THE ROLE OF THE MONETARY POLICY IN STABILIZING INFLATION IN THE EUROPEAN MONETARY UNION DURING THE ENERGY CRISIS

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Abstract: *Monetary policy, together with fiscal policy, are key policies in stabilizing economies from shocks that come from offers and demands. The monetary policy, with the application of its instruments and channels of transmission, among other things, aims to maintain a stable level of prices, that is, a low level of inflation by permanently creating targeted measures and establishing a target corridor in which inflation should move towards. The emergence of the Corona crisis in 2020 indirectly through the governments' health care measures, which included the ban on movement, implied the disruption of global supply chains, the reduction of aggregate demand, and the depletion of state budgets, in addition to this, the beginning of the Russian-Ukrainian conflict and the imposition of sanctions on banning trading in Russian oil and gas on the world stock exchanges caused a rapid increase in the prices of energy in Europe, this reflected in the prices of almost all products and services, and the same resulted in a characteristically high or double-digit inflation rate within the Eurozone. The subject of the research is the analysis of the role of monetary policy in the stabilization of inflation in the Eurozone through monetary measures, instruments of the European Central Bank and transmission channels. The scientific goal of the research is to examine the impact of monetary measures on the stabilization of inflation in the Eurozone by applying a theoretical-methodological basis and quantitative analysis. From the research it can be concluded that with a high inflation rate, the monetary policy has a significant role in creating policies and measures for stabilization and reduction of inflation precisely because a significant correlation has been identified between inflation and the variables that can be affected by monetary measures, it can also be concluded that the Eurozone, even though known as a complicated optimal currency area due to the fact that different countries are in different business cycles, the ECB's measures had a stabilizing role and contribute to the reduction of inflation and macroeconomic stability as a whole.*

Key words: *Inflation, monetary policy, ECB, Eurozone, stabilization.*

JEL classification: *E50, E52, E58.*

1. INTRODUCTION

The financial crisis in 2008 as one of the largest global financial crises, was a prerequisite for reforming the existing financial systems and establishing mechanisms for stability in the domain of the fiscal and monetary policy. Thus, the emergence of the Corona crisis in 2020, indirectly had a significant negative impact on financial flows, therefore testing the resilience of economies from financial shocks. Although a large number of economists believed that the economies would be resistant and capable to cope with the shock, which in this case came from side of the

supplies, that were caused by the measures taken by the governments, which were aimed at limiting movement which contributed to the reduction of production and overall economic activity, disruption of global supply chains and the allocation of large budget funds to maintain the economy and the standard of the population, practice has shown that the same, especially in the European economy, have a high degree of volatility (Калинова & Сидорова, 2022).

Even though a great part of the analysis showed a post-covid economic recovery, the beginning of the Russian special military operation in Ukraine primarily signaled the beginning of the so-called global conflict and destabilization of the overall economic order in which trade and prices have a central place (Ozili & Ozen, 2022). Namely, the beginning of the operation from a political point of view marked the beginning of the creation and introduction of economic sanctions from the EU towards the Russian Federation, among which the most comprehensive were the sanctions that referred to the ban on the import of Russian energy into the EU, through the economic perspective, this marked the beginning of the growth of the prices of oil and gas and oil derivatives on the world stock markets and the decline of the economic growth of Europe which was based on the cheap Russian oil. The enormous growth in energy prices, which have the treatment of basic raw materials for gross products and services, created a growth in the prices of finished products and rapid growth of inflation within the framework of the European Monetary Union (Xin, 2022).

Inflation in the Eurozone began to grow even before the start of the special operation, that is, with the beginning of global tensions in the month of July 2021 reaching the highest level of 10.6% in the month of October 2022. In order to deal with the high rate of inflation and its negative effects on the European economy and population, the ECB had started a process of monetary adjustment of the situation and creating measures that, through transmission mechanisms of the monetary policy will affect the reduction of inflation, and in medium term, full macroeconomic stability. As an initial response to the growth of inflation, the ECB increased the reference interest rate, which is actually a basic measure in such situations, consequently the transmission channels showed that the measure had a positive effect, as loans from companies and the population were reduced, and the lenders became extra cautious (de Guindos, 2024). What is characteristic in the monetary policy in the EMU, is that different business cycles appear in different countries, similarly, which is very complex for the ECB to harmonize and create a policy that will be suitable for all members of the union (Popović, 2024).

The subject of research in this paper is the role of monetary policy in dealing with inflation within the Eurozone, which arose after the beginning of the Russian-Ukrainian conflict, that is, an analysis of the measures taken by the ECB as a response to increase in prices and the overall macroeconomic destabilization. The scientific goal of the paper is to evaluate the impact of the measures on inflation by applying a theoretical-methodological bases and a quantitative analysis of the variables that have a role in the increase of inflation and the measures to reduce it.

The research paper is composed of two parts: 1) the theoretical part, which includes an overview of research results related to this problem and 2) an empirical part, which refers to the analysis of the correlation between inflation of one and some variables which have the treatment of ECB measures and can affect the reduction and stabilization of inflation on the other hand.

2. THEORETICAL BACKGROUND

The disruption of global supply chains especially in the domain of the supply of raw materials and production materials and the enormous growth in energy prices, especially the increase of the price of BRENT oil and liquefied petroleum gas (LPG) implied a rapid growth in inflation, consequently, according to the ECB, 2/3 of the inflation growth was due to the growth of energy and food prices (Lagarde, 2023).

In addition to what the governor of the ECB claims, and a large number of economists, including van't Klooster, believe that the increase in the price of energy as basic raw materials for production has a leading role for the increase of prices and the growth of inflation in the Eurozone. From this, it can be concluded that the growth of inflation, that is, the price shock comes from the supplier (van't Klooster, 2022).

Although the economists from the so-called West believed that the sanctions introduced against the Russian Federation, which refer to trade and financial flows and the ban on the import and use of raw materials, materials, semi-finished products and finished products, will have negative economic effects only for the Russian economy, the governor of the Bank of Spain pointed out the opposite, that is, that the sanctions introduced by the EU have a large share on the growth of inflation in the Eurozone (Hernandez de Cos, 2022).

What is characteristic is that during the Covid crisis and the financial measures taken by the governments in order to maintain the standard of the population, placed a significant amount of money in circulation in the national economies, while according to the quantitative theory of money of the economists Fisher and Brown (Fisher & Gunnison Brown, 1911) the placement of an additional amount of money in circulation causes an increase in prices, that is a rise in inflation.

The emergence of inflation in the Eurozone and its consequences within the domain of the economy as a whole caused the ECB to introduce measures aimed at dealing with inflation and returning it within the frame of 2% of the average annual inflation rate. Namely, the growth of inflation, which repeatedly breached the target inflation rate, not only within the Eurozone, but also in other regions of Europe that are not part of the Eurozone, regulated for a tightening of the monetary policy, mostly with an increase in the reference interest rate, which aimed to reduce the loans from the banks to the debtors, and thereby indirectly contribute to the reduction of economic activities and investments which, according to the basic economic logic, have a positive impact on the growth of inflation (FinlandBank, 2023).

A large number of researches in the domain of this problem indicate that the strict monetary policy, in addition to the impact on the amount of credit placements, had a great impact on the financial markets, whereupon the increase in the interest rate was indirectly affected, in the short term, the exchange rate and EU trade and the USA in such a way that the Euro on one hand notes a significant devaluation in relation to the US Dollar, which implies an additional increase in the price of imports of American products and raw materials, up front energies of American origin, and on the other hand, the economy within the Eurozone recorded a slowdown precisely because of the increase in the cost of credits and the unpredictability of the movement of monetary policy (Ilzetzki & Jain, 2023).

3. RESERACH METHODOLOGY

The research was done using secondary data published by relevant institutions, when choosing a data source, several criteria were taken into account: 1) the institution that published the data, 2) the date of publication, and 3) the degree of contribution of the data in increasing the quality of the research results.

The research is composed of: 1) descriptive statistics of the variables and 2) correlation analysis of the variables and regression analysis of inflation, M1 and the Euro/Dollar exchange rate (OLS method).

The research refers to the period from July 2022 till September 2023

Variable	Type	Abbreviation	Source
Average monthly inflation rate in the Eurozone	Dependant	HIPC	ECB
Monthly amount of monetary aggregate M1	Independent	M1EU	ECB
Deposit Facility	/	DEFA	ECB
Fixed Rate Tender	/	FIRT	ECB
Marginal Lending	/	MALE	ECB
Average monthly exchange rate Euro/Dollar	Independent	EXRA	ECB

Hypotheses:

- ❖ **H1:** There is a significant correlation between the average monthly inflation rate in the Eurozone and the other variables;
- ❖ **H2:** The independent variables in the regression have a significant impact on inflation in the Eurozone;
  H2.1: Monetary aggregate M1 has a significant impact on inflation in the Eurozone;
  H2.2: The Euro/Dollar exchange rate has a significant impact on inflation in the Eurozone.

4. RESEARCH RESULTS

4.1. DESCRIPTIVE STATISTICS

Based on the results of the descriptive statistics, it can be concluded that the average monthly inflation rate in the Eurozone in the period from July 2022 until September 2023 is 7.68%.

The mean value of the monetary aggregate M1 is 11,2593 billion Euros, the mean value of the three observed interest rates ranges from 2.2 to 3%. It is characteristic that the mean value of the Euro/Dollar exchange rate indicates a lower value of the Dollar in relation to the Euro.

The results indicate that the distribution of data for all variables is flatter than normal and has weak tails, and is within the boundaries of normality.

Namely, in all cases the Kurtosis values are in the interval from -3 to +3.

According to the results, the distribution of frequencies has a negative symmetry to the left, that is, a larger number of data is grouped on the right side of the tail. In all cases the Skewness values are in the interval from -3 to +3.

Table 1. Descriptive statistics

	HIPC	M1EU	DEFA	FIRT	MALE	EXRA
Mean	7,68	11,2593	2,23333	2,7333	3	1,056
Standard Error	0,52646	0,12574	0,35141	0,3514	0,353	0,01
Median	8,5	11,3	2,5	3	3,5	1,071
Mode	#N/A	#N/A	0	0,5	0,75	#N/A
Standard Deviation	2,03898	0,48699	1,36102	1,361	1,366	0,04
Sample Variance	4,15743	0,23716	1,85238	1,8524	1,866	0,002
Kurtosis	-1,392	-1,3578	-1,1534	-1,1534	-1,16	-0,975
Skewness	-0,2228	-0,3371	-0,4638	-0,4638	-0,5	-0,681
Range	6,3	1,38	4	4	4	0,122
Minimum	4,3	10,52	0	0,5	0,75	0,984
Maximum	10,6	11,9	4	4,5	4,75	1,106
Sum	115,2	168,89	33,5	41	45	15,84
Count	15	15	15	15	15	15
Largest(1)	10,6	11,9	4	4,5	4,75	1,106
Smallest(1)	4,3	10,52	0	0,5	0,75	0,984
Confidence Level(95,0%)	1,12915	0,26969	0,75371	0,7537	0,756	0,022

Source: Authors' calculation (Excel)

4.2. CORRELATION ANALYSIS

The correlation analysis indicates a positive correlation between inflation and the monetary aggregate M1, and the value of inflation records a significant negative correlation with the values of the other variables. Analogously to when interest rates rise, the inflation rate decreases, it can also be concluded that when the value of the Euro/Dollar exchange rate increases, the inflation rate decreases.

It is characteristic that the value of the monetary aggregate records a significant negative correlation with the three included interest rates.

Table 2. Correlation analysis

	HIPC	M1EU	DEFA	FIRT	MALE	EXRA
HIPC	1					
M1EU	0,66768	1				
DEFA	-0,872	-0,6886	1			
FIRT	-0,872	-0,6886	1	1		
MALE	-0,8636	-0,6899	0,99889	0,99889	1	
EXRA	-0,8	-0,5065	0,8644	0,8644	0,86638	1

Source: Authors' calculation (Excel)

4.3. REGRESSION ANALYSIS

Based on the regression statistics, it can be concluded that 68.8% of the variability of the dependent variable is explained by the variability of the independent variables.

Table 3. Regression statistics

Multiple R	0,85592356
R Square	0,73260515
Adjusted R Square	0,68803934
Standard Error	1,13883896
Observations	15

According to the results in the ANOVA table, it can be concluded that the model is statistically significant.

Table 4. ANOVA

	df	SS	MS	F	Significance F
Regression	2	42,64054995	21,32027498	16,43872657	0,000365526
Residual	12	15,56345005	1,29695417		
Total	14	58,204			

Source: Authors' calculation (Excel)

According to the results obtained from the regression analysis, it can be concluded that both independent variables have a high degree of influence on the dependent variable. Namely, the growth of M1 contributes to the growth of inflation in the Euro, and the Euro/Dollar exchange rate has an inversely proportional influence.

Table. 5 Regression results

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	24,49803892	15,19217348	1,61254339	0,132816401	-8,60286357	57,5989414
M1EU	1,478289747	0,72485076	2,039440155	0,064054014	-0,101024389	3,057603884
EXRA	-31,69286629	8,833851822	-3,587661071	0,003729431	-50,94017598	-12,44555661

Source: Authors' calculation (Excel)

5. DISCUSSION

The results of the research indicate the existence of a significant positive correlation between inflation and the monetary aggregate M1 and a high negative correlation between inflation and the interest rate of overnight bank deposits, loans to maintain the liquidity of banks within the framework of the European monetary system and overnight loans for banks in the monetary system, there is also a significant negative correlation between inflation and the Euro/Dollar exchange rate, this shows that monetary policy measures can significantly affect inflation and its management in order to return within the corridor. Analogously, hypothesis H1 is accepted. Based on the results of the regression analysis, it can be concluded that H2 is accepted, as both independent variables have a significant impact on inflation. A limiting factor in this research is that the role of fiscal policy, which also through its measures has a significant stabilizing role in dealing with economic shocks of this type, is not taken into account.

CONCLUSION

The monetary policy, as one of the key macroeconomic stabilizing policies, has a major role in dealing with inflationary shocks within a national economy. Namely, the disruption of global supply chains since the beginning of the Corona crisis, and the beginning of the Russian special military operation in Ukraine contributed to the emergence of the energy crisis and the drastic increase of food prices, raw materials for production, as well as oil, oil derivatives and gas

caused a significant inflation growth in Europe. The ECB started taking monetary measures in order to reduce the growth of inflation and reach the target rate of 2%. The measures primarily referred to an increase in interest rates on deposits made overnight, loans from the ECB to commercial banks to maintain liquidity and the rate of loans made overnight to banks within the European monetary system, also the monetary aggregate M1 began to decrease from September 2022 as a result of the measures. Based on the results of the research, it can be concluded that for the entire accounting period, the average value of inflation did not exceed a double-digit value, which indicates that it did not show a tendency to turn into galloping inflation, in addition, inflation during the accounting period has a high degree of correlation with other variables, and it is also significantly influenced by the movement of the monetary aggregate M1 and the Euro/Dollar exchange rate.

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