sciendo

DOI 10.2478/sbe-2025-0001
SBE no. 20(1) 2025

MONETARY POLICY RESPONSE DURING COVID-19 AND THE RUSSIA-UKRAINE WAR: EVIDENCE FROM EURO AND NON-EURO AREA

Florin ALIU
Faculty of Management, Business and Economics, University for Business and Technology, Kosovo

Albulena KASTRATI
Department of Economics and Finance, University of Central Missouri, USA

Yelyzaveta APANOVYCH
School of Expertness and Valuation, Institute of Technology and Business in Ceske Budejovice, Czech Republic

Abstract:

The outbreak of the COVID-19 pandemic activated the European Central Bank (ECB) to maintain financial stability. Two years later, the Russian-Ukraine war accelerated commodity prices and set inflation at unprecedented levels. The conflict in Ukraine once again tested the managerial capacities of the ECB and Non-Euro area central banks to control inflation. Considering these two non-economic shocks for the European economy, we analyze the monetary policy actions toward inflation and unemployment rate. The Panel Vector Autoregression (VAR) was used standing on the two-step generalized method of moments (GMM). The series covers the period from January 1, 2014, to August 1, 2023, through three independent panels. Panel A is the eurozone member states, Panel B the non-euro area, and Panel C the Scandinavian countries. The results show that Scandinavian and non-Eurozone countries have been much more effective in mitigating inflation than the ECB. The monetary policy in these countries had a significant influence on unemployment as well. On the other hand, the ECB has stayed within its mandate even during this period, targeting only inflation. The results interest policymakers in terms of monetary efficiency and response speed.

Key words: *Monetary response, European Central Bank, non-euro area, policy actions.*

1. Introduction

The European continent has been undergoing some of the most dramatic geopolitical and military threats since the end of World War II. The war in Ukraine, in addition to infrastructural destruction and human lives, placed the European financial system in cardiac arrest. The financial markets crashed while the foreign exchange rates (FX) were

under extraordinary pressure. The heavy reliance on Russian gas and oil was an extra concern for the EU member states. The study by Aliu et al., (2023) argues that Russian gas has been the primary source of the downturn in the European equity markets. The possibility that this war would reach the EU territory was evident. As a result, there was a significant capital shift to safe heaven places, mainly to the United States. Due to this fact and other motives, the Euro devalued against the US dollar. Another study by Aliu et al., (2020a) highlights that the Russian Ruble played the primary role in the Euro devaluation against US dollar. The Ruble is not among hard currencies, but its importance was amplified when the Russian president announced the "unfriendly list of countries". The countries in this list were obliged to make gas payments in Rubles, which regained its position within the FX. Due to this war, energy and food prices rose dramatically while the EU felt most of the adverse effects (Aliu et al, 2023a). Europe was the region most exposed to this invasion, as in addition to the accelerated food prices, it also had to deal with the humanitarian crisis. The war yielded numerous repercussions across EU and Western hemisphere. Imposing sanctions and restricting Russian oil and gas resulted in soaring energy prices, specifically electricity ones. Therefore, manufacturing companies faced higher input costs and workforce layouts (Eurofound, 2022). In short, the war in Ukraine diminished the global growth and raised security alarms. Notably, the energy dependence on the authoritarian regime can endanger financial system and the overall EU security.

During the 2008 global financial crisis (GFC), the COVID-19 pandemic, and the Russia-Ukraine war, monetary policy played a critical role in managing the slump. The 2008 financial meltdown set the pace for heavy intervention of central banks. The same actions were carried out after the outbreak of the COVID-19 and the war in Ukraine. The speed of monetary intervention was timely, learning the consequences of non-reaction from past shocks. The Lehman Brothers collapse was characterized by endemic financial instability, with a disinflationary state afterward (Rostagno et al., 2019). However, post-GFC for the world economy was a soft defense against the upcoming deflationary forces. The long-lasting financial consolidation and economic recuperation were interrupted by the unexpected and notorious COVID-19 pandemic. The coronavirus in 2020 disrupted worldwide supply chains and accelerated inflationary pressures (Bobeica and Hartwig, 2023). The first signs of rising inflation appeared close after the suspension of stringency measures (Blanchard and Ferry, 2022). The resurgence of inflation required central banks to become flexible and to shift monetary actions diametrically. More than 74 central banks worldwide justified higher policy rates as the primary instrument to mitigate inflation. The lockdown and other government actions sent the world economy into free fall while placed national budgets into austerity (Bajra et al., 2022). The monetary policy is expected to alleviate a demand shock, but the ECB was running out of instruments (EP, 2022). This occurred due to the prevalence of stagflation in Europe, where several member states suffered from soaring inflation and weak demand. Consequently, ECB and other non-euro central banks confronted the dilemma: increasing the rates at a potentially low cost. Considering the European context, we analyze the effectiveness of monetary policies covering the war in Ukraine and the COVID-19 pandemic. Recognizing the monetary differences (Euro and Non-Euro area), we investigate this issue through three different

panels. Panel A analyze the Eurozone member states, Panel B the non-Euro area, and Panel C the Scandinavian countries.

The Euro's inception in January 1999 has changed the Eurozone's importance in international financial system. On the other hand, inflation together with financial inefficiencies guided the European Central Bank (ECB) to undertake decisive monetary actions. In less than three months after the SARS-CoV-2 outbreak, the ECB unveiled a €750 billion stimulus package (Euractiv, 2022). The program involved purchasing government bonds and other asset classes to ensure liquidity within the system. Later, the ECB launched additional unconventional monetary interventions to boost economic activity and smooth inflation. Although in reality, fearing a stagnating economy and rising unemployment, the ECB introduced negative policy rates. The consecutive actions maintained clear performance implications for the banking industry (Kastrati, 2022). Banks were not convinced to lend by the same token that they received liquidity support from the ECB. Indeed, most of the stimulus remained as excess reserve liquidity within the banks' balance sheets (Ryan and Whelan, 2021). At that time, the resurgence of inflation in the EU was mainly due to the scarcities and cost-push factors (IMF, 2022). The rapid inflation that followed post COVID-19 made central banks realize that deflation is no longer a concern. The newly created situation feared authorities that, in the intermediate term, inflation would exceed ECBs targets (Brunnermeier, 2023). Factors that largely determined low inflation originate primarily from globalization, weak demand, low productivity, and permanent regulatory changes. In 2022, the US recorded the highest inflation rate in the last forty years reaching 8.9% (BLS, 2023), whereas the EU spiked high at 11% (Eurostat, 2023). The COVID-19 pandemic found Euro and Non-Euro areas with already stretched monetary policies and excess liquidity. External and unexpected shocks often limit the scope of monetary policy since effectiveness largely relies on fiscal actions as well.

The Russia-Ukraine war and the COVID-19 pandemic were unprecedented shocks for the EU economy. Both have unique origins (clearly not economic) but with substantial spillover volatilities on the financial system. The direct implications were seen in the acceleration of inflation and slump in the global growth (Caldara et al., 2022). Consequently, the intervention of the ECB was essential in maintaining a robust financial system but also inflation under target. Beukers (2013) investigates the forms of ECB intervention during economic shocks. The main risk identified for the ECB is being perceived as a political actor. Pronobis (2014) studied the monetary effects of the ECB's actions during the 2008/09 financial meltdown. They highlight that the ECB measures were more cautious than those of the Federal Reserve (FED) and the Bank of Japan (BoJ). A recent study by Mody and Nedeljkovic (2024) analyzes ECB policy during the eurozone crisis. According to the government bond spreads, the ECB's euro liquidity provisions and monetary stimulus had limited impact. Unlike the US, where the Fed has a dual mandate, the ECB focuses on only one objective– price stability. Since its inception, the EU has maintained diverse taxation, political arrangements, linguistic and cultural differences. This remains the beauty of this union, the policy success in such a unique and diverse environment. Recognizing these differences, we investigate policy rate transmission toward inflation and unemployment, covering COVID-19 and Russia-Ukraine war. The contribution of this paper is twofold. First, it provides insights into the speed and credibility of Eurozone monetary actions, non-Euro

area, and Scandinavian countries. Second, in addition to policy rate response, we document the effect it maintained on mitigating inflation and unemployment. In particular, it highlights if the policy rate has reacted to shocks in unemployment and inflation and if it has an evident implication. Scandinavian countries are part of the analysis primarily because of their well-proven institutional independence and low corruption (TR, 2023). These are crucial inputs for institutions like the central bank, where policy credibility relies mainly on its independence.

The rest of the paper is organized as follows. Section 2 contains two additional subsections, where subsection 2.1 specifies the model used while subsection 2.2 describes the data collection. Section 3 presents the estimated results and simultaneously discusses them. The final section brings paper conclusions and policy implications.

2. Methodology

The methodology is divided into two parts, where Section 2.1 specifies the model used, while Section 2.2 describes the data collection.

2.1. Model Specification

This study aims to analyze the impact of the policy rate on unemployment and inflation rates. The Panel VAR technique was applied, where all variables in the system are treated as endogenous. The model contains three panels: in Panel A, the member states of the Eurozone are treated; in Panel B, those of the non-eurozone; and in C, the Scandinavian countries. For this purpose, three panels have been created, each dealing with an identical problem in different EU regions. Panel A investigates the impact of policy rates on unemployment and inflation in the Eurozone, Panel B in the non-euro area, and Panel C on Scandinavian countries. Panel VAR stands on the traditional VAR model, recognizing unobserved individual heterogeneity. The Panel VAR model of the first-order stands as follows:

$$z_{it} = \Gamma_0 + \Gamma_{z_{it-1}} + f_i + d_{c,t} + e_t \quad (1)$$

Where z_t, in our case, is three vector variables (*Unm*, *Inf*, *Pr)*. The *Unm* indicates the unemployment rate, *Inf* for the inflation rate based on the consumer price index, and *Pr* for the policy rate. The same inputs are used in three independent panels (A, B, and C). Before performing Panel VAR, the inputs in the system must pass the unit root tests. To verify stationarity of the series, augmented Dickey–Fuller test (ADF) tests, Phillips–Perron (PP) test, and Kwiatkowski–Phillips–Schmidt–Shin (KPSS) tests were performed. The results are served through the regression table, general/orthogonal impulse response function (*Girf/Oirf*), and forecast error variance decomposition (*Fvrd*). The impulse response function analyzes one variable's response (shocks) to another, keeping all others constant. The confidence interval of *Girf*/*Oirf* is generated through Monte Carlo simulations with 50 trials.

Since the covariance matrix of the errors is less likely to be diagonal, in that case, the inputs in the system must become orthogonal. Therefore, the order of the variables is essential, where the first variables in the system affect all the others. Those that appear first in the ranking tend to be more exogenous, while those at the end are more endogenous. The *Fvrd* examines, over time, the percent variation of one input due to the shock from another input. At the same time, determining the number of lags in the Panel VAR system is particularly important. The number of lags (L) is determined through these information criteria, such as the Akaike information criterion (AIC), Hannan-Quinn (HQ), Schwarz Criterion (SC), Akaike's Final Prediction Error (FPE). In order to apply VAR in panel data, it is required to set restrictions in the system. These restrictions are achieved by allowing individual "heterogeneity" of variables through imposing fixed effect (denoted as f_i). Due to the use of lags in the system, fixed effects are likely correlated with the regressors. To eliminate this problem, mean-differencing is used, known as the "Helmert procedure."

2.2. Data

This study investigates the policy rate (Pr) response toward unemployment (Unm) and inflation (Inf). The analysis is divided into three parts: Eurozone is treated in Panel A, non-Eurozone in Panel B, and Scandinavian countries in Panel C. The three panels (A, B, and C) are balanced since each country holds an equal number of observations. Data related to inflation and unemployment rates are collected from the World Bank Open Data (WBOD, 2023), while those related to the policy rate from the European Central Bank (ECB, 2023). The monthly series represents the period from January 1, 2014, to August 1, 2023. Table 1 shows descriptive statistics where Panel A holds the most significant observations. However, Table A.2 in the appendix provides an exact overview of the content of each panel. On average, Unm has been lowest in the non-Euro area (5.65%), followed by the Scandinavian (6.33%) countries and the Eurozone area (8.32%). The non-Euro area, on average, has had the highest level of inflation of 2.99% and, concurrently, the highest policy rate (0.97%). At the same time, the Pr in Panel A has maintained the highest standard deviation (Sd) compared to the other two panels. In short, non-Eurozone countries have simultaneously been flexible in mitigating inflation and economic growth. The unit root tests are generated through augmented Dickey–Fuller test (ADF) tests, Phillips–Perron (PP), and Kwiatkowski–Phillips–Schmidt–Shin (KPSS) tests. The p-value of ADF, PP, and KPSS shows that the data are stationary at the level.

Table A.2 in the appendix highlights the distribution of given frequencies related to the three independent panels. The Inf data for Eurozone and non-Eurozone countries lie between -1% and 4%. The Inf series for Scandinavian countries stands mainly between 0% and 2%. The Pr frequency distribution for the Eurozone series stands mainly between 0% and 0.5%, while for the non-Eurozone, it is between -1% and 2%. Overall, non-eurozone central banks have been much more sensitive to changes in the real economy.

Table 1. Summary statistics

	N	Mean	Sd	Median	Min	Max	Skew	Kurtosis	ADF	PP	KPSS
Panel A (Eurozone)											
Unm	2052	8.32	4.61	6.9	2.6	29.3	1.79	3.47	0.01	0.01	0.1
Inf	2052	2.41	3.88	1.2	-2.9	25.2	2.49	7.49	0.01	0.01	0.1
Pr	2052	0.25	0.76	0.0	0.0	3.75	3.61	11.9	0.01	0.01	0.1
Panel B (non-Eurozone)											
Unm	912	5.65	2.25	5.4	1.7	14.3	0.63	0.10	0.01	0.01	0.1
Inf	912	2.99	4.28	1.7	-2.5	26.2	2.45	6.95	0.01	0.01	0.06
Pr	912	0.97	1.96	0.1	-0.5	13.0	3.65	16.5	0.01	0.01	0.08
Panel C (Scandinavian)											
Unm	456	6.33	1.85	6.4	2.6	11.7	0.27	-0.64	0.03	0.03	0.1
Inf	456	2.29	2.53	1.4	-0.7	11.4	1.63	1.87	0.01	0.01	0.1
Pr	456	0.35	0.82	0.0	-0.4	4.0	2.09	4.22	0.04	0.02	0.1

Note: This table shows descriptive statistics based on level data covering January 1, 2014, to August 1, 2023. Panel A indicates Eurozone countries, Panel B is the non-Eurozone, and Panel C is the Scandinavian countries. In each panel, Unm presents the unemployment rate, Inf the inflation rate, and Pr the policy rate. In addition to standard indicators such as the number of observations (N), mean, standard deviation (Sd), minimum (Min), maximum (Max), skewness (Skew), and kurtosis, the table also contains unit root tests. The stationary tests are performed using augmented Dickey–Fuller test (ADF) tests, Phillips–Perron (PP), and Kwiatkowski–Phillips–Schmidt–Shin (KPSS) tests. In the case of ADF and PP, the p-value must be less than 5% significance level, while for KPSS, it must be greater than 5%.

3. Results

This paper examines the impact of policy rates on unemployment and inflation using the Panel VAR technique. The analysis is carried out through three panels: Panel A stands for the eurozone member states, Panel B for the non-euro area, and Panel C for the Scandinavian countries. The Panel VAR findings originate from regression outcomes, impulse response function (*Girf*/*Oirf*), and forecast error variance decomposition (*Fvrd*). Table 4 presents *Fvrd* estimation for the three panels covering the period from January 1, 2014, to August 1, 2023. Panel A findings stand on nineteen eurozone member states for the ten periods ahead. Considering the period under study, the policy rate in the eurozone countries (Panel A) reacts to inflation and not the unemployment rate. The influence of *Inf* on *Pr* starts at 12.1% and ends at 17.9% in the tenth month. Despite the two significant non-economic shocks (COVID-19 and the Russia-Ukraine war), the ECB has remained within its mandate. However, unemployment remains an additional concern that eurozone member states must address independently. Inflation in the euro area has been mainly within the ECB's target, except for its explosion during the Russian invasion of Ukraine. The fact that

Pr has not absorbed significant shocks from *Inf* might be related with moderate inflation in the Eurozone till 2022.[1]

Table 4. Forecast error variance decomposition (*Fvrd*) for three independent panels

Ford (Panel A)			
Periods ahead	*Unm*	*Inf*	*Pr*
[1]	0.021	0.126	0.852
[2]	0.016	0.159	0.823
[3]	0.012	0.164	0.824
[4]	0.009	0.171	0.819
[5]	0.007	0.173	0.818
[6]	0.005	0.175	0.818
[7]	0.004	0.176	0.819
[8]	0.003	0.177	0.819
[9]	0.003	0.178	0.819
[10]	0.002	0.179	0.819
Ford (Panel B)			
Periods ahead	*Unm*	*Inf*	*Pr*
[1]	0.731	0.107	0.160
[2]	0.689	0.143	0.167
[3]	0.658	0.173	0.168
[4]	0.641	0.194	0.164
[5]	0.635	0.206	0.158
[6]	0.636	0.210	0.153
[7]	0.641	0.211	0.148
[8]	0.646	0.210	0.146
[9]	0.652	0.207	0.147
[10]	0.657	0.193	0.149
Ford (Panel C)			
Periods ahead	*Unm*	*Inf*	*Pr*
[1]	0.231	0.042	0.726
[2]	0.241	0.136	0.622
[3]	0.341	0.196	0.462
[4]	0.374	0.216	0.408
[5]	0.361	0.224	0.414
[6]	0.355	0.227	0.437
[7]	0.316	0.229	0.456
[8]	0.311	0.224	0.463
[9]	0.318	0.220	0.461
[10]	0.329	0.215	0.454

Note: This table indicates the results of Panels A, B, and C based on forecast error variance decomposition (*Fvrd*). The data covers the period from January 1, 2014, to August 1, 2023, with monthly frequencies. The *Fvrd* is performed using one lag in the system and for the ten periods ahead (ten months ahead). The results show the

[1] The *Fvrd* results for the three Panels (A, B, and C) related to the reaction of *Inf* and *Unm* against *Pr* are available on request. In the case of Panel A, *Irf* and *Unm* react to changes in *Pr* on average with 20% and 28%, respectively. In summary, the policy rate of the ECB has been effective in mitigating inflation, but at the same time, it has a moderate impact on unemployment. So, the *Pr* changes within the Eurzone have only targeted bringing inflation below 2%. The *Fvrd* estimated results are also confirmed through the Generalized/Orthogonal impulse response function.

reaction of the policy rate (*Pr*) to unemployment (*Unm*) and inflation (*Inf*) rate. The calculated results are prepared in R studio through the "panelvar" package and the "fevd_orthogonal" function—*source*: Authors' elaboration.

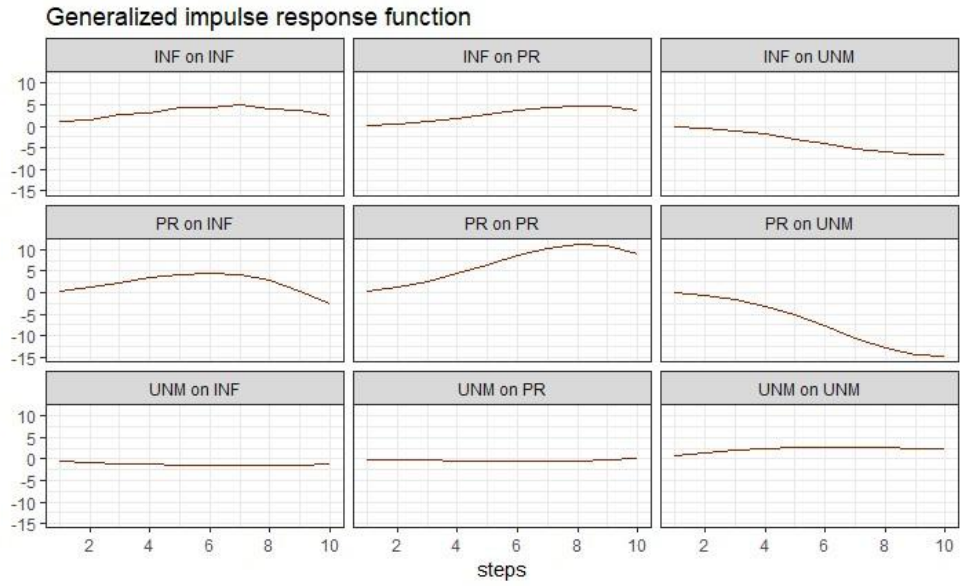
Panel B contains *Fvrd* findings of eight non-eurozone countries that maintain their monetary policies. Compared to the ECB, the central banks of non-euro areas, in addition to inflation, also target unemployment problems. Additionally, *Pr* in these countries has been more sensitive to *Unm* (between 73.1% and 65.7%) and less to *Inf* (between 10.7% and 19.3%). Although in the mandate of all non-euro area central banks, inflation is their primary objective[1], but in reality, they have targeted unemployment as well. This is because inflation in these countries has been within the mandate, leaving room for central banks to fight unemployment.[2] In Panel C, we have the Scandinavian countries where the policy rate (*Pr*) has targeted *Inf* and *Unm* simultaneously. However, the significant part of *Pr* changes (considering the three panels) comes from its lags. In this context, the board's past decisions affect the current decisions, so *Pr* actions maintains continuity and sustainability. Our findings, in line with Beukers (2013), Pronobis (2014), and Mody and Nedeljkovic (2024), highlight the inadequacy of the European Central Bank's effectiveness, a reality that must always be contextualized. The Eurozone, functioning as a single monetary unit, grapples with a lack of political and fiscal unity. Its member countries, each with their unique tax systems and labor markets, contribute to the complexity. Furthermore, the countries' varying debt levels and stages of development underscore the need for a nuanced approach, as these factors pose challenges to the ECB's monetary policy effectiveness.

Figure 1 estimates *Girf*'s results based on 95% confidence for the eurozone member states. The findings align with those of the *Fvrd* but also indicate the magnitude and direction of the influence. It can be noted that *Pr* affects the rate of inflation and unemployment simultaneously. So, the increase (positive shock) in *Pr* gives the effect of reducing inflation in the Eurozone after six months. The process takes time as banks adjust their expectations, lending and borrowing costs. The *Girf* estimations show that *Inf* reacts to *Pr* changes as well, indicating the monetary policy's effectiveness. To this end, apart from ECB targeting *Inf*, it has also been effective in mitigating it.

[1] This can be verified from the official websites of seven non-eurozone central banks (such as the Czech, Polish, Hungarian, Danish, Swedish, Bulgarian, and Romanian central banks).

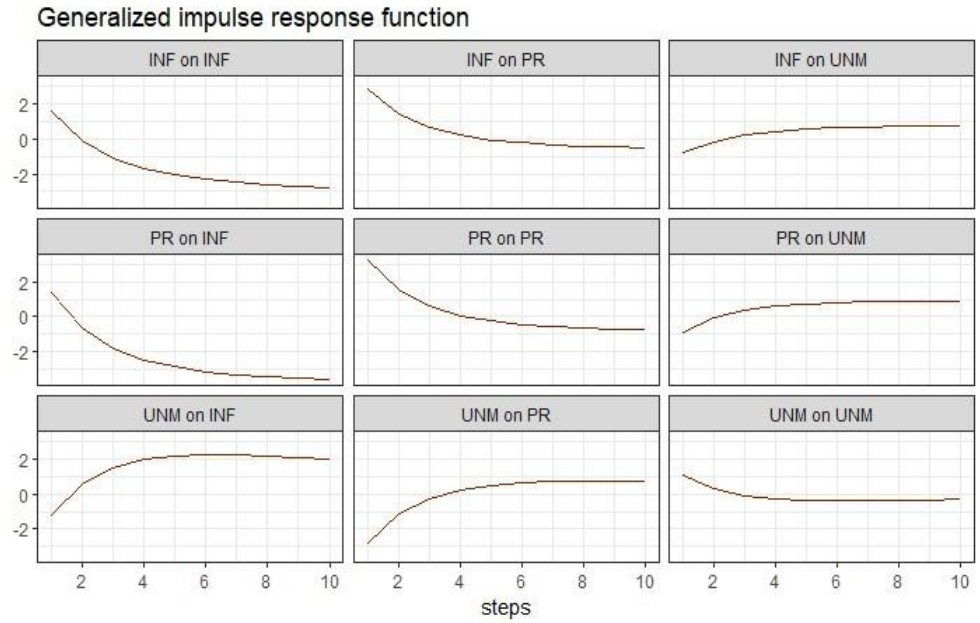
[2] The Panel B and C estimations, showing the reaction of *Inf* and *Unm* against *Pr*, are available on request. In the non-euro area, movements in *Inf* have been influenced by *Pr* at 48% on average. However, on average, the *Unm* changes were influenced by the central bank's policy rate (*Pr*) at 43%. The results indicate that non-euro central banks have been more effective than the ECB in mitigating inflationary pressures and reducing the unemployment rate.

Figure 1. Generalized impulse response function for Panel A



Note: This figure maintains estimates from the generalized impulse response function (*Girf*) for the euro area, named Panel A. The logarithmic data stand in monthly frequency and cover the period from January 1, 2014, to August 1, 2023. The confidence band of PVAR impulse response function was estimated based on "GIRF" type irf, ten months ahead, at 95% confidence band, and fifty trials—*source:* Authors' elaboration.

Figure 2. Generalized impulse response function for Panel B



Note: The figure highlights the generalized impulse response function (*Girf*) for the non-eurozone countries (Panel B). The Panel is based on eight EU countries that maintain their national currencies. The monthly data cover the period from January 1, 2014, to August 1, 2023. The *Girf* was estimated based on "GIRF" type irf, for ten months ahead, at a 95% confidence band, and with fifty number of trials—*source:* Authors' elaboration.

Figure 2 shows the nine *Girf* plots for non-euro-zone countries constrained with a 95% confidence band. As with Panel A, the *Pr* in Panel B is largely affected by its lags, but also *Inf* and *Unm*. Contrary to the ECB, the central banks of the non-Eurozone countries have been much more effective in fighting *Unm* and *Inf* pressures. The positive shock (increase) in *Pr* starts to cool inflationary problems in nearly two months ahead. As expected, the positive shock in *P*R causes an increase in unemployment as financing business activities becomes more costly. Furthermore, higher *Pr* generally tightens lending activities toward the real economy. In summary, central banks of non-euro are much more attentive to the changes that occur in the labor market than the ECB. Basically, the increase of Pr by 1 pct reduced the inflation by 2.5 pct in a period of six months. Staying within the same time interval, 1 pct positive shock of Pr increased unemployment by almost 0.8 pct.

Figure A.1 in the appendix indicates *Girf* estimations for the four Scandinavian countries (Sweden, Norway, Finland, and Denmark). Compared to Panels A and B, the increase of *Pr* in Panel C significantly decreases *Inf*. The central banks in the Scandinavian countries are much more effective in fighting inflation than the Eurozone and non-eurozone areas. The 1 pct positive shock in *Pr* declines *Inf* for almost 1 pct within three month. This could be due to the central banks' credibility, the monetary policy's efficacy, or the institution's credibility. Scandinavian countries also have the lowest level of corruption based on Transparency International (TI, 2023), which stands as an additional element in this process. Table A.1 presents Panel VAR regression estimates with a two-step Generalized method of moments (GMM). Once again, these estimates confirm that the central banks of the Scandinavian countries and those of the non-euro area are more efficient in cooling inflation and fighting unemployment. Positive shock in PR does not cause an increase in unemployment and this could be for different reasons. First, it can be related to the safety net policies that these countries have. Second, it may have to do with labor force productivity, which is mainly related to fairly efficient education system. According to the Program for International Student Assessment (PISA, 2023), the Nordic countries always lead in terms of the quality of education. These and many other circumstantial facts make unemployment not dependent on monetary policy.

4. Conclusion

This study investigates the influence of monetary policy on the inflation and unemployment rate in the European Union. The outbreak of COVID-19, followed by the Russia-Ukraine war, sent the European financial system into cardiac arrest. On top of the health and economic crisis, Europe was shocked by the War in Ukraine. The EU during this period experienced low growth and inflation beyond the official targets. For this purpose, we have analyzed the effects of monetary policy response through three independent panels. Panel A deals with eurozone member states, Panel B with non-euro area, and Panel C with Scandinavian countries. The results show that the central banks of non-Euro area and Scandinavia have been much more effective in mitigating inflation compared to the ECB. At the same time, the monetary policy of these countries has significantly influenced unemployment problems. On the contrary, the ECB has only mitigated inflation (not unemployment) but not with satisfactory results in cooling it. In the Eurozone, higher policy

rates affect inflation pressures only after six months. Conversely, in the non-euro area and the Scandinavian countries, the effects of policy rates on inflation are felt after three months. This shows that the speed of the reaction is also different, representing an essential dimension in the efficiency of the monetary policy.

The ECB's lack of efficiency in mitigating inflation during this period might be due to various factors. First, the eurozone member countries are at different stages of development but also with institutions differences. Second, despite the common currency, they maintain diverse taxing environment, budgetary systems and unique political arrangements. Third, financial development (where, in some countries, capital markets are fragile) could be an additional drawback for inefficient transmission. The findings provide signals not only for central banks but also for national governments. Due to limited budget capacities, governments must refrain from intervening in the economy during crises. Therefore, boosting economic activity (reducing unemployment) through monetary actions might be a reliable tool.

5. References

Aliu, F., Hašková, S., & Bajra, U. Q. (2023). Consequences of Russian invasion on Ukraine: evidence from foreign exchange rates. *The Journal of Risk Finance*, *24*(1), 40-58. DOI: 10.1108/JRF-05-2022-0127

Aliu, F., Kučera, J., & Hašková, S. (2023a). Agricultural Commodities in the Context of the Russia-Ukraine War: Evidence from Corn, Wheat, Barley, and Sunflower Oil. Forecasting, 5(1), 351-373. DOI: 10.3390/forecast5010019

Aliu, F., Mulaj, I., & Hašková, S. (2023). Consequences of the Russia-Ukraine war: evidence from DAX, ATX, and FTSEMIB. *Studies in Economics and Finance*, *40*(3), 549-568. DOI: 10.1108/SEF-12-2022-0555

Bajra, U. Q., Aliu, F., Aver, B., & Čadež, S. (2023). COVID-19 pandemic–related policy stringency and economic decline: was it really inevitable? *Economic research-Ekonomska istraživanja*, *36*(1), 499-515. DOI: 10.1080/1331677X.2022.2077792

Beukers, T. (2013). The new ECB and its relationship with the Eurozone Member State: between central bank independence and central bank intervention. Common Market Law Review, 50(6). DOI:10.54648/cola2013160

Blanchard, O., & Pisani-Ferry, J. (2022). Fiscal support and monetary vigilance: economic policy implications of the Russia-Ukraine war for the European Union (No. 06/2022). Bruegel Policy Contribution.

Bobeica, E., & Hartwig, B. (2023). The COVID-19 shock and challenges for inflation modelling. International journal of forecasting, 39(1), 519-539. DOI: 10.1016/j.ijforecast.2022.01.002

Brunnermeier, Markus, K. (2023). "Policy in a Changing World." Finance and Development. 60(1), 4-9. https://www.imf.org/en/Publications/fandd/issues/2023/03/rethinking-monetary-policy-in-a-changing-world-brunnermeier.

Bureau of Labor Statistics BLS. (2023). 12-month percentage change, Consumer Price Index, selected categories. Available at: https://www.bls.gov/charts/consumer-price-index/consumer-price-index-by-category-line-chart.htm (Accessed on 18 October 2023).

Caldara, D., Conlisk, S., Iacoviello, M., & Penn, M. (2022). The effect of the war in Ukraine on global activity and inflation. FED Notes. Available at: https://www.federalreserve.gov/econres/notes/feds-notes/the-effect-of-the-war-in-ukraine-on-global-activity-and-inflation-20220527.html

Euroactiv (2022). ECB unveils €750 billion stimulus against coronavirus. Available at: https://www.euractiv.com/section/coronavirus/news/ecb-unveils-e750-billion-stimulus-against-coronavirus/. (Accessed on 18 October 2023).

Euroactiv (2022). ECB unveils €750 billion stimulus against coronavirus. Available at: https://www.euractiv.com/section/coronavirus/news/ecb-unveils-e750-billion-stimulus-against-coronavirus/. (Accessed on 18 October 2023).

Eurofound (2022). First impacts of the Ukrainian crisis on employment in the EU. Employment and labour markets. Available at: https://www.eurofound.europa.eu/en/resources/article/2022/first-impacts-ukrainian-crisis-employment-eu#:~:text=One%20consequence%20of%20the%20war,adjust%20production%20and%20employment%20levels. (Accessed on 18 October 2023).

European Central Bank ECB (2023). Key ECB interest rates. Available at: https://www.ecb.europa.eu/stats/policy_and_exchange_rates/key_ecb_interest_rates/html/index.en.html(Accessed on 18 October 2023).

European Parliament EP (2022). Monetary policy issues in the context of the war in Ukraine. Policy Department for Economic, Scientific and Quality of Life Policies, available at: https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/703361/IPOL_BRI(2022)703361_EN.pdf/ (Accessed on 18 October 2023).

Eurostat (2022). Annual inflation down to 10.1% in the euro area. Accessible at: https://ec.europa.eu/eurostat/documents/2995521/15701156/2-16122022-AP-EN.pdf/4eaa941a-8c7d-af89-37da-f29f1167c24c#:~:text=European%20Union%20annual%20inflation%20was,%25)%20and%20Malta%20(7.2%25)

International Monetary Fund (IMF) Blog (2022). Supply Disruptions Add to Inflation, Undermine Recovery in Europe. Avaliable at: https://www.imf.org/en/Blogs/Articles/2022/02/17/blog-supply-disruptions-add-to-inflation-undermine-recovery-in-europe

Kastrati, A. (2022). Paradox of excess liquidity in European emerging and transition economies. Prague Economic Papers, 31(1), 79-114. DOI: 10.18267/j.pep.793

Mody, A., & Nedeljkovic, M. (2024). Central bank policies and financial markets: Lessons from the euro crisis. Journal of Banking & Finance, 158, 107033. DOI: 10.1016/j.jbankfin.2023.107033

Program for International Student Assessment-PISA (2023). PISA scores by country. Available at: https://worldpopulationreview.com/country-rankings/pisa-scores-by-country. (Accessed on 18 October 2023).

Pronobis, M. (2014). Is monetary policy of ECB the right response to the Eurozone crisis?. Procedia-Social and Behavioral Sciences, 156, 398-403. DOI: 10.1016/j.sbspro.2014.11.210

Rostagno, M., Altavilla, C., Carboni, G., Lemke, W., Motto, R., Guilhem, A. S., & Yiangou, J. (2019). A tale of two decades: the ECB's monetary policy at 20. DOI: 10.2139/ssrn.3515400

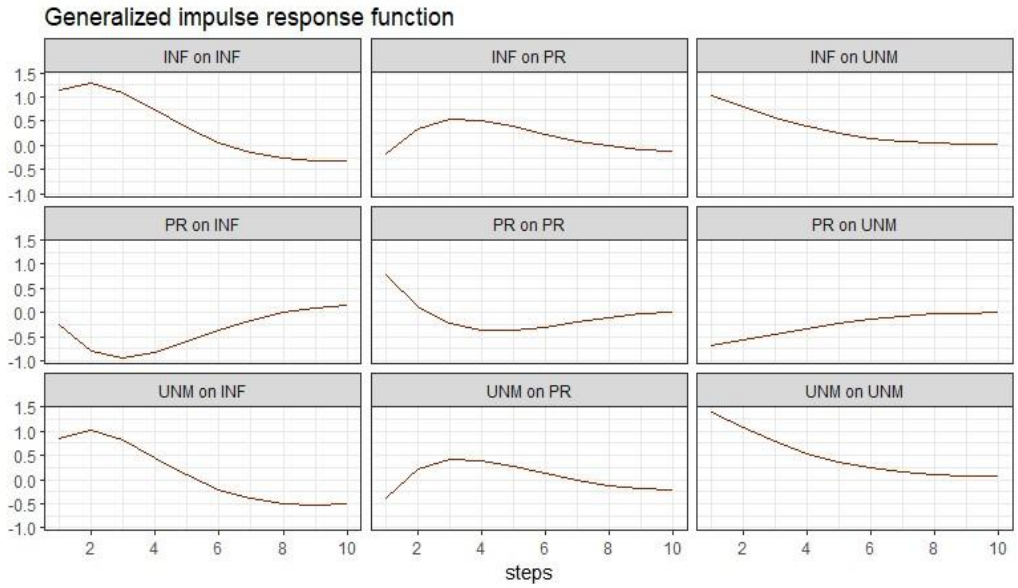
Ryan, E., & Whelan, K. (2021). Quantitative easing and the hot potato effect: Evidence from euro area banks. Journal of International Money and Finance, 115, 102354. DOI: 10.1016/j.jimonfin.2021.102354Get rights and content

The World Bank Open Data WBOD (2023). Data Bank – Explore Data. Available at: https://databank.worldbank.org/databases. (Accessed on 18 October 2023).

Transparence International TR (2023). Corruption Perceptions Index. Available at: https://www.transparency.org/en/cpi/2022?gclid=EAIaIQobChMI38az4dyBggMVGQmLCh1DxgSlEAAYASAAEgIV2PD_BwE. (Accessed on 18 October 2023).

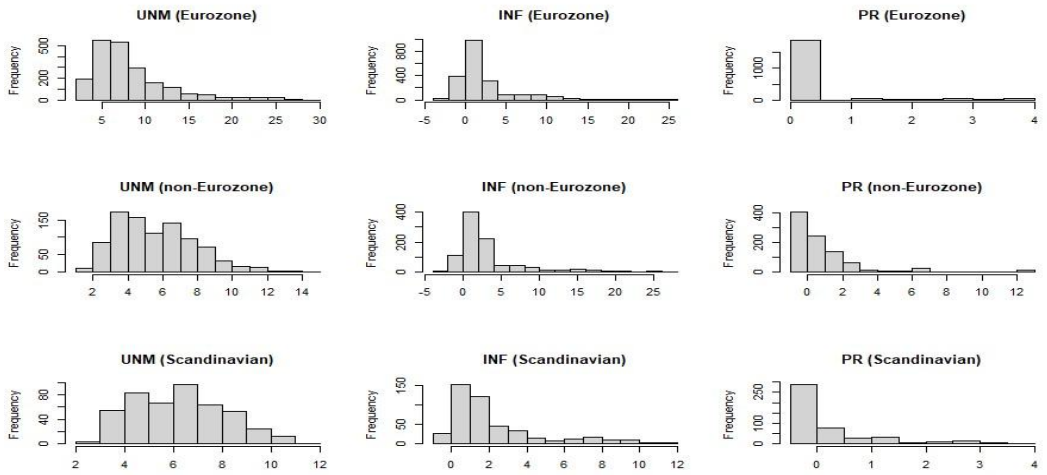
Appendix

Figure A.1. Generalized impulse response function for Panel C



Note: The figure contains the generalized impulse response function (GIRF) for four Scandinavian countries (Finland, Norway, Sweden, and Denmark). However, three of them, Sweden, Norway, and Denmark, have their national currencies, while Finland is part of the Eurozone. The Panel stands with monthly frequencies and covers the period from January 1, 2014, to August 1, 2023. The *Girf* plots are based on the 95% confidence interval for the subsequent ten periods and constrained with fifty simulation trials—*source:* Authors' elaboration.

Figure A.2. The histogram of the given data for the three different panels



Note: this figure presents a histogram for the variables (*Unm*, *Inf*, and *Pr*) of the three separate panels. The data are monthly and cover the period from January 1, 2014 to August 1, 2023. Plots are generated in the R studio through the "tidyverse" package and the "hist" function.

Table A.1. Dynamic Panel VAR regression, two-step GMM

Panel A			
	Unm	*Inf*	*Pr*
Lag1_Unm	0.9737***	0.0022	0.0165
	(0.0012)	*(0.0152)*	*(0.0383)*
Lag1_Inf	-0.0005	1.0425***	0.0308**
	(0.0099)	*(0.0184)*	*(0.0371)*
Lag1_Pr	-0.0137	-0.4779***	1.0226***
	(0.0315)	*(0.1040)*	*(0.0959)*
Const.	-0.0799	0.0923	0.5155
	(1.3379)	*(2.6148)*	*(7.2168)*
Panel B			
	Unm	*Inf*	*Pr*
Lag1_Unm	0.7890***	0.2971	0.0618*
	(0.0843)	*(0.2042)*	*(0.0388)*
Lag1_Inf	-0.1005**	1.2213***	0.0112
	(0.0341)	*(0.1088)*	*(0.0520)*
Lag1_Pr	0.2310*	-0.6312*	0.0091
	(0.0942)	*(0.2797)*	*(0.0059)*
Const.	0.0518***	0.0130***	0.0020
	(0.0099)	*(0.0036)*	*(0.0064*)
Panel C			
	Unm	*Inf*	*Pr*
Lag1_Unm	0.7295***	-0.2207***	0.0398**
	(0.1160)	*(0.0250)*	*(0.0132)*
Lag1_Inf	0.0220	1.2008***	0.3087***
	(0.0289)	*(0.0671)*	*(0.0299)*
Lag1_Pr	-0.1093***	-0.8344***	0.2872***
	(0.0206)	*(0.19488)*	*(0.0288)*
Const.	0.0082***	-0.0044***	0.0015***
	(0.0006)	*(0.0251)*	*(0.0002*)

Note: This table indicates estimated coefficients and standard errors related to Panel VAR regression results. Panel A deals with euro area member states, Panel B with non-euro area, and Panel C with four Scandinavian countries. The data pass the unit root tests at the level (I0) and cover the period from January 1, 2016, to August 1, 2023. The Panel VAR regression is performed considering one lag in the system and based on logarithmic data. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively—*source:* Authors' elaboration.