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## THE INFLUENCE OF THE RUSSIAN-UKRAINIAN CONFLICT ON THE EURO

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**Abstract:** The beginning of the Russian-Ukrainian conflict, like any conflict of such proportions in the past, caused a significant disruption of international, financial, monetary and trade flows, primarily due to the sanctions imposed by the collective West on the Russian economy and the imposed ban on the import of energy, grains and other products of Russian origin. Although, based on analyzes and expectations, many Western economists and creators of the sanctions claimed that they will cause damage to the Russian economy, and they will not cause macroeconomic destabilization of the European economy, that is, they will only contribute to the reduction of export revenues in the Russian federal budget, and thus will indirectly imply the curtailment of the funds for financing the war and a quick end to it, but the sanctions caused the opposite effect as a rapid increase in the stock prices of oil, oil derivatives and basic grains was observed. The new situation on the world stock markets has a significant impact on a large number of countries, including the Eurozone, as an optimal currency area and an economy dependent on the import of Russian cheap energy, life and agricultural fertilizers, which according to a large number of studies are included in a crucial condition for rapid economic growth and maintenance of macroeconomic stability, to reduce with high inflation rates, budget deficit, growth of public borrowing and management of the euro in relation to the US dollar. The focus of this paper is the historical overview of the change in the value of the euro in relation to the US dollar and the effect of the same on the flow of trade between the Eurozone and the USA as the largest trading partner and the identification and analysis of the key internal and external factors that caused the depreciation of the euro to the extent that in a certain period the US dollar is more expensive in relation to the euro, which further destabilizes macroeconomic parameters. Consequently, the paper provides an answer to the question related to the reflection of the Russian-Ukrainian conflict on the fall in the value of the euro and the significance of the transmission channels of the same within the international financial and trade system, with special reference on relations between the Eurozone and the USA.

The empirical research is conducted using secondary data from relevant institutions such as Eurostat and European commission reports, International Monetary Fund (IMF), World Bank and World Trade Organization (WTO). The research consists of descriptive statistics, correlation analysis and regression analysis using the method of ordinary least squares (OLS).

**Keywords:** Depreciation, Euro, Eurozone, Russian-Ukrainian conflict, US Dollar.

### 1. INTRODUCTION

The beginning of the Russian-Ukrainian conflict caused significant distortions of international trade flows because, on one hand, global supply chains were disrupted due to military actions on the territory of Ukraine, which is one of the largest exporters of grains, and on the other hand, the sanctions imposed by the so called Western world of the Russian Federation that contributed to the rapid growth of the price of futures for trading oil and oil derivatives. As a result of the new reality of world economic flows, that is, the global economic shock from the supply side, a large number of countries, especially the countries of Europe, including the Eurozone which is observed as an optimal currency area, faced: 1) rapid growth of inflation, 2) growth of budget deficits and 3) growth of public debts. In addition to the already mentioned macroeconomic shocks, the Eurozone has also faced a depreciation of the Euro against the US dollar, that is, imports from the USA became significantly more expensive, while the macroeconomic situation worsened precisely because of the need to import large quantities of liquid petroleum gas from the USA.

Besides the strong growth of inflation and the increase of indebtedness, depreciation of the Euro was also caused by the way of creating the so-called monetary response to the emerging macroeconomic situation as a result of the conflict. Thus, due to the uncoordinated increase of reference interest rates by the FED a gap between monetary policies has arisen in the USA and the ECB in the Eurozone (Cingari, 2023).

Namely, the FED started introducing measures to deal with the crisis in March 2022, whereas in March the measure of increasing the reference interest rate from 0.25% to 0.50% was applied (Tepper & Curry, 2023), unlike the FED, the ECB started increasing the reference interest rate in July 2022, thus creating a time gap of several months (ECB, 2022). In addition to the already mentioned reasons such as the conflict and its consequences and the time difference

in the introduction of the measures by the FED and the ECB, the Eurozone was also faced with a significantly reduced consumption, investor reticence, that is, focus was put more on the conservative approach when investing and growth of negative expectations of households and businesses, especially those businesses in Germany, whose economy is the instigator of the Eurozone (Ilzetzi & Jain, 2023).

The purpose of this paper is an overview of the change in the value of the euro in relation to the US dollar and the impact of changes in trade flows, given that the US is the largest trade partner of the EU, that is, the Eurozone, as well as identifying the determinants that caused depreciation of the euro in relation to the dollar as well as the transmission channels of the Russian-Ukrainian conflict in the direction of destabilizing the euro.

The research consists of a graphic overview of the change in the value of the euro in relation to the US dollar, a descriptive statistics of the value of the euro in relation to the dollar and other variables included in the model, a correlation analysis and analysis of the reasons for the depreciation of the euro in 2022 by applying the method of ordinary least squares (OLS method).

## 2. LITERATURE REVIEW

A large number of macroeconomists believe that the countries of the European continent, including the Eurozone, received the Russian special operation in Ukraine unprepared and rushed to impose extensive sanctions on the Russian economy. The creators of the sanctions believed that the introduction of sanctions for the Russian economy would mean a slowdown of the Russian economy and a quick end to the military operation, which would avoid a strong macroeconomic shock on the supply side, but the introduction of them in practice meant the beginning of a strong macroeconomic shock for those who introduced them, and the continuation of the economic growth of Russia that in the first 6 months of 2023 amounted to 1.6% and a significant energy success that contributed to the growth of Russia's current account surplus of 10% in 2022 (Ash, 2023). According to a large number of critics of the sanctions, the creators did not take into account the dependence of Europe on Russian energy and Ukrainian grains, which after the invasion are under the control of the Russian military. The onset of the Russian-Ukrainian conflict has caused extensive macroeconomic changes, affecting a number of countries. Thus, the beginning of the conflict, according to many economists, indirectly caused the depreciation of the euro in relation to the US dollar, but according to the CFM-CEPR survey, 56% of those surveyed believe that the reason for the depreciation of the euro is the difference in the monetary policy, and only 30% of those surveyed consider that the reason for depreciation of the euro is the general macroeconomic situation, that is, the Russian-Ukrainian conflict (Ilzetzi & Jain, 2023). Based on economic analyzes of the European Commission that refer to this problem, it can be concluded that depreciation of the euro has a much broader basis, namely, in addition to the pressure from the change in the monetary policy of the FED, and consequently to that, the increasing pressure from the American dollar, a big contribution to depreciation of the euro was also the different expectations of the market participants who operate within the Eurozone within the domain of the European monetary policy, that is, its pace and specific measures in accordance with the other currencies that are used in the field of foreign trade relations of the Eurozone, the geopolitical risks and changes that have occurred in Ukraine, but also the expectations for the behavior and positioning of the countries that are trading partners (European Commission, 2022).

A number of relevant analyzes structure several key factors that contribute to the depreciation of the euro. Thus, as one factor that contributed to the depreciation of the euro, is cited as Europe's dependence on imports of Russian energy, especially gas, which is one of the main raw materials in the Eurozone, but they also state that the disruption of global supply chains contributed to a significant rise in prices not only of energy but also of food, beverages, agricultural products, and such (Di Bella, Flanagan, Foda, & Maslova, 2022). What is characteristic is that Europe, that is, the Eurozone, on one hand maintains the sanctions against the Russian Federation, and on the other hand in order to be supplied with gas had to import it from the USA, the increased demand for American liquid gas implied a growth in the demand for US dollars, and with that, according to theory and practice the dollar appreciated. The difference in the long-term interest rate between the Eurozone and the United States is mentioned as a second factor. Thus, according to the theory, when the interest rate in one country rises compared to another, then the capital of the second tends to overflow into the first, that is, into the one with a higher rate of return (De Vijlder, 2023). In this case, with the measures of the FED and the increase of the reference interest rate of the United States, a few months before the measures of the ECB, part of the capital that was located in the countries of the Eurozone pretended to flow to the United States (CaixaBank, 2023). The third factor is the role of the dollar during political, security and financial crises, which in practice is quite exploited, where the dollar as a strong currency appears a function of the so-called protector of economies during crises, namely in case of crises the US dollar serves as the so-called safe haven for foreign capital, especially capital from those economies that would be volatile to shocks, which in this case is the European economy as a whole (Georgiadis, Müller, & Schumann, 2021).

### 3. METHODOLOGY

The research was done using secondary data from relevant institutions such as Eurostat and European commission reports, European Central Bank (ECB), International Monetary Fund (IMF), World Bank and World Trade Organization (WTO). In order to increase quality, relevance, depth and contribution of the research results, several criteria were taken into account during the selection of the data source, such as: 1) the date of publication, 2) the relevance of the institution, 3) the quality of data and 4) the degree of contribution of the data during preparation of the model. The research refers to the period from January 2022 till December 2022 (12 months) and is composed of descriptive statistics of the variables included in the model, correlation analysis and regression analysis using the method of least squares (OLS method).

Hypotheses:

**H<sub>1</sub>**. The Russian-Ukrainian conflict has a significant impact on the depreciation of the euro;

- **H<sub>1.1</sub>** – The average monthly inflation in the Eurozone has a significant impact on the depreciation of the euro;
- **H<sub>1.2</sub>** – The average monthly price of LPG has a significant impact on the depreciation of the euro;
- **H<sub>1.3</sub>** – The average monthly price of Brent oil has a significant impact on the depreciation of the euro;
- **H<sub>1.4</sub>** – The monthly balance of the current account of the Eurozone has significant impact on the depreciation of the euro;

The regression analysis is represented by the following equation:

$$EDR_t = \beta_0 + \beta_1 INF_t + \beta_2 LGP_t + \beta_3 BOP_t + \beta_4 CAC_t + \varepsilon$$

t – month spanning from January 2022 to December 2022

$\varepsilon$  – residuals

| Variables   | Acronym | Unit             | Source   |
|---|---------|------------------|----------|
| US Dollar to Euro average monthly exchange rate<br>(Dependent variable)               | EDR     | EDR <sub>t</sub> | IMF      |
| Average monthly Inflation in Eurozone<br>(Independent variable)                       | INF     | $\beta_1$        | Eurostat |
| LPG average monthly price<br>(Independent variable)                                   | LGP     | $\beta_2$        | Eurostat |
| Crude BRENT oil average monthly price<br>(Independent variable)                       | BOP     | $\beta_3$        | WTI      |
| Current Account monthly balance of Eurozone payment balance<br>(Independent variable) | CAC     | $\beta_4$        | ECB      |

### 4. RESEARCH RESULTS

According to Graph 1, it can be concluded that the depreciation of the euro in relation to the US dollar is observed in the month of February, where the value of the euro rapidly begins to decline. Although oscillations are observed, the fall of the euro against the US dollar lasts until October, and from November 2022 begins a cycle of growth of the value of the euro against the dollar.

**Chart 1: US Dollar to Euro exchange rate Jan. 2022 – Dec. 2022**



Source: International Monetary Fund

According to the descriptive statistics in Table 1, it can be concluded that the average exchange rate of the US dollar against the euro for the period from January to December 2022 is 1.05, where the euro has a higher value than the dollar, the average value of inflation is 8.4%, and the average current account balance is positive, that is, there is a surplus based on average for the period. According to the results, for the price of gas, the data distribution is more skewed than normal, and for the rest of the variables, it is flatter than normal. In inflation, the distribution of frequencies has a negative symmetry, and in other variables it has a positive symmetry to the left.

**Table 1: Descriptive statistics**

|                                | <b>EDR</b>   | <b>INF</b>   | <b>LGP</b>  | <b>BOP</b>  | <b>CAC</b>   |
|--------------------------------|--------------|--------------|-------------|-------------|--------------|
| <b>Mean</b>                    | 1,054116667  | 8,358333333  | 40,33833333 | 100,7775    | 76,33333333  |
| <b>Standard Error</b>          | 0,014646728  | 0,481547117  | 3,848831352 | 3,818553416 | 41,47513555  |
| <b>Median</b>                  | 1,0562       | 8,75         | 35,88       | 98,79       | 87,5         |
| <b>Mode</b>                    | #N/A         | 7,4          | #N/A        | #N/A        | #N/A         |
| <b>Standard Deviation</b>      | 0,050737754  | 1,668128147  | 13,3327429  | 13,22785706 | 143,674084   |
| <b>Sample Variance</b>         | 0,00257432   | 2,782651515  | 177,7620333 | 174,9762023 | 20642,24242  |
| <b>Kurtosis</b>                | -0,958603608 | -0,127597148 | 0,905666431 | -1,10902642 | -1,524730621 |
| <b>Skewness</b>                | 0,302425225  | -0,701245096 | 1,275231269 | 0,239987547 | 0,080574768  |
| <b>Range</b>                   | 0,1507       | 5,5          | 42,81       | 41,79       | 405          |
| <b>Minimum</b>                 | 0,9835       | 5,1          | 27,23       | 80,92       | -111         |
| <b>Maximum</b>                 | 1,1342       | 10,6         | 70,04       | 122,71      | 294          |
| <b>Sum</b>                     | 12,6494      | 100,3        | 484,06      | 1209,33     | 916          |
| <b>Count</b>                   | 12           | 12           | 12          | 12          | 12           |
| <b>Largest(1)</b>              | 1,1342       | 10,6         | 70,04       | 122,71      | 294          |
| <b>Smallest(1)</b>             | 0,9835       | 5,1          | 27,23       | 80,92       | -111         |
| <b>Confidence Level(95,0%)</b> | 0,032237231  | 1,059878059  | 8,47122069  | 8,404579401 | 91,28615785  |

Source: Authors' calculations

Table 2, where the correlation of data of the variables applied in the model is shown, indicates a positive correlation of the average monthly price of Brent oil and the monthly balance of the current account of the balance of payments of the Eurozone with the average monthly exchange rate of the US dollar against the euro, and the average monthly price of LPG and the average monthly inflation in the Eurozone have a negative correlation. It is characteristic that the correlation of the exchange rate with inflation and the current account balance is very strong. Inflation has a

strong negative correlation with the current account balance of the Eurozone, and a slight positive correlation with the price of gas.

*Table 2: Correlation analysis*

|     | EDR        | INF        | LGP        | BOP       | CAC |
|-----|------------|------------|------------|-----------|-----|
| EDR | 1          |            |            |           |     |
| INF | -0,9416373 | 1          |            |           |     |
| LGP | -0,6380863 | 0,4943845  | 1          |           |     |
| BOP | 0,0782172  | -0,0939887 | -0,0110508 | 1         |     |
| CAC | 0,8443474  | -0,9272849 | -0,4728526 | 0,3929501 | 1   |

Source: Authors' calculations

Based on the results of the regression statistics, it can be concluded that there is a very strong relationship between the exchange rate of the dollar against the euro as a dependent variable and independent variables in the model. 91.8% of the variability of the dependent variable is explained by the variability of the independent variables, and the remaining 8.2% are explained by the variability of other phenomena that are not included in the regression.

*Table 3: Regression statistics*

|                          |           |
|--------------------------|-----------|
| <b>Multiple R</b>        | 0,9736896 |
| <b>R Square</b>          | 0,9480714 |
| <b>Adjusted R Square</b> | 0,918398  |
| <b>Standard Error</b>    | 0,0144938 |
| <b>Observations</b>      | 12        |

Source: Authors' calculations

According to the results of the regression analysis, it can be concluded that for depreciation of the euro, the biggest share is: 1) the growth of inflation in the Eurozone ( $p < 0.05$ ,  $p = 0.005988$ ) and 2) the price of liquid petroleum gas (LPG) ( $p < 0.05$ ,  $p = 0.0401013$ ). Namely, the price of LPG on the stock market and the growth of inflation cause a significant decrease in the value of the euro in relation to the US dollar.

*Table 4: Regression results (OLS Method)*

|           | Coefficients | Standard Error | t Stat     | P-value   | Lower 95%  | Upper 95%  |
|-----------|--------------|----------------|------------|-----------|------------|------------|
| Intercept | 1,396227     | 0,0695353      | 20,07941   | 1,902E-07 | 1,2318022  | 1,5606517  |
| INF       | -0,0439649   | 0,0113068      | -3,8883716 | 0,005988  | -0,0707012 | -0,0172287 |
| LGP       | -0,0009581   | 0,0003809      | -2,5150217 | 0,0401013 | -0,0018589 | -5,729E-05 |
| BOP       | 0,0008222    | 0,0005859      | 1,4034347  | 0,2032579 | -0,0005631 | 0,0022076  |
| CAC       | -0,0002469   | 0,0001435      | -1,7212622 | 0,1288799 | -0,0005862 | 9,23E-05   |

Source: Authors' calculations

## 5. DISCUSSION

Although a number of economists have different claims about the depreciation of the euro against the US dollar in 2022. However, according to most relevant analyzes carried out by the leading economic institutions, it can be concluded that the Russian-Ukrainian conflict played the biggest role in the depreciation of the euro against the dollar indirectly, through: 1) the dependence of the EU countries, including the Eurozone, on Russian gas and other energy issues and 2) the gap between monetary policy and interest rates. According to the results of this research, which was carried out using the OLS method, it can be concluded that the biggest share in depreciation of the euro in relation to the dollar is the growth of inflation in the Eurozone, thus confirming the hypothesis  $H_{1.1}$  and the dependence of the EU on Russian gas, and with the introduction of sanctions against the Russian Federation and the ban on the import of Russian gas, the dependence on the expensive American liquid petroleum gas, thus confirming

the hypothesis  $H_{1.2}$ . Analogously, in order to supply the union with the necessary quantities of gas, it resorted to a rapid increase in the import of LPG from the USA, which in a way put pressure on the US dollar, that is, the growth in the demand for US dollars caused an increase in the value of the dollar, and contrary to that fall in the value of the euro. The results of the research empirically confirm the theory of changes in the value of currencies and a large part of the claims of world macroeconomists.

## 6. CONCLUSION

The beginning of the Russian-Ukrainian conflict, as a global conflict, caused drastic changes in world economic and trade flows, and also caused considerable geopolitical unpredictability. The introduction of sanctions by the so-called Western world on the Russian Federation did not meet the expectations of the creators for the weakening of the Russian economy and a quick end to the war, but the same in practice had the opposite effect that culminated in the depreciation of the Euro and a partial recession of the European economy. The dependence of Europe, and thus of the Eurozone on Russian gas and energy and the introduction of sanctions were disarranged from the very beginning. Namely, the ban on the import of Russian gas made Europe dependent on the import of American LPG, which created strong pressure on both the Euro and the Dollar. According to the research, although several variables affect the depreciation of the Euro, the price of US LPG and inflation have the greatest impact on the value of the Euro. This geopolitical and economic situation conditions an extensive analysis by the EU as a regional integration of its political positioning in relation to the Russian Federation and the management of sanctions in the future, and on the other hand, taking long-term measures to maintain the stability of the Euro, taking coordinated monetary measures with the largest trade partners and partial reorganization of the economic system in the direction of increasing resilience in conditions of an unstable environment and prevention of financial shocks.

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