forecasts vs. Actuals: Cyprus, Croatia

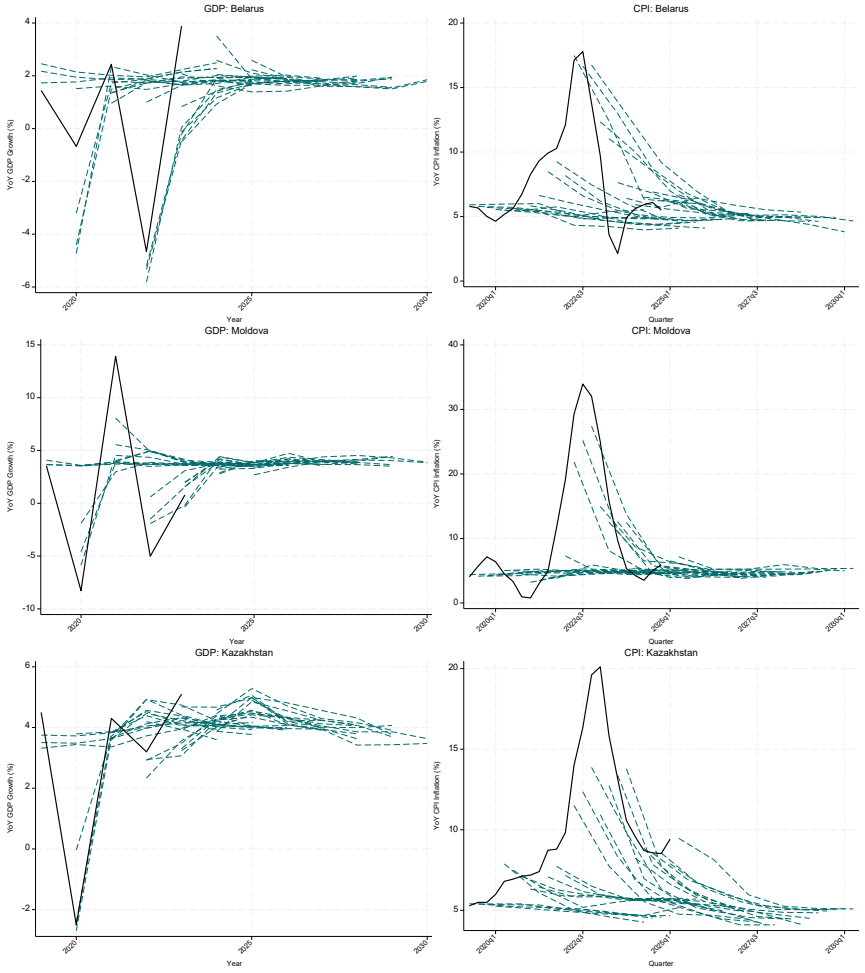
Red dashed = Forecasts, Black solid = Actuals



Note: CPI = quarterly, GDP = annual

Forecasts vs. Actuals: Belarus, Moldova, Kazakhstan

Red dashed = Forecasts, Black solid = Actuals



Note: CPI = quarterly, GDP = annual

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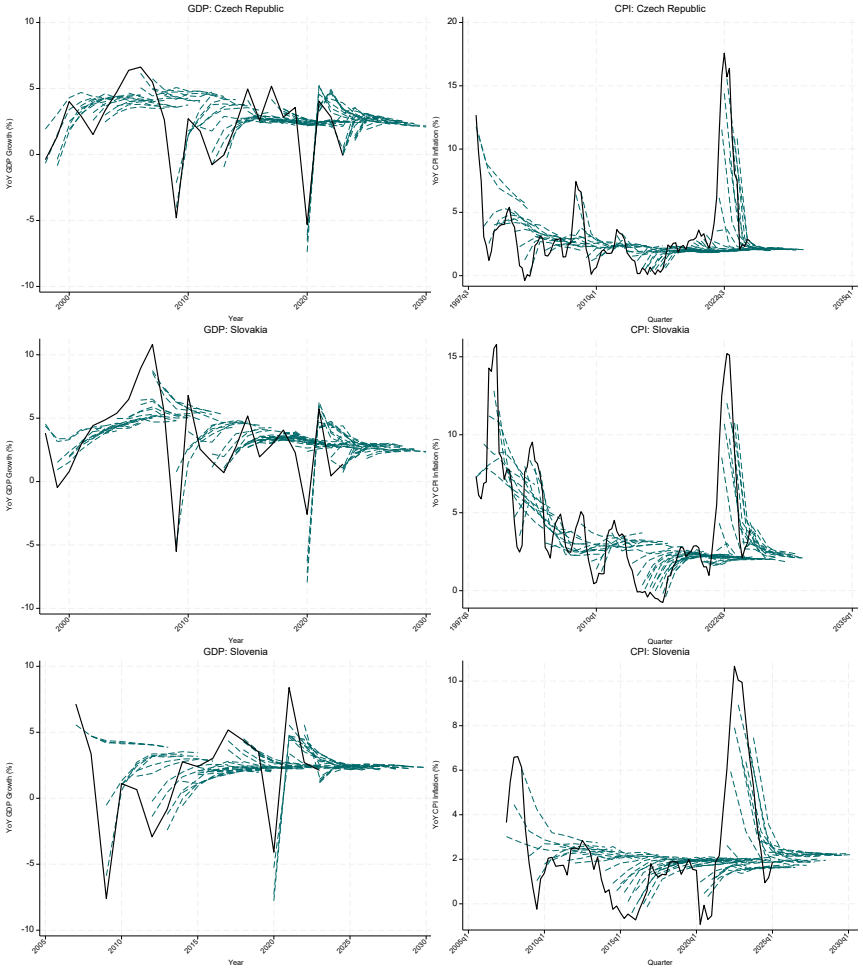
Forecasts vs. Actuals: Czech Republic, Slovakia, Slovenia

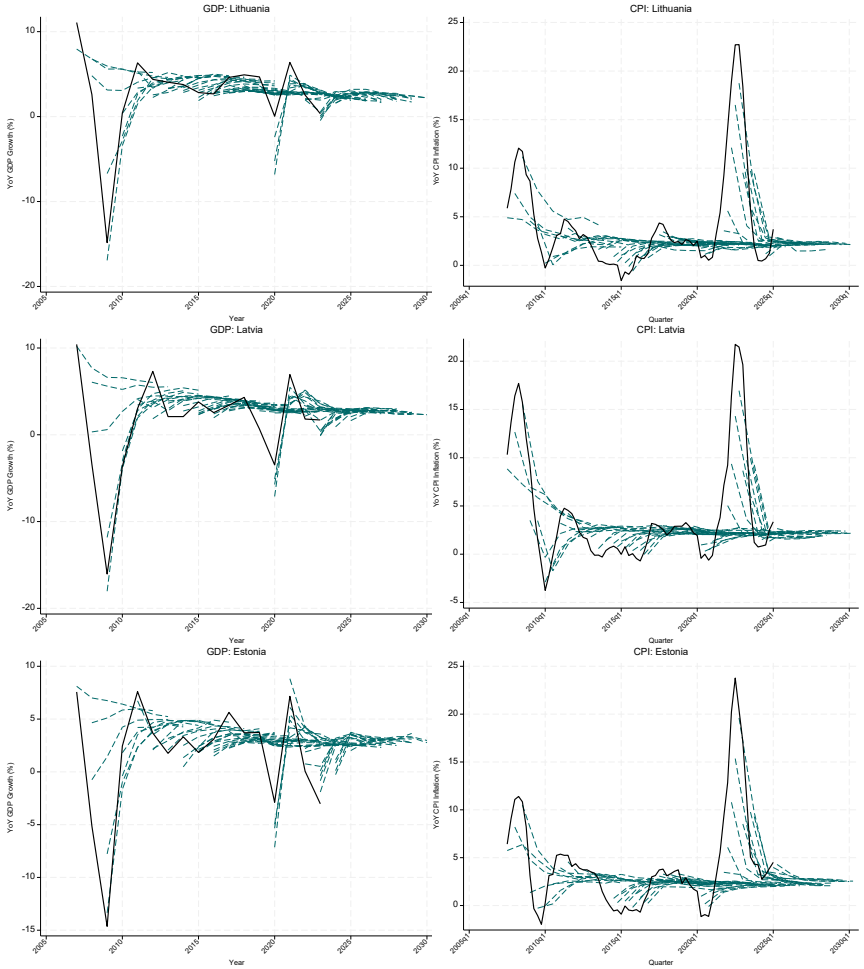
Red dashed = Forecasts, Black solid = Actuals



Note: CPI = quarterly, GDP = annual

Forecasts vs. Actuals: Lithuania, Latvia, Estonia

Red dashed = Forecasts, Black solid = Actuals



Note: CPI = quarterly, GDP = annual

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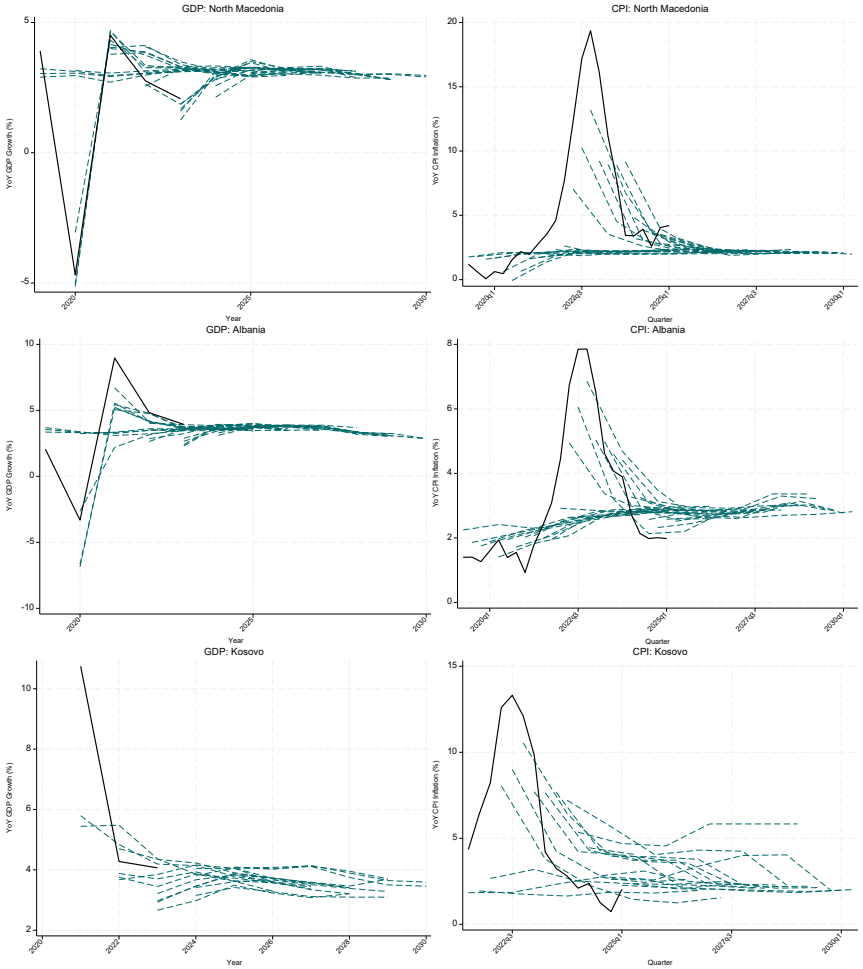
Forecasts vs. Actuals: North Macedonia, Albania, Kosovo

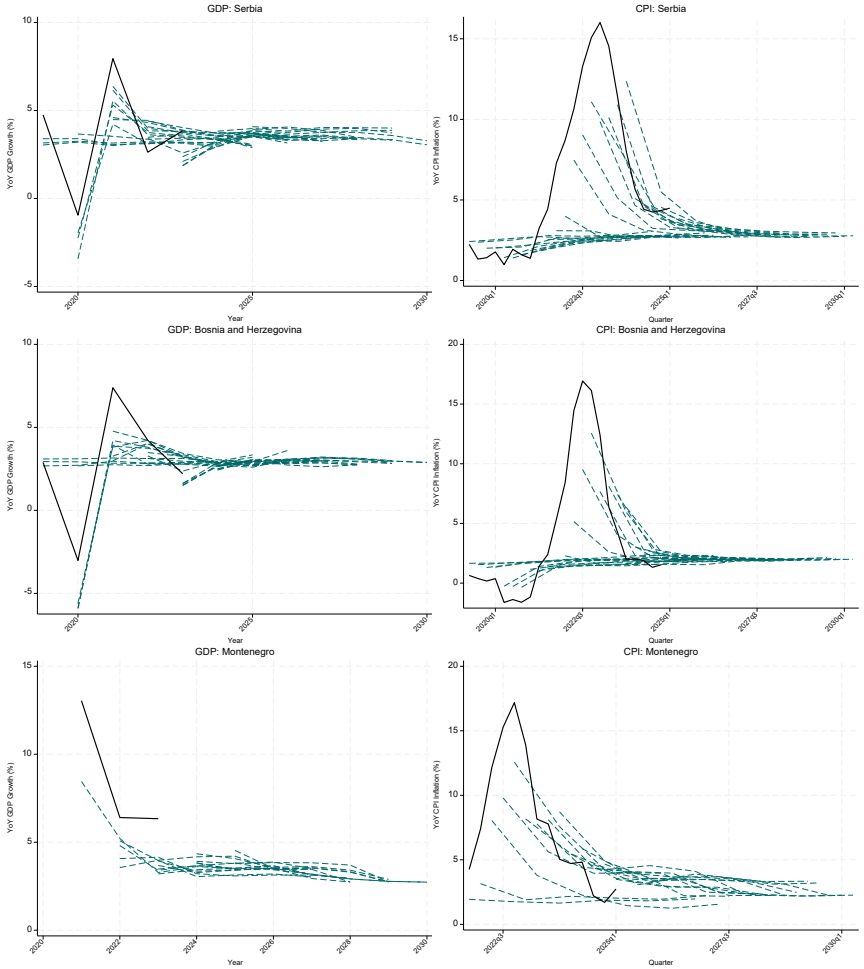
Red dashed = Forecasts, Black solid = Actuals



Note: CPI = quarterly, GDP = annual

Forecasts vs. Actuals: Serbia, Bosnia and Herzegovina, Monten

Red dashed = Forecasts, Black solid = Actuals



Note: CPI = quarterly, GDP = annual

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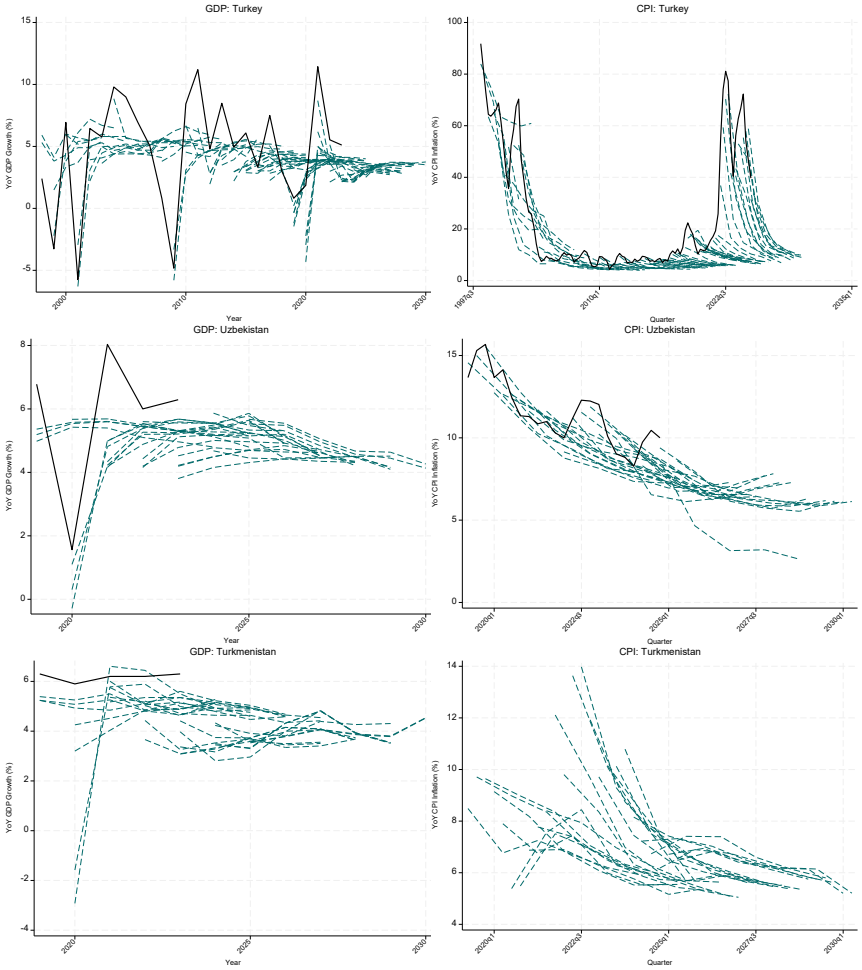
Forecasts vs. Actuals: Turkey, Uzbekistan, Turkmenistan

Red dashed = Forecasts, Black solid = Actuals



Note: CPI = quarterly, GDP = annual

Appendix Table 1. Start dates for Short- and Long-Term forecasts

Country	Long-term forecast	Short-term forecast
Albania	April 2019	May 2007
Armenia	April 2019	May 2007
Azerbaijan	April 2019	May 2007
Belarus	April 2019	May 2007
Bosnia & Herzegovina	April 2019	May 2007
Bulgaria	September 2007	May 2007
Croatia	September 2007	May 2007
Cyprus	April 2019	May 2007
Czech Republic	May 1998	May 1998
Estonia	September 2007	May 2007
Georgia	April 2019	May 2007
Hungary	May 1998	May 1998
Kazakhstan	April 2019	May 2007
Kosovo	July 2021	August 2021
Latvia	September 2007	May 2007
Lithuania	September 2007	May 2007
Macedonia	April 2019	May 2007
Moldova	April 2019	May 2007
Montenegro	October 2021	August 2021
Poland	May 1998	May 1998
Romania	May 1998	May 1998
Russia	May 1998	May 1998
Serbia	April 2019	May 2007
Slovakia	May 1998	May 1998
Slovenia	September 2007	May 2007
Turkey	May 1998	May 1998
Turkmenistan	April 2019	May 2007
Ukraine	May 1998	May 1998
Uzbekistan	April 2019	May 2007

Appendix Table 2. Cumulative (over 5-year horizon) changes relative to forecasts released in January 2022.

	GDP, %	CPI, %	Current account, USD bn	Investment, %	Consumption, %
	(1)	(2)	(3)	(4)	(5)
Panel A. April 2022 vintage					
Ukraine	-193.0	43.4	5.5	-329.9	-214.6
Russia	-92.3	28.6	533.9	-168.9	-115.4
Bulgaria	-11.6	8.8	-3.4	-18.8	-7.4
Romania	-12.7	6.0	-15.8	-32.6	-11.6
Poland	-6.8	9.9	-1.1	-11.8	-4.3
Czechia	-16.1	8.6	-23.2	-19.6	-17.1
Slovakia	-12.9	7.1	0.5	-21.0	-17.1
Slovenia	-4.7	5.0	-7.9	-10.5	4.4
Hungary	-6.0	6.7	-2.7	-21.7	-4.0
Croatia	-8.9	5.4	-1.1	-15.6	-7.1
Estonia	-10.3	7.4	1.6	-3.3	-24.1
Latvia	-20.0	4.5	1.0	-33.0	-25.0
Lithuania	-8.4	10.1	-13.7	-13.8	-15.1
Eastern Europe (average)	-10.8	7.2	-6.0	-18.1	-11.7
Panel B. July 2022 vintage					
Ukraine	-203.9	51.1	19.8	-320.8	-227.9
Russia	-88.6	21.2	160.4	-167.7	-99.5
Bulgaria	-14.0	16.8	-0.4	-32.2	-11.1
Romania	-3.9	13.8	-25.3	-23.1	-4.4
Poland	-7.2	16.8	-99.6	-14.3	-9.9
Czechia	-19.5	14.7	-31.0	-18.4	-27.4
Slovakia	-21.9	13.9	-9.0	-32.9	-22.5
Slovenia	-0.6	10.0	-8.4	-6.8	11.2
Hungary	-8.8	16.1	-23.9	-24.8	3.2
Croatia	-6.2	11.1	-3.6	-5.3	-7.2
Estonia	-16.7	15.7	2.2	-56.0	-19.3
Latvia	-21.7	14.7	-3.7	-35.2	-15.6
Lithuania	-10.3	17.8	-8.6	-14.7	-19.7
Eastern Europe (average)	-11.9	14.7	-19.2	-23.7	-11.2
Panel C. October 2022 vintage					
Ukraine	-206.7	60.2	8.5	-316.3	-221.8
Russia	-76.0	16.6	88.7	-136.8	-79.6
Bulgaria	-21.8	20.9	-7.4	-49.0	-22.2
Romania	-1.1	16.9	3.9	-17.9	1.9
Poland	-17.7	23.1	-84.5	-27.1	-14.1
Czechia	-27.6	19.3	-55.5	-20.2	-39.2
Slovakia	-34.0	19.6	-15.0	-61.2	-23.4
Slovenia	-2.5	13.0	-13.7	-13.7	8.4
Hungary	-21.5	27.4	-26.3	-38.1	-8.6
Croatia	-2.7	14.9	-3.5	-15.3	-4.0
Estonia	-31.5	25.6	4.2	-39.3	-27.3
Latvia	-28.8	18.7	-6.6	-41.9	-20.2
Lithuania	-15.0	22.2	-8.6	-28.2	-33.2
Eastern Europe (average)	-18.6	20.1	-19.4	-31.8	-16.6

Appendix Table 3. Cumulative (over 5-year horizon) changes in disagreement relative to forecasts released in January 2022.

	GDP, growth rate	CPI, inflation rate	Current account, USD bn	Investment, growth rate	Consumption, growth rate
	(1)	(2)	(3)	(4)	(5)
Panel A. April 2022 vintage					
Ukraine	34.1	14.4	-1.3	52.1	36.2
Russia	4.7	8.3	549.5	8.0	11.5
Bulgaria	-0.0	2.8	1.9	-3.4	3.4
Romania	0.1	1.0	9.2	-0.7	1.7
Poland	-0.1	2.2	73.3	3.2	0.6
Czechia	0.8	0.9	2.9	0.6	1.1
Slovakia	-0.3	1.5	8.4	1.1	0.1
Slovenia	0.4	1.9	4.3	3.9	0.9
Hungary	0.8	0.8	1.0	1.0	0.7
Croatia	-0.0	1.8	0.5	0.2	0.1
Estonia	0.6	0.2	-0.8	6.6	-2.9
Latvia	0.4	2.9	-0.1	-2.3	0.7
Lithuania	2.1	3.2	30.1	-1.1	1.0
Eastern Europe (average)	0.4	1.8	11.9	0.8	0.7
Panel B. July 2022 vintage					
Ukraine	29.1	12.0	44.0	36.1	18.4
Russia	2.5	7.0	361.3	10.8	3.2
Bulgaria	-0.6	5.1	14.4	-2.5	1.4
Romania	0.6	2.7	10.0	2.1	1.8
Poland	0.8	1.3	25.0	4.0	1.3
Czechia	0.6	2.3	-1.0	0.5	1.3
Slovakia	-1.0	4.0	9.7	3.6	-0.6
Slovenia	0.1	1.4	2.2	-2.8	1.2
Hungary	1.2	4.7	7.2	1.9	3.0
Croatia	0.3	1.3	2.0	-1.1	-0.2
Estonia	1.3	3.8	1.1	0.4	-2.9
Latvia	0.8	3.4	-2.9	-2.7	4.3
Lithuania	2.9	2.5	11.8	-1.5	-0.7
Eastern Europe (average)	0.6	2.9	7.2	0.2	0.9
Panel C. October 2022 vintage					
Ukraine	27.8	11.4	19.8	34.0	14.8
Russia	1.4	2.3	71.9	14.4	4.6
Bulgaria	-0.7	7.9	-0.5	1.4	1.2
Romania	0.9	2.7	11.1	1.5	2.2
Poland	-0.3	3.1	33.0	3.0	4.0
Czechia	0.1	1.6	21.8	1.1	0.6
Slovakia	-0.7	4.5	9.4	3.8	-0.1
Slovenia	0.4	1.9	7.8	-4.1	2.5
Hungary	1.7	6.0	3.3	3.6	3.1
Croatia	0.1	1.3	3.8	-2.9	0.5
Estonia	2.4	2.3	0.3	1.1	-2.6
Latvia	0.5	5.1	-0.2	0.3	0.3
Lithuania	2.1	2.5	9.2	-0.7	-1.2
Eastern Europe (average)	0.6	3.5	9.0	0.7	1.0

Appendix Table 4. War Intensity and spillovers, control for natural gas prices.

	Consensus Forecasts		Disagreement	
	coef	s.e.	coef	s.e.
	(1)	(2)	(3)	(4)
Panel A. GDP				
Ukraine	-2.14	(1.40)	1.01***	(0.21)
Russia	-1.35***	(0.42)	0.20***	(0.04)
Bulgaria	-0.54***	(0.15)	0.05*	(0.03)
Romania	-0.54***	(0.13)	-0.03	(0.03)
Poland	-0.67***	(0.24)	0.02	(0.01)
Czechia	-0.83***	(0.22)	0.00	(0.02)
Slovakia	-0.83***	(0.24)	0.03	(0.02)
Slovenia	-0.58***	(0.23)	-0.04	(0.04)
Hungary	-0.82***	(0.31)	0.04	(0.02)
Croatia	-0.54***	(0.20)	0.03	(0.02)
Estonia	-0.87***	(0.25)	0.17*	(0.09)
Latvia	-0.94***	(0.25)	0.02	(0.03)
Lithuania	-0.73***	(0.19)	0.11***	(0.03)
Eastern Europe (average)	-0.72***	(0.21)	0.04**	(0.02)
Panel B. CPI inflation				
Ukraine	2.15***	(0.78)	0.72***	(0.24)
Russia	1.48***	(0.61)	0.37***	(0.07)
Bulgaria	1.52***	(0.33)	0.40***	(0.13)
Romania	1.34***	(0.39)	0.08*	(0.05)
Poland	1.80***	(0.57)	0.16***	(0.06)
Czechia	1.14***	(0.38)	0.10**	(0.05)
Slovakia	1.47***	(0.45)	0.23***	(0.09)
Slovenia	1.06***	(0.24)	0.20***	(0.03)
Hungary	1.92**	(0.86)	0.16	(0.10)
Croatia	1.20***	(0.28)	0.16***	(0.04)
Estonia	1.15***	(0.28)	0.16***	(0.05)
Latvia	0.91***	(0.35)	0.11	(0.09)
Lithuania	1.10***	(0.34)	0.16***	(0.06)
Eastern Europe (average)	1.33***	(0.38)	0.17***	(0.05)
Panel C. Budget balance				
Ukraine	-5.77***	(1.36)	1.59***	(0.25)
Russia	-0.83***	(0.20)	0.18***	(0.07)
Bulgaria	-0.57***	(0.23)	0.05*	(0.03)
Romania	-0.17	(0.23)	-0.01	(0.02)
Poland	-0.60***	(0.24)	-0.01	(0.04)
Czechia	-0.19	(0.41)	-0.06	(0.04)
Slovakia	-0.68	(0.46)	0.06	(0.06)
Slovenia	-0.22	(0.33)	0.03	(0.05)
Hungary	-0.10	(0.30)	-0.00	(0.04)
Croatia	0.05	(0.17)	0.02	(0.02)
Estonia	-0.39	(0.30)	0.04	(0.08)
Latvia	-0.27	(0.26)	0.01	(0.07)
Lithuania	-0.33	(0.27)	0.01	(0.06)
Europe (average)	-0.32	(0.27)	0.01	(0.03)

Notes: the regression control for the World Bank's index of European natural gas prices. See notes to Table 5 for more details.