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UNCERTAINTY SHOCKS AND MACROECONOMIC SPILLOVERS IN EMERGING EUROPE: EUROZONE INSIDERS VS. OUTSIDERS

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Abstract

This paper examines how uncertainty shocks influence inflation, the current account, and real activity in emerging EU economies under different monetary regimes. Using quarterly data from 2004Q1 to 2024Q4, it compares countries with monetary autonomy (Poland, the Czech Republic, and Hungary) to Eurozone members (Slovenia, Slovakia, and Estonia). Country-level SVAR models are estimated, and dynamic effects are traced using orthogonalised impulse responses, with additional checks based on an extended sample (Romania, Latvia) and panel VAR results. The findings indicate a regime-specific trade-off. In economies with monetary autonomy, uncertainty shocks result in quicker and stronger inflation responses, consistent with exchange rate pass-through. Eurozone members display more limited inflation effects but experience deeper and more persistent declines in output, along with larger current account improvements driven mainly by weaker demand and reduced imports.

Keywords: European uncertainty index, monetary autonomy, EZ enlargement, macroeconomic adjustments, uncertainty shocks, structural VAR

1. INTRODUCTION

Since the 2004 EU enlargement, several emerging EU member states have joined Eurozone (EZ insiders), with Slovenia (2007), Cyprus and Malta (2008), Slovakia (2009), the Baltic states (2011–2015), Croatia (2023), and most recently Bulgaria (2026) adopting the euro. Others - Poland, the Czech Republic, Hungary, and Romania - have retained monetary sovereignty and remained outside the EZ (EZ outsiders). These outsider economies are far from homogeneous, differing not only in their institutional and policy frameworks, but also in broader patterns of monetary and financial behaviour (Mate & Brizar, 2024). Their hesitation intensified after the Global Financial Crisis (GFC) of 2007–2009 and the Eurozone Debt Crisis (EZ crisis) of 2010–2014, which exposed key weaknesses in the EZ architecture and contributed to a reassessment of the costs and benefits of euro adoption (Lane, 2012; Frieden & Walter, 2017; Dabrowski, 2019).

Amid recurrent global shocks and elevated macroeconomic uncertainty, understanding how different monetary regimes shape resilience has become increasingly important for both policymakers and EU institutions. This paper addresses the following question: How do exogenous uncertainty shocks affect the trade-off between internal and external balance in emerging EU economies under differing monetary and exchange rate regimes? As recent crises have become more frequent and persistent - and their transmission has differed across countries and policy frameworks - this question has gained renewed relevance. Uncertainty shocks reveal not only the potential benefits of monetary autonomy, but also the practical costs of surrendering sovereign monetary instruments, particularly for small open economies.

Previous research has predominantly focused on the repercussions of the GFC and the EZ crisis. This study expands the time horizon to include the more recent shocks associated with the COVID-19 pandemic (2020) and the Russia–Ukraine war period (2022), thereby capturing a more shock-intensive environment. Focusing on the trade-offs between internal balance (inflation, economic growth) and external balance (current account), we examine how exogenous crisis signals propagate across six emerging EU economies - Poland, the Czech Republic and Hungary (Monetary Autonomous – MA group) and Slovenia, Slovakia and Estonia (Eurozone – EZ group), over the period 2004Q1–2024Q4. The empirical analysis relies on a Structural Vector Autoregression (SVAR) model, with robustness tested by extending the sample to Romania and Latvia and by estimating panel VAR models for the MA and EZ groups.

This study employs the European Uncertainty Index (EUI) as an exogenous shock proxy to test the following hypotheses:

H1 – Uncertainty shocks generate stronger inflationary effects in MA economies, while EZ membership dampens pass-through via the euro's nominal anchor.

H2 – Uncertainty shocks improve the current account in both regimes, but through expenditure-switching in MA economies (exchange rate adjustment) and expenditure-reducing import compression in EZ members.

H3 – Uncertainty shocks cause deeper and more persistent output losses in EZ members (internal adjustment), while MA economies absorb part of the shock through exchange rate flexibility and countercyclical monetary policy.

This paper contributes to the literature in several ways. First, it extends the analysis of uncertainty shocks in emerging EU economies to a longer and more shock-intensive period, covering not only the GFC and the EZ crisis, but also the COVID-19 pandemic and the Russia–Ukraine war period. Second, it directly compares internal and external adjustment patterns across MA and EZ emerging EU economies. Third, it adds new SVAR-based evidence relevant to the policy debate on EZ enlargement and the timing of euro adoption (Dandashly & Verdun, 2018; Deskar-Škrbić & Kunovac, 2020; Bod, Pócsik, & Neszmélyi, 2021). The paper proceeds as follows: Section 2 reviews theoretical background and related literature; Section 3 provides descriptive evidence; Section 4 outlines the methodological framework; Section 5 presents and discusses the empirical results; the final section concludes.

2. THEORETICAL BACKGROUND AND LITERATURE REVIEW

The analysis of European monetary integration often starts from the OCA framework. A sustainable currency union requires mechanisms to absorb asymmetric shocks – labour mobility, wage and price flexibility, fiscal transfers – and sufficiently aligned business cycles (Mundell, 1961; McKinnon, 1963; Kenen, 1969). While trade integration may increase business-cycle synchronization (Frankel & Rose 1998), deeper integration can also foster specialization and reduce income correlation (Eichengreen, 1992; Krugman, 1993). In post-socialist EU members, transition-related rigidities constrained adjustment (Aslund, 2002). In parallel, the EMU's limited labour mobility and incomplete fiscal risk-sharing raised the costs of absorbing asymmetric shocks (Dabrowski, 2019).

EZ accession is also examined through the lens of the international monetary trilemma, which implies that monetary autonomy cannot be jointly maintained with exchange rate rigidity and full capital mobility (Fleming, 1962; Obstfeld & Taylor, 2017). EZ accession entails free capital mobility within the common market under a rigid monetary arrangement. Once national monetary autonomy is removed, the burden of adjustment shifts toward internal relative-price adjustment (wages and prices) and domestically conducted fiscal policy. In the absence of expenditure-switching through the exchange rate, competitiveness must be restored via expenditure-reducing adjustment – lower consumption, downward price and wage pressures, and output contraction – i.e. internal

devaluation (Krugman, 2013; Lane, 2012; Petroulakis, 2017). Evidence on internal devaluation is mixed: it may be associated with sharp contractions in demand and employment and slow competitiveness gains (Boros, 2021), and it can be socially and economically costly, especially in structurally weaker economies (Staehr, 2013; Kersan-Škabić, 2016), although some contributions point to potentially expansionary effects depending on the adjustment channel and horizon (Andrés, Arce, Fernández-Villaverde, & Hurtado, 2020). A growing body of research suggests that external shocks transmit more strongly under rigid exchange rate arrangements (Belhocine, Crivelli, Geng, Scutaru, Wiegand, & Zhan, 2016; Obstfeld, Ostry, & Qureshi, 2017), a concern also relevant for ERM II aspirants (Tchorek, 2017). By contrast, MA EU members can deploy exchange rate flexibility as a shock absorber, moderating output losses (Ghosh, Qureshi, & Tsangarides, 2014; Beker Pucar & Glavaški, 2020; Dąbrowski & Wróblewska, 2020).

In line with the regime-dependent interpretation of adjustment, the literature points to three key transmission channels that differ between MA and EZ settings. First, the nominal pass-through channel tends to be stronger where exchange rate movements feed rapidly into import prices and inflation expectations, while more credible low-inflation environments are associated with lower exchange rate pass-through (Ca' Zorzi, Hahn, & Sánchez, 2007; Jašová, Moessner, & Takáts, 2019). Second, uncertainty shocks trigger precautionary behaviour and tighter financial conditions, affecting domestic absorption and external adjustment; under monetary autonomy, expenditure-switching via depreciation can facilitate external adjustment, whereas in a currency union adjustment may rely more on demand-driven import compression (Ghosh et al. 2014; Bobasu & De Santis, 2022). Third, in the absence of sovereign monetary instruments, adjustment in EZ members shifts toward real-side channels (wages, employment and fiscal consolidation), which raises the value of risk-sharing and fiscal stabilization capacity within EMU (Sørensen & Yosha, 1998; European Central Bank, 2018).

The Global Financial Crisis (2007–09) and the subsequent Eurozone debt crisis (2010–14) exposed critical vulnerabilities of the euro area and reshaped the political economy of euro adoption in non-euro EU members (Czech, 2015; Frieden & Walter, 2017). For several monetary-autonomy (MA) EU members, crisis experience strengthened the perception that staying outside the euro area could preserve policy room for manoeuvre, reinforcing "outsider" strategies and delaying accession (Dandashly & Verdun, 2018; Tabajdi & Végh, 2021; Beker Pucar & Glavaški, 2020). Structural constraints of the euro area – persisting divergences, limited labour mobility and the absence of a full fiscal capacity – continue to challenge its coherence with OCA conditions (Marer, 2016; Louzek, 2023). More recently, the COVID-19 shock and Russia's invasion of Ukraine amplified uncertainty and generated a major energy shock, weighing on euro area activity and external balances and contributing to broader macro-financial tightening (Adolfsen, Kuik, Lis, & Schuler, 2022; Ahir, Bloom, &

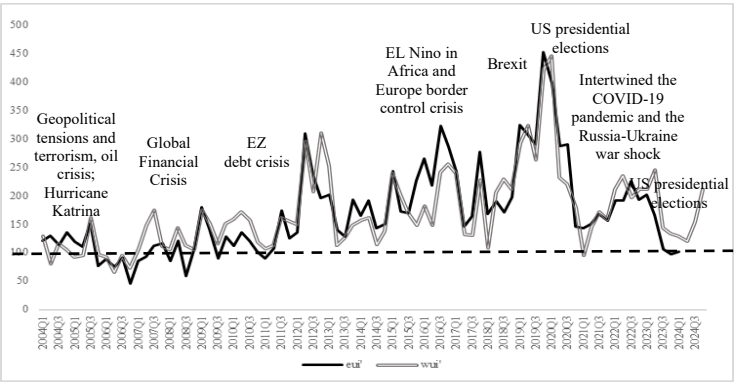
Furceri, 2022; Bobasu & De Santis, 2022; Emter, Fidora, Pastoris, & Schmitz, 2023).

Taken together, the OCA framework and the trilemma highlight the central trade-off of euro adoption: the loss of monetary autonomy and the exchange rate channel shifts crisis adjustment toward internal relative-price and demand adjustment, with potentially sizeable real and social costs (Lane, 2012; Petroulakis, 2017; Boros, 2021). Evidence also suggests that the transmission of external shocks is shaped by the exchange rate regime: rigid arrangements tend to amplify real adjustments, whereas exchange rate flexibility can act as a shock absorber, albeit often at the cost of higher inflation exposure (Ghosh et al., 2014; Belhocine et al., 2016; Obstfeld et al., 2017). These mechanisms are particularly salient in periods of heightened uncertainty and geopolitical shocks (Ahir et al., 2022; Bobasu & De Santis, 2022). Building on this literature and the regime-dependent transmission channels, the empirical analysis tests whether uncertainty shocks generate systematically different spillovers to inflation, output and the current account in MA vs. EZ emerging EU economies. This regime-dependent trade-off materialises through the nominal pass-through, external adjustment, and internal devaluation channels discussed above.

3. DESCRIPTIVE ANALYSIS

Ahir et al. (2022) develop the World Uncertainty Index (WUI), which captures global and regional spikes in uncertainty and is associated with weaker macroeconomic outcomes. The European regional series (WUI-Europe; hereafter EUI) is retrieved from Federal Reserve Bank of St. Louis database (FRED) and used as the uncertainty proxy for Europe. In this study, innovations in the EUI are treated as an exogenous structural shock to assess how uncertainty affects internal and external balance in selected EZ vs. MA emerging EU economies. The EUI is commonly used as a proxy for crisis-type uncertainty, as it captures unexpected surges in macroeconomic uncertainty that typically accompany recessions, financial disruptions, geopolitical escalations, or pandemics. This interpretation is consistent with empirical evidence showing that uncertainty shocks significantly depress economic activity (e.g., Bloom, 2009; Caggiano, Castelnuovo, & Groshenny, 2014; European Central Bank, 2020; Miescu & Rossi, 2021; Comunale & Nguyen, 2023). Figure 1 shows that the EUI closely tracks the WUI, while exhibiting more pronounced spikes during region-specific episodes such as the EZ crisis, the European border-control/migration crisis, as well as the Brexit.

Figure 1 WUI and EUI in the period 2004Q1-2024Q4

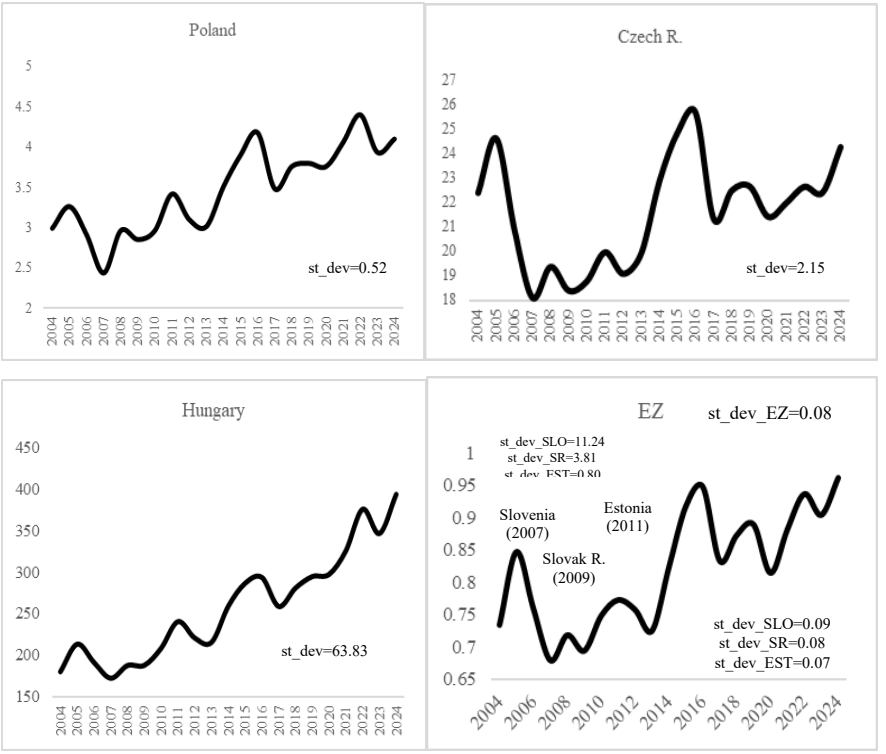


Source: World Uncertainty Index (WUI) and European Uncertainty Index (EUI) by Ahir, Bloom, & Furceri (2025); data accessed via FRED, quarterly data.

A crucial distinction among the six examined emerging EU members lies in their respective monetary frameworks and the specific adjustment mechanisms associated with them. The presence of monetary autonomy in countries such as Poland, the Czech Republic, and Hungary, on the one hand, and the loss of monetary sovereignty within the EZ, on the other, fundamentally shapes their responses to exogenous crisis shocks. One of the main tools available to MA countries is nominal exchange rate (NER) depreciation, which can support external price competitiveness and partly cushion real activity in downturns (Ghosh et al., 2014; Dabrowski & Wróblewska, 2016; Dabrowski & Wróblewska, 2019). In contrast, EZ membership removes the NER as an adjustment instrument, shifting part of the adjustment burden toward internal devaluation and other domestic mechanisms; moreover, cross-country fiscal risk sharing is comparatively limited, reinforcing the role of internal adjustment (European Central Bank, 2018; Andrés et al., 2020).

Figure 2 provides a descriptive overview of NER movements against the U.S. dollar (USD) in Poland, the Czech Republic, and Hungary, together with the euro, over the period 2004-2024. The figure suggests greater exchange rate variability in the MA economies, particularly in Hungary, while the euro displays considerably lower volatility. The standard deviation values support this descriptive impression. Overall, the pattern is consistent with the view that NER adjustment played a more visible role in the MA economies, whereas exchange rate fluctuations were more limited in the EZ environment after euro adoption.

Figure 2 NER movements against the USD in selected MA economies and the euro, 2004-2024



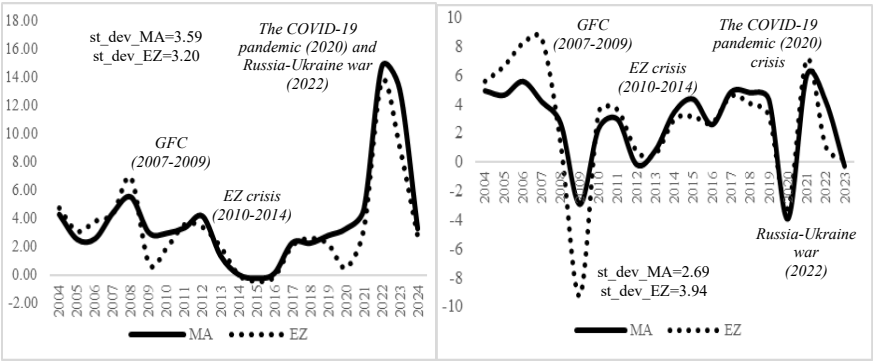
Notes: st_dev – standard deviation; SLO – Slovenia; SR – Slovak Republic; EST – Estonia;

Source: authors' calculations based on International Monetary Fund (IMF), International Financial Statistics (IFS), annual data.

Figures 3 and 4 present macroeconomic indicators (proxies) for internal and external balance in analyzed emerging EU economies. Specifically, Figure 3 illustrates the nominal aspect of internal balance - namely, the inflation rate - for the MA and EZ country groups over the 2004-2024 period. In recent years, inflation in Europe has been among the highest observed in decades, with particularly strong increases during the overlapping COVID-19 (2020) and Russia–Ukraine (2022) crisis episodes (Honohan, 2024). Inflation rose sharply in 2021, largely reflecting surging energy prices, pandemic-related supply bottlenecks, and the rebound in global demand for goods; the Russian invasion of Ukraine further intensified inflationary pressures through elevated energy and commodity prices and renewed supply disruptions (Adolfsen et al., 2022; Pejčić, Sekulić, & Glavaški, 2024). Looking at another dimension of internal balance - real GDP growth - a contraction in economic activity is registered during the

GFC, the EZ crisis, the pandemic, and the geopolitical shock. According to the standard deviation indicator, inflation variability is more pronounced in the MA group (3.6) compared to EZ group (3.2), while GDP variation is greater in the EZ group (3.9) compared to MA group (2.7).

Figure 3 Inflation rate (left) and GDP growth (right) in MA vs. EZ members in the period 2004-2024

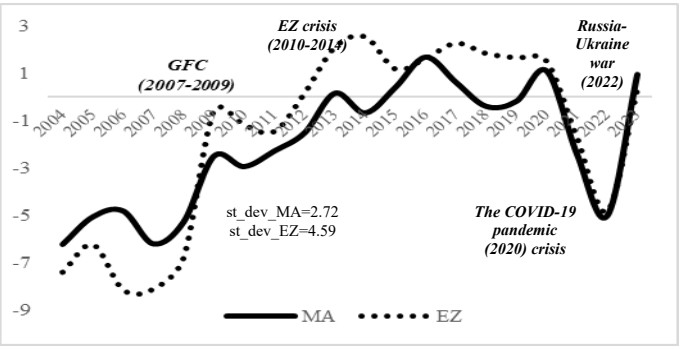


Notes: st_dev – standard deviation; MA – monetary autonomous emerging EU members (Poland, Czech Republic, Hungary); EZ – emerging EZ members (Slovenia, Slovak Republic, Estonia).

Source: the authors based on annual data from IMF's IFS (inflation rate) and World Bank's World Development Indicators - WDI (GDP growth).

Considering the indicator of external (im)balance - current account as a percentage of GDP (Figure 4) – the current account remained in deficit up until the outbreak of the GFC, when countries were forced into external adjustments, leading to a subsequent improvement in external positions (Atoyan, Manning, & Rahman, 2013). The current account remained in surplus until the emergence of the COVID-19 pandemic crisis, after which external positions weakened again, reflecting crisis-specific channels and the post-pandemic/energy-price environment (Emter et al., 2023). Comparing the MA and EZ groups, a more unstable external position is observed among the EZ countries, reflected in deeper deficits during certain crisis episodes, followed by faster recoveries during the adjustment periods. Evidently, the current account tends to improve in some crisis episodes (e.g., the GFC, EZ crisis) due to contractions in domestic demand and import compression, while during the COVID-19 pandemic crisis, current account deficits deepened. Overall, the specific trigger and channels of contagion shape the spillover mechanism across crisis. The variability of the current account indicator is significantly more pronounced in the emerging EZ members (4.6) compared to the emerging MA EU economies (2.7).

Figure 4 Current account as a % of GDP in analyzed MA vs. EZ emerging EU countries



Notes: st_dev – standard deviation; MA – monetary autonomous emerging EU members (Poland, Czech Republic, Hungary); EZ – emerging EZ members (Slovenia, Slovak Republic, Estonia).

Source: the authors based on annual data from World Bank's WDI.

The general impression arising from the analysis of the NER, inflation, economic growth, and current account following the accession of the observed emerging European economies to the EU is as follows: (i) greater variability of the NER in MA countries, reflecting its role as an adjustment channel vs. generally lower NER variability in EZ members upon euro adoption; MA countries exhibit greater inflation variability compared to EZ members, despite similar inflation trajectories during major crisis episodes; (ii) the current account, as a percentage of GDP, displays greater volatility in EZ members compared to the more stable external positions of MA economies; (iii) the real economy, reflected in GDP growth/contraction, is more volatile and unstable in the case of EZ members.

4. METHODOLOGICAL FRAMEWORK

This section outlines the empirical strategy used to assess how uncertainty shocks propagate through internal and external balance indicators in emerging EU economies with differing monetary and exchange rate arrangements, building on the theoretical mechanisms presented in Section 2. The empirical approach follows directly from the research question: if monetary autonomy provides a shock-absorbing mechanism, then uncertainty shocks should trigger different short-run adjustment paths in inflation, the current account and real activity across MA and EZ members. To test this mechanism, the analysis applies a SVAR model, supported by standard stationarity tests, identification restrictions grounded in economic theory, and post-estimation diagnostic checks (Lütkepohl, 2005; Kilian & Lütkepohl, 2017).

The sample covers six emerging EU members over the period 2004Q1–2024Q4. Poland, the Czech Republic and Hungary represent MA economies that retain independent monetary policy under floating or managed-floating exchange rate regimes. Slovenia, the Slovak Republic and Estonia form the EZ group, operating under a rigid exchange rate regime without national monetary sovereignty. The baseline sample was deliberately constructed as a balanced comparison between three MA and three EZ economies that are broadly comparable in terms of post-socialist transition legacy, EU integration trajectory, and data availability over the full observation period. The parsimonious baseline design was chosen to preserve cross-country comparability, while additional cases are included in the robustness analysis in order to test whether the core results remain stable beyond the initial country grouping.

The empirical analysis uses quarterly data for four variables capturing uncertainty, nominal stability, external balance and real performance: (i) the European Uncertainty Index (*eui*) as a proxy of an exogenous crisis shock; (ii) the Consumer Price Index, included in the model as the first difference of its logarithm (*dcpi*), reflecting price changes as one aspect of nominal internal balance; (iii) the Current Account balance as a percentage of GDP (*ca*), indicating the state of external balance; and (iv) the first difference of log real GDP (*dgdp*), interpreted as an approximation of real GDP growth and used to capture expansions or contractions in real activity. To ensure cross-country comparability, the variables *eui* and *cpi* (indices), as well as *gdp* (absolute level) are log-transformed, while *ca* is expressed as a percentage of GDP. The NER is not included as an endogenous variable in the baseline SVAR specification; accordingly, references to exchange rate depreciation and pass-through in the discussion are mechanism-based interpretations rather than direct impulse response estimates for NER. For descriptive purposes, annual data were compiled from the IMF's IFS and the World Bank's WDI. As the SVAR model requires quarterly data, the econometric analysis is based on quarterly series for the consumer price index, current account as a percentage of GDP, and real GDP obtained from the IMF's IFS, while the EUI was retrieved from the FRED.

Before estimation, unit-root properties were examined using Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests, supported by correlograms and visual inspection (Dickey & Fuller, 1979; Phillips & Perron, 1988). Results show that *eui* and *ca* are I(0) across countries, while *cpi* and *gdp* are I(1). Given mixed integration orders and the absence of a common cointegrating framework for the full system, the analysis proceeds with an SVAR specification in stationary form, where the I(1) series are first-differenced to ensure stationarity. The SVAR framework is adopted because it enables economically interpretable structural shocks and impulse responses under an explicit identification scheme (Breitung, Brüggemann, & Lütkepohl, 2004; Kilian & Lütkepohl, 2017). Dynamic transmission effects of uncertainty and other external shocks are explored with (O)IRFs derived from estimated (S)VAR models, in line with empirical applications in Maćkowiak (2007), Carriero, Mumtaz, Theodoridis,

and Theophilopoulou (2015), Feldkircher (2015), Kucharcukova, Claeys, and Vasicek (2016), Belke and Kronen (2017), Moder (2017), Dabrowski and Wroblewska (2019), and Lesuisse (2019), among others.

The reduced-form VAR can be expressed as:

$$Y_t = C + A_1 Y_{t-1} + \cdots + A_p Y_{t-p} + u_t,$$

where Y_t = *(eui, dcpi, ca, dgdp)'* is a vector of endogenous variables and u_t are reduced-form residuals.

The structural representation is:

$$BY_t = C + B_1 Y_{t-1} + \cdots + B_p Y_{t-p} + \varepsilon_t,$$

where B contains contemporaneous relationships and ε_t denotes orthogonal structural shocks. Lag length (p) was chosen using standard information criteria (AIC, HQIC, SBIC) separately for each country.

Structural shocks are recovered using recursive (Cholesky-type) ordering grounded in macroeconomic theory: *eui* → *dcpi* → *ca* → *dgdp.* The variable *eui* is treated as strictly exogenous, reflecting external uncertainty shocks not influenced contemporaneously by domestic conditions. The *dcpi* responds immediately to uncertainty, consistent with price expectations and exchange rate pass-through; *ca* reacts within the same quarter through trade, precautionary savings and import compression; and *dgdp* adjusts last, reflecting real-side spillovers after nominal and external responses. This hierarchy enables a transparent economic interpretation of shocks and mitigates simultaneity concerns typical of unrestricted VAR models (Breitung et al., 2004; Belke & Kronen, 2017; Kilian & Lütkepohl, 2017).

Dynamic transmission of crisis shocks is traced using orthogonalized impulse response functions (OIRFs) derived from the SVAR (Stock & Watson, 2001; Lütkepohl, 2005). OIRFs isolate the effect of a one-unit structural shock in the EUI on domestic inflation, current account, and real GDP growth over a four-quarter horizon, accounting for contemporaneous correlations among innovations. This enables a structurally meaningful and causally interpretable assessment of how uncertainty affects internal and external balance under differing monetary regimes. The next section discusses the empirical results and compares the adjustment paths of MA and EZ members, highlighting the internal-external balance trade-off under uncertainty shocks.

5. RESULTS AND DISCUSSION

We interpret the impulse responses through three regime-dependent transmission channels: (i) Nominal pass-through channel: uncertainty raises risk premia and exchange rate pressures. In MA economies, depreciation transmits quickly into consumer prices through import prices and inflation expectations, while in EZ members the common currency dampens exchange rate pass-through

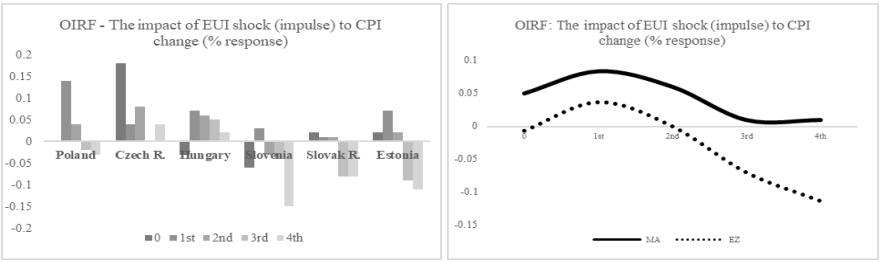
and strengthens nominal anchoring (Ca' Zorzi et al., 2007; Jašová et al., 2019; Ortega, Osbat, & Rubene, 2020). (ii) External adjustment channel: uncertainty induces precautionary behaviour and tighter financial conditions, reducing domestic absorption. In MA economies, expenditure-switching via depreciation can contribute to current-account adjustment alongside import compression, whereas in EZ members adjustment relies more strongly on demand-driven import compression (Atoyan et al., 2013; Ghosh et al., 2014). (iii) Real adjustment/internal devaluation channel: without sovereign monetary policy, EZ members absorb shocks through real-side adjustment (employment, wages, credit, and fiscal tightening), consistent with internal devaluation mechanisms that can amplify and prolong output losses (European Central Bank, 2018; Andrés et al., 2020). By contrast, MA economies can partially smooth shocks through exchange rate flexibility and countercyclical monetary policy, reducing the persistence of real contraction.

Cross-country heterogeneity within each group reflects differences in trade openness, foreign exchange liabilities, initial external imbalances, and domestic policy space, which affect the relative strength of these three channels. In our estimates, the pass-through channel dominates the CPI response in MA economies (Figure 5), whereas the external adjustment and internal devaluation channels dominate the current account and GDP responses in EZ members (Figures 6–7). Figures 5-7 display country-level OIRFs (left panels) and averaged group responses for MA and EZ members (right panels).

5.1. Spillover effects on inflation

Consistent with the nominal pass-through channel, uncertainty shocks generate a stronger and faster CPI response in MA economies than in EZ members. The OIRFs in Figure 5 show that a one-unit increase in EUI raises inflation in all MA economies during the first two quarters after the shock. Exchange rate depreciation, higher risk premia, and less firmly anchored expectations translate uncertainty into rapid price adjustments via import prices and inflation expectations. On average, consumer prices in the MA group rise by around 0.1% in the first quarter, with Poland and Hungary recording the strongest short-run responses (left panel of Figure 5). The stronger reaction in Poland and Hungary is consistent with a more pronounced exchange rate channel and higher risk premia during uncertainty episodes, whereas the weaker response in the remaining MA economy suggests comparatively stronger nominal anchoring and/or lower effective pass-through. An alternative interpretation is that part of the inflation response reflects energy and import-price sensitivity rather than purely monetary-regime effects; however, the systematic MA–EZ contrast and the faster dissipation in EZ members point to the stabilizing role of a stronger nominal anchor. Overall, these findings align with evidence that exchange rate pass-through is typically higher and faster in emerging markets and floaters than in advanced monetary unions (Ca' Zorzi et al., 2007; Jašová et al., 2019).

Figure 5 The impact of EUI shock to inflation in selected emerging EU economies in the period 2004Q1-2024Q4



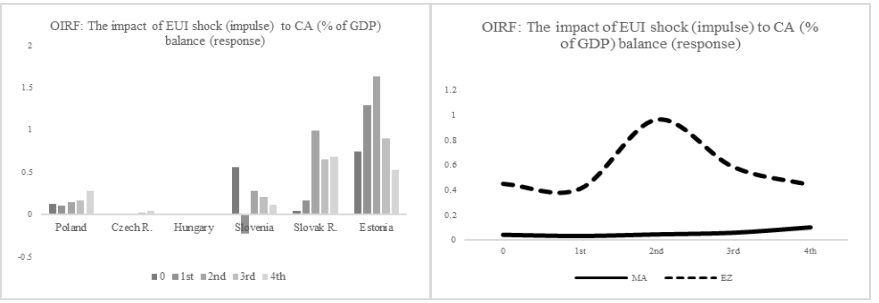
Source: authors' estimations based on Stata 15.

In contrast, emerging EZ members exhibit a weaker and shorter-lived inflation response. The peak effect in the EZ group reaches around 0.03% in the first quarter, dissipates within two quarters, and turns slightly negative in Slovenia and Estonia (right panel of Figure 5). In a monetary union, the common currency limits exchange rate pass-through into domestic prices and strengthens nominal anchoring through credibility and more firmly anchored inflation expectations (Ortega et al., 2020; Ehrmann, Georgarakos, & Kenny, 2023). Taken together, these results confirm Hypothesis 1. Monetary autonomy increases nominal flexibility but exposes MA economies to stronger inflationary pressures, while supranational monetary policy in the EZ dampens pass-through effects at the cost of limiting national macroeconomic discretion.

5.2. Spillover effects on the current account

An uncertainty shock improves the current account in both groups, but through different channels (Figure 6). In the EZ group, the size and speed of the improvement are more consistent with demand-driven import compression than with export-led rebalancing, suggesting that the 'stabilization' comes at the cost of foregone domestic demand rather than competitiveness gains. In MA economies, depreciation makes imports more expensive and domestic output relatively cheaper, producing moderate expenditure-switching alongside a contraction in import demand. On average, the improvement reaches around 0.1% of GDP within four quarters, with Poland recording the strongest reaction among MA members.

Figure 6 The impact of EUI shock to current account balance in selected emerging EU economies in the period 2004Q1-2024Q4



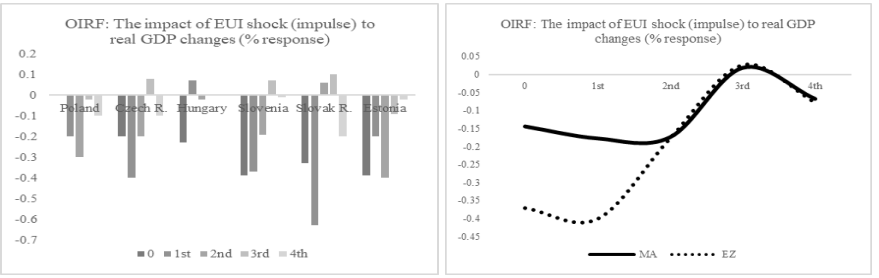
Source: authors' estimations based on Stata 15.

In EZ members, the adjustment is deeper and faster. The current account improves by approximately 0.9% of GDP after two quarters (right panel of Figure 6). With no exchange rate channel, households and firms adjust through postponed consumption and investment, precautionary savings, and stronger import compression. Limited fiscal risk sharing within the monetary union and tighter financial conditions can reinforce this mechanism, increasing the burden of adjustment on domestic absorption (European Central Bank, 2018; Andrés et al., 2020). Estonia shows the most pronounced improvement, consistent with the idea that highly open economies in a monetary union may react to uncertainty shocks through sharp contractions in domestic demand and imports, thereby amplifying the import-compression channel (Atoyan et al., 2013; Staehr, 2013). While the positive current account response may appear stabilizing, it reflects a costly adjustment: reduced consumption and investment rather than export-led correction. Thus, the findings confirm Hypothesis 2: without the nominal channel, EZ members absorb shocks primarily through real-side compression.

5.3. Spillover effects on real activity

Uncertainty shocks generate a recessionary effect in all observed economies, but magnitude and persistence differ (Figure 7). MA economies experience a relatively short-lived contraction: real GDP growth falls by up to around 0.2% in the first two quarters, after which output stabilizes. Exchange rate flexibility and greater policy space can reduce real adjustment costs and support recovery, a pattern often documented for emerging floaters facing external shocks (Dabrowski & Wroblewska, 2019; Beker Pucar & Glavaški, 2020). The shorter MA contraction is consistent with the availability of monetary and exchange rate adjustment, although part of the difference may also reflect structural factors such as sectoral composition and openness.

Figure 7 The impact of EUI shock to economic growth in selected emerging EU economies in the period 2004Q1-2024Q4



Source: authors' estimations based on Stata 15.

EZ members exhibit a deeper and more persistent recession. A one-unit rise in uncertainty reduces real GDP growth by approximately 0.4% in the first quarter, with further contraction continuing over the subsequent quarters (right panel of Figure 7). This mechanism is consistent with the adjustment pattern in small EZ entrants, where real-side adjustment – wages, employment, credit, and fiscal tightening – substitutes for nominal adjustment, implying internal devaluation dynamics that can amplify output losses (Petroulakis, 2017; Andrés et al., 2020; Boros, 2021). More broadly, multi-country evidence indicates that unexpected uncertainty shocks significantly contract real activity in the euro area and increase macroeconomic volatility (Belke & Kronen, 2017; Hauzenberger, Böck, Pfarrhofer, Stelzer, & Zens, 2018; Comunale & Nguyen, 2023). The contrast relative to MA economies supports Hypothesis 3: monetary autonomy cushions real activity during crisis shocks.

5.4. Diagnostic Checks and Robustness

Model adequacy was verified through standard stability and residual diagnostics. All estimated SVARs satisfy the eigenvalue stability condition, indicating that the implied dynamics converge. The Lagrange-multiplier test does not reject the null of no residual autocorrelation. Detailed diagnostic results for each country are reported in Appendix A.

To assess robustness, Appendix B presents SVAR estimates for Latvia and Romania, while Appendix C reports group-level evidence from a panel VAR specification (MA vs. EZ) as an additional validity check. Panel VAR estimations follow the standard approach in Love and Zicchino (2006) and Abrigo and Love (2016). Robustness analyses confirm the baseline patterns. Additional SVAR estimations for Romania (MA) and Latvia (EZ) reproduce the same inflation-external-real transmission structure (Appendix B). Panel VAR estimations for MA and EZ groups (Appendix C) yield consistent impulse responses: stronger

inflation responses and faster post-shock recovery in MA economies vs. muted inflation and deeper real contraction in the EZ.

5.5. Policy Implications

The empirical results highlight several policy considerations relevant for prospective EZ entrants. While joining the monetary union can strengthen credibility and nominal anchoring - supporting lower inflation persistence and reduced exchange rate volatility - it also entails sacrificing sovereign monetary and exchange rate instruments that can cushion real and external shocks, consistent with the classic optimum currency area (OCA) trade-off (Mundell, 1961; McKinnon, 1963; Kenen, 1969) and the post-crisis reassessment of EMU architecture (De Grauwe, 2013). In an increasingly shock-prone environment, this trade-off becomes more visible: the absence of exchange rate adjustment channels shifts part of the adjustment burden toward internal devaluation and domestic-demand compression, which can deepen and prolong recessions when risk sharing and fiscal stabilisation capacity are limited (Allard, Brooks, Bluedorn, Bornhorst, Christopherson, Ohnsorge, & Poghosyan, 2013; European Central Bank, 2018; Andrés et al., 2020).

For emerging EZ outsiders, the value of monetary autonomy therefore lies not only in exchange rate flexibility, but also in the capacity to conduct countercyclical policy without supranational constraints. The findings suggest that convergence toward the EZ should be complemented by deeper fiscal integration, stronger risk-sharing mechanisms and a more complete financial architecture to smooth asymmetric shocks (European Central Bank, 2018; Cimadomo, Furtuna, & Giuliodori, 2020). Recent initiatives such as NextGenerationEU and the Recovery and Resilience Facility can be interpreted as steps toward a stronger common stabilisation capacity, but their effectiveness depends on scale, persistence and implementation (European Commission, 2022, 2024; European Central Bank, 2024). Otherwise, the costs of adjustment are likely to continue falling disproportionately on real activity. In this respect, the hesitation of several MA economies to complete euro adoption can be interpreted as economically rational timing - reflecting a reassessment of when credibility gains outweigh the costs of reduced adjustment capacity under recurring global shocks.

6. CONCLUDING REMARKS

This paper examined whether uncertainty shocks generate systematically different macroeconomic adjustment patterns in emerging EU economies inside and outside the EZ. Episodes of rising uncertainty accentuate the inflation-output-external balance trade-off, shaped by differences in monetary sovereignty, integration, and adjustment capacity. Using country-level SVARs for the period 2004Q1–2024Q4, supplemented by panel VAR evidence as a robustness check,

the results reveal a clear divergence between Poland, the Czech Republic and Hungary (EZ outsiders) and Slovenia, Slovakia and Estonia (EZ insiders).

The evidence points to a regime-specific trade-off. Euro adoption strengthens nominal anchoring and dampens short-run inflation responses, but it comes at the cost of relinquishing national monetary and exchange rate instruments that can cushion real activity and facilitate external adjustment. When uncertainty rises, the absence of an exchange rate channel shifts adjustment toward internal mechanisms, resulting in deeper and more persistent output losses and external rebalancing largely driven by domestic-demand compression. By contrast, monetary autonomy allows nominal adjustment through the exchange rate, which helps absorb shocks and supports a smoother post-shock recovery.

These findings carry clear policy implications. For EZ outsiders, the benefits of retaining monetary sovereignty appear particularly relevant in an environment characterized by recurrent large shocks. For small and highly open economies already inside the EZ, stronger fiscal integration, more effective risk-sharing arrangements, and access to countercyclical stabilization instruments would reduce the burden of adjustment falling on domestic output and employment.

This study contributes to the literature in three ways. First, it covers the most recent crisis episodes up to 2024, including the overlapping shocks of the COVID-19 pandemic and the Russia-Ukraine war period. Second, it provides a consistent MA-EZ comparison using harmonized SVAR estimates and complementary panel evidence. Third, it offers new empirical evidence on how uncertainty shocks reshape the inflation-output-external balance nexus under different monetary regimes, informing the policy debate on EZ enlargement and stabilization in small open economies.

While the findings are robust, the analysis has limitations related to the parsimonious model structure and the exclusion of explicit fiscal and financial transmission channels. An additional limitation concerns the temporal coverage of the EZ group: although the full sample spans 2004Q1–2024Q4, the countries classified as EZ members adopted the euro only later. Consequently, part of the observations for the EZ group refers to the pre-adoption period. The findings should therefore be interpreted with caution as evidence on broader regime-related adjustment patterns, rather than as a pure post-euro-adoption treatment effect. Future work could estimate crisis-specific subsamples (GFC/EZ crisis vs. pandemic/war episodes) and expand the country coverage, while also incorporating alternative global-shock proxies and additional policy variables in a dual-panel setting.

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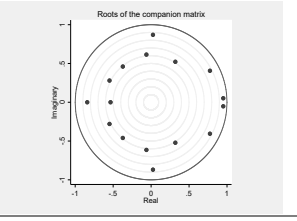
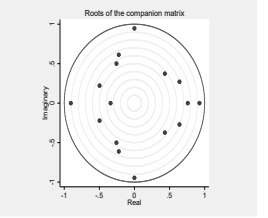
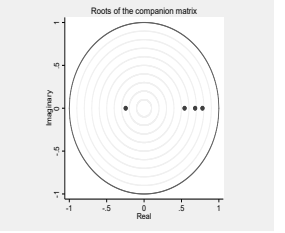
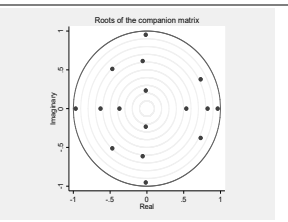
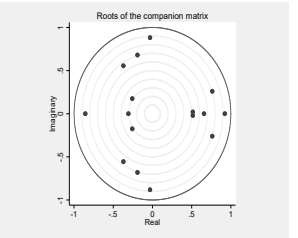
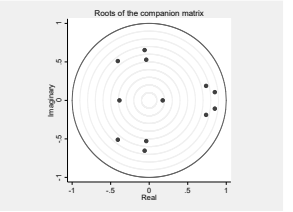
APPENDIX A

POST-ESTIMATION DIAGNOSTIC CHECKS FOR POLAND, CZECH REPUBLIC, HUNGARY, SLOVAK REPUBLIC, AND ESTONIA

Table 1 Post-estimation diagnostic checks

Country	Lagrange-multiplier test		VAR stability
	H0: no autocorrelation at lag order		Eigenvalue stability condition
Poland SVAR(4)	Lag	*p*-value	
	0	0.77	All the eigenvalues lie inside the unit circle. VAR satisfies stability condition.
	1	0.68	
Czech R. SVAR(4)	Lag	p-value	
	0	0.47	All the eigenvalues lie inside the unit circle. VAR satisfies stability condition.
	1	0.99	
Hungary SVAR(1)	Lag	p-value	
	0	0.33	All the eigenvalues lie inside the unit circle. VAR satisfies stability condition.
	1	0.27	

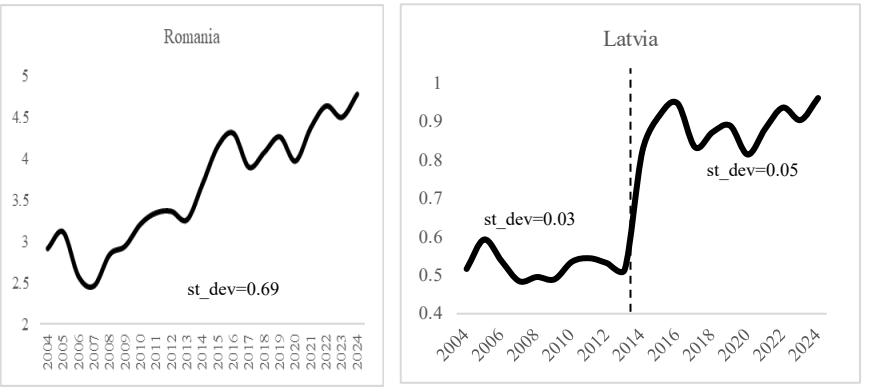
Slovenia		p-value	
SVAR(4)	Lag		
	0	0.39	All the eigenvalues lie inside the unit circle. VAR satisfies stability condition.
	1	0.53	
Slovak R. SVAR(4)	Lag	p-value	
	0	0.72	All the eigenvalues lie inside the unit circle. VAR satisfies stability condition.
	1	0.19	
Estonia SVAR(3)	Lag	p-value	
	0	0.22	All the eigenvalues lie inside the unit circle. VAR satisfies stability condition.
	1	0.90	

Source: authors' estimations based on Stata 15.

APPENDIX B

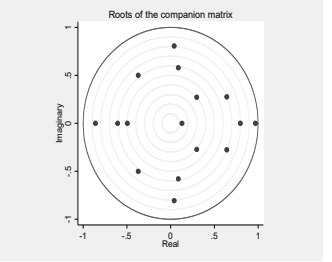
ROBUSTNESS: ROMANIA AND LATVIA (SVAR)

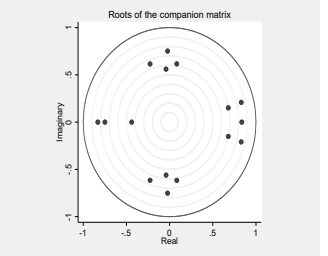
Figure 8 NER of Romanian leu, Latvian lats and euro per USD in the period 2004-2024



Source: authors' calculations based on IMF's IFS, annual data.

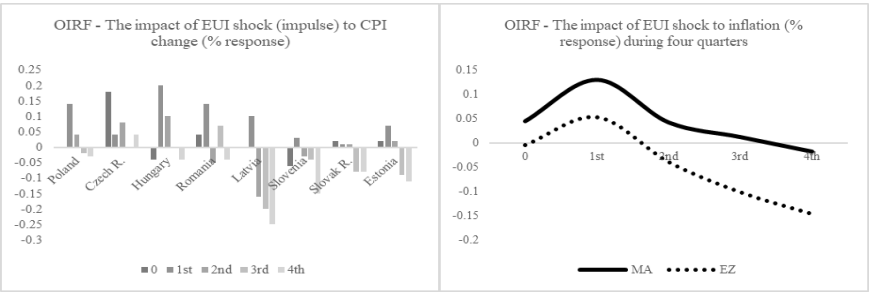
Table 2 Post-estimation diagnostic checks for Romania and Latvia

Country	Lagrange-multiplier test		VAR stability
	H0: no autocorrelation at lag order		Eigenvalue stability condition
Romania SVAR(4)	Lag	p-value	
	0	0.08	All the eigenvalues lie inside the unit circle. VAR satisfies stability condition.
	1	0.17	

Latvia SVAR(4)	Lag	p-value	
	0	0.23	All the eigenvalues lie inside the unit circle. VAR satisfies stability condition.
	1	0.15	

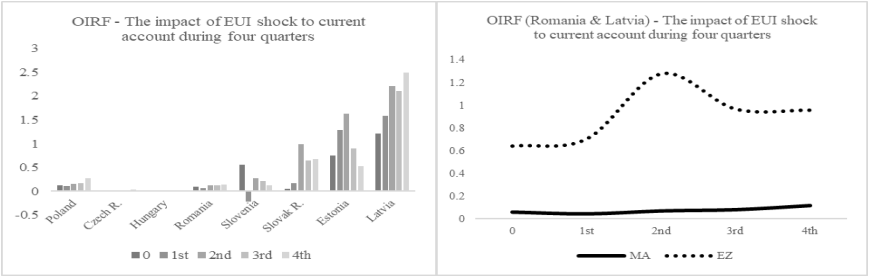
Source: authors' estimations based on Stata 15.

Figure 9 The impact of EUI shock to inflation with inclusion of Romania and Latvia in the period 2004Q1-2024Q4



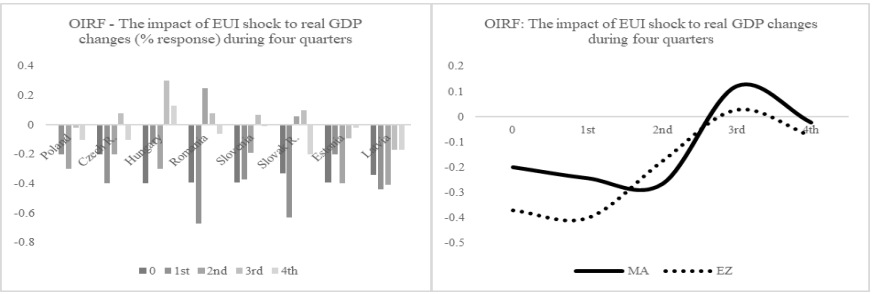
Source: authors' estimations based on Stata 15.

Figure 10 The impact of EUI shock to current account balance with inclusion of Romania and Latvia in in the period 2004Q1-2024Q4



Source: authors' estimations based on Stata 15.

Figure 11 The impact of EUI shock to economic growth with the inclusion of Romania and Latvia in the period 2004Q1-2024Q4

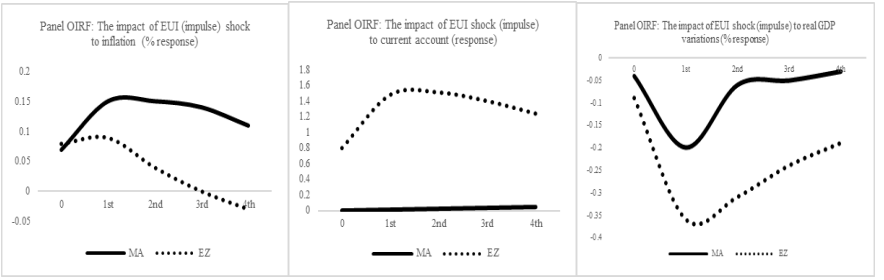


Source: authors' estimations based on Stata 15.

APPENDIX C

ROBUSTNESS: PANEL VAR (MA VS. EZ)

Figure 12 The impact of EUI shock to inflation, current account and economic growth of MA vs. EZ members in the period 2004Q1-2024Q4



Source: authors' estimations based on Stata 15.

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ŠOKOVI NEIZVJESNOSTI I MAKROEKONOMSKA PRELIJEVANJA U EUROPI U USPONU: ČLANICE NASUPROT DRŽAVAMA IZVAN EUROPODRUČJA

Sažetak

Rad analizira učinke šokova neizvjesnosti na inflaciju, tekući račun i realnu aktivnost u zemljama srednje i istočne Europe, uz usporedbu različitih monetarnih režima. Na temelju tromjesečnih podataka za razdoblje 2004Q1–2024Q4 uspoređuju se zemlje s monetarnom autonomijom (Poljska, Češka, Mađarska) i članice europodručja (Slovenija, Slovačka, Estonija). Primjenjuju se SVAR modeli po pojedinim zemljama, a učinci se analiziraju pomoću ortogonaliziranih impulsnih odziva; robusnost rezultata provjerava se proširenim uzorkom i panel VAR pristupom. Rezultati upućuju na razlike među režimima: u zemljama s monetarnom autonomijom inflacija reagira snažnije i brže, dijelom zbog prijenosa tečajnih promjena. U europodručju su inflacijski učinci slabiji, ali su gubici proizvodnje izraženiji i dugotrajniji, uz poboljšanja tekućeg računa ponajprije zbog smanjene potražnje i uvoza. Nalazi ističu izazove monetarne unije: vjerodostojnost ECB-a ograničava inflaciju, ali smanjuje prostor za prilagodbu kroz monetarnu politiku.

Ključne riječi: Europski indeks neizvjesnosti, monetarna autonomija, proširenje europodručja, makroekonomske prilagodbe, šokovi neizvjesnosti, strukturni VAR model.

JEL klasifikacija: C32, E61, F15, F41, F45.