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UNDERSTANDING INFLATION DRIVERS IN NORTH MACEDONIA: AN ECONOMETRIC ANALYSIS

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ABSTRACT

Inflation plays a key role in a country's economy, especially in terms of its economic stability and growth. Understanding its determinants is essential for formulating effective policies. This paper analyzes the factors influencing the rate of inflation in the Republic of North Macedonia in the period 2002–2023. The objective is to identify and assess the impact of the money supply (M2), the real effective exchange rate of the Macedonian denar (MKD), and the unemployment rate (independent variables) on the inflation rate (dependent variable) in the analyzed period. In the paper, a statistical analysis was performed that identified the possible correlations between the dependent variable and the three independent variables. Also, econometric modeling and evaluation of the model was performed using the ordinary least squares (OLS) linear regression method. The results of the research have been properly interpreted and relevant conclusions have been drawn based on that. This research is particularly useful for economists, policymakers and the Central Bank of the country, as it provides insights into inflation dynamics. Based on this information, they will be able to develop and implement appropriate monetary policies to control and manage the economy, which is crucial for achieving economic stability and growth.

Keywords: inflation rate, determinants, correlation, econometric analysis, OLS regression, North Macedonia

INTRODUCTION

Inflation, a key macroeconomic indicator, represents the sustained increase in the general price level of goods and services in an economy over time. It reflects changes in purchasing power and has profound implications for economic stability, growth, and individual well-being. Central banks and policymakers closely monitor inflation, as it influences monetary policy decisions, investment climates, and living standards. Inflation is typically measured using price indices, such as the Consumer Price Index (CPI) and the Producer Price Index (PPI). While moderate inflation is often a sign of healthy economic growth, excessive or prolonged inflation, hyperinflation, can destabilize economies.

Conversely, deflation, or negative inflation, can signal economic stagnation and discourage consumption and investment.

The phenomenon of inflation is influenced by a complex interplay of demand-pull factors, such as increased consumer spending, and cost-push factors, such as rising production costs. Global economic trends, monetary policy, and geopolitical events also play significant roles in shaping inflationary pressures. As Milton Friedman, the well-known American economist and statistician, once famously asserted: "*Inflation is always and everywhere a monetary phenomenon, in the sense that it is and can be produced only by a more rapid increase in the quantity of money than in output*." Inflation occurs when the supply of money in an economy surpasses the availability of goods and services, leading to a rise in the overall price level (Fiti 2010, 389). Understanding inflation is crucial for evaluating economic performance and devising strategies to foster sustainable growth while maintaining price stability. Inflation is one of the key macroeconomic indicators that affect the economic stability of a country. In North Macedonia, as in other transition and developing economies, this indicator plays an important role in fiscal and monetary policy.

The inflation rate (IR) is measured as follows (Fiti 2010, 390):

$$IR = \frac{Price\ level\ (year\ t) - Price\ level\ (year\ t-1)}{Price\ level\ (year\ t-1)} \cdot 100\ [\%]$$

The subject of this research is to analyze the factors that affect inflation in the Republic of North Macedonia in the period from 2002 to 2023, with a single aim to assess the impacts of three factors (determinants), including the Money Supply (M2), the Real Effective Exchange Rate (REER) of the Macedonian Denar, and the Unemployment Rate on the Inflation Rate in the analyzed period. The intention is to leverage the multiple Ordinary Least Square (OLS) linear regression methodology through the utilization of the software package Microfit 5.5 to model the interdependencies between the variables of interest, as well as to assess the impact of the three independent variables on the dependent variable.

The study is organized as follows. Section 2 provides an overview of some of the most relevant research made on this topic during recent years. Section 3, through its three subsections, sheds light on the data, methodology, and results obtained by the assessment/evaluation of the OLS regression model. The results are discussed and interpreted in Section 4. The last section concludes and provides directions for further research.

RELATED RESEARCH

Extensive research has been conducted on inflation during the several last decades, exploring various dimensions and implications of this complex economic phenomenon. This section focuses on providing insights into some of the most recent related research.

In his MBA thesis, Remesh (2021) explored the concepts, causes, and effects of inflation in the Indian economy, whilst in his doctoral thesis, Stojanovikj (2021) analyzed inflation targeting in emerging markets, finding it moderately effective in reducing inflation but less advantageous compared to other strategies. Đukić *et al*. (2023) investigated the use of online data to track inflation movements in real time, while improving the accuracy of short-term forecasts. The method uses automatic downloading and processing of a huge amount of data. Nguyen *et al*. (2022) examined the relationship between money supply and inflation in Vietnam in the period 2005–2021, whilst the same type of relationship (both in long-run and short-run) for Pakistan was investigated by Stylianou *et al*. (2024) applying the ARDL methodology. The impact of the real effective exchange rate on inflation in Pakistan was the subject of the research carried out by Asad *et al*. (2012). The relationship between unemployment and inflation in USA was studied by Qin (2020) and Barros (2022).Sinan (2023) examined the relationship between inflation rate, real effective exchange rate, and unemployment rate for Turkey, using the ARDL methodology.

DATA, METHODOLOGY, AND RESULTS

Data

This study takes into account a single dependent variable and three independent variables, as follows:

- *Dependent variable*:
  - Y: Inflation Rate, in percentages [%], as a measure of a nation's economic well-being, measuring how much more expensive a set of goods and services has become over a certain period, usually a year;
- *Independent variables*:
  - X1: Money Supply M2 (liquid assets), which includes monetary aggregate M1 and short-term deposits, in percentages [%].When the money supply expands excessively compared to the economy's size, the currency's value decreases, resulting in reduced purchasing power and higher prices;
  - X2: Real Effective Exchange Rate (REER) of the Macedonian denar [MKD], in percentages [%]. It is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs. As one of the most significant macroeconomic indicators, it implicitly shows how the nominal exchange rate is realistically measured vis-à-vis its macroeconomic, primarily foreign trade effects;
  - X3: Unemployment Rate, in percentages [%]. It measures the share of workers in the labor force who do not currently have a job but are actively looking for work.

These data, which refer for the period 2002‒2023, are taken annually from credible and official sources as secondary data. The values for the Inflation Rate (variable Y) are taken over from the Macedonian Ministry of Finance (MoF 2024), the data for the Money Supply (M2) (variable X1) and the Unemployment Rate (variable X3) are taken from the official website of the National Bank of the Republic of North Macedonia (NBRNM 2024a), whilst the data for the Real Effective Exchange Rate of the Macedonian Denar (variable X2) are taken from the Statistical Web Portal of the National Bank of the Republic of North Macedonia (NBRNM 2024b).

Methodology

The methodology used is based on developing a multiple linear regression model, built on the utilization of the Ordinary Least Squares (OLS) method (Nikoloski 2008, 47). This method is founded on minimizing the sum of squares of the residuals, as pointed out by Eq. (1).

$$min \sum \hat{u}_t^2 = \sum (Y_t - \hat{Y})^2 = \sum (Y_t - \hat{\beta}_1 - \hat{\beta}_2 X_t)^2 \tag{1}$$

Then the partial derivatives of the sum of squares of the residuals are determined with respect to the two parameters to be estimated. This way, a system consisting of two normal equations is obtained. The first normal equation is given by Eq. (2), while the second one is presented by Eq. (3).

$$\sum Y_t = n\hat{\beta}_1 + \hat{\beta}_2 \sum X_t \tag{2}$$

$$\sum Y_t X_t = \hat{\beta}_1 \sum X_t + \hat{\beta}_2 \sum X_t^2 \tag{3}$$

The solutions to the system of normal equations give the parameter estimates, as portrayed by Eq. (4) (Nikoloski 2008, 47):

$$\hat{\beta}_1 = \bar{Y} - \hat{\beta}_2\bar{X}, \hat{\beta}_2 = \frac{\sum x_t y_t}{\sum x_t^2} \tag{4}$$

In its general form, the linear regression model, comprised of a single dependent and three independent variables is given by Eq. (5).

$$Y_t = \beta_0 + \beta_1 X_{t1} + \beta_2 X_{t2} + \beta_3 X_{t3} + u_t \tag{5}$$

where:

- Y_t is the dependent variable at time *t*;
- β_0 is the intercept value of the dependent variable when the values of the three independent variables are equal to zero;
- $\beta_1, \beta_2, \beta_3$ are the values of the partial coefficients, i.e., the coefficients of the three independent variables;
- X_{t1}, X_{t2}, X_{t3} are the three independent variables that influence the dependent variable Y_t;
- u_t is the error term.

The Durbin-Watson statistics can be calculated according to Eq. 6 (Nikoloski 2008, 154).

$$d = \frac{\sum_{t=2}^{t=n}(\widehat{u_t} - \widehat{u_{t-1}})^2}{\sum_{t=2}^{t=n}\widehat{u_t}^2} \tag{6}$$

Taking into account Figure 1, there are two null hypotheses that can be tested vis-à-vis the autocorrelation, based on the critical values of the Durbin-Watson statistics:

H_0: there is no positive autocorrelation
H_0^*: there is no negative autocorrelation

The critical values of the Durbin-Watson statistics, d_L and d_u, presented in Figure 1, are read from the table named 'Critical values of Durbin-Watson statistics' (Nikoloski 2008, 181).

It should be noted that all the analyses were carried out using the econometric software package Microfit 5.5, an interactive, menu-driven program suitable for estimation, hypothesis testing, forecasting, data processing, file management, and graphic display, which makes it one of the most powerful econometric packages currently available (Microfit 2017).

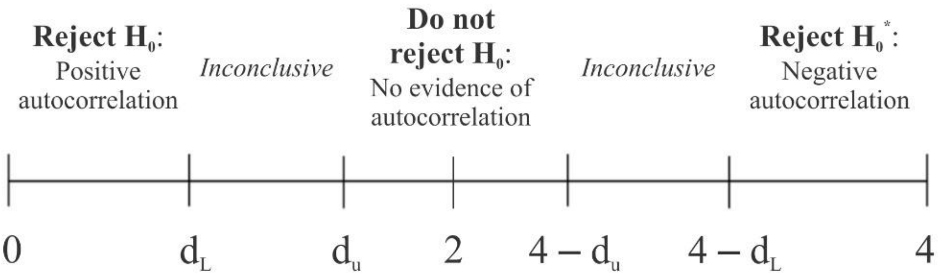

Figure 1. Critical region of Durbin-Watson test (Source: Ullah (2021))

Results

Descriptive and correlation analysis

Figure 2 shows the descriptive statistics of the four variables.

Sample period : 22 observations from 2002 to 2023

Variable(s)	Y	X1	X2	X3
Maximum	14.2000	42.1000	111.0700	37.3000
Minimum	-.80000	-14.3000	95.5700	13.1000
Mean	2.6636	10.8136	101.1109	27.2909
Std. Deviation	3.6339	10.7655	3.5542	8.1222
Skewness	1.8773	.85807	.98864	-.44908
Kurtosis - 3	3.0896	2.7417	.97286	-1.1964
Coef of Variation	1.3643	.99555	.035151	.29761

Figure 2. Descriptive statistics (Source: The author, Microfit 5.5 output)

The estimated correlation matrix is portrayed in Figure 3.

Estimated Correlation Matrix of Variables
22 observations used for estimation from 2002 to 2023

	Y	X1	X2	X3
Y	1.0000	-.068091	.39508	-.37959
X1	-.068091	1.0000	-.27819	.26185
X2	.39508	-.27819	1.0000	-.53732
X3	-.37959	.26185	-.53732	1.0000

Figure 3. Correlation analysis (Source: The author, Microfit 5.5 output)

Econometric analysis

The scatterplot of the dependent variable Y on the first independent variable X1 is presented by Figure 4.

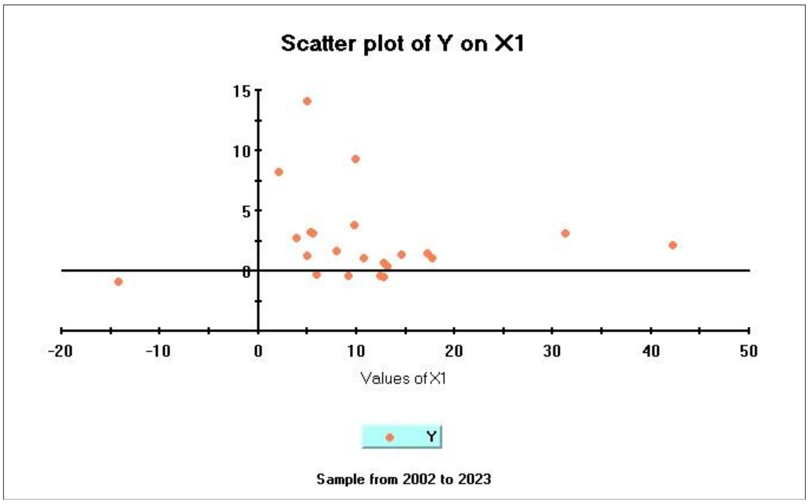

Figure 4. Scatterplot of the dependent variable Y on the independent variable X1
(Source: The author, Microfit 5.5 output)

Figure 5 and Figure 6 show the scatterplots of the dependent variable Y on the second and the third independent variable X2 and X3, respectively.

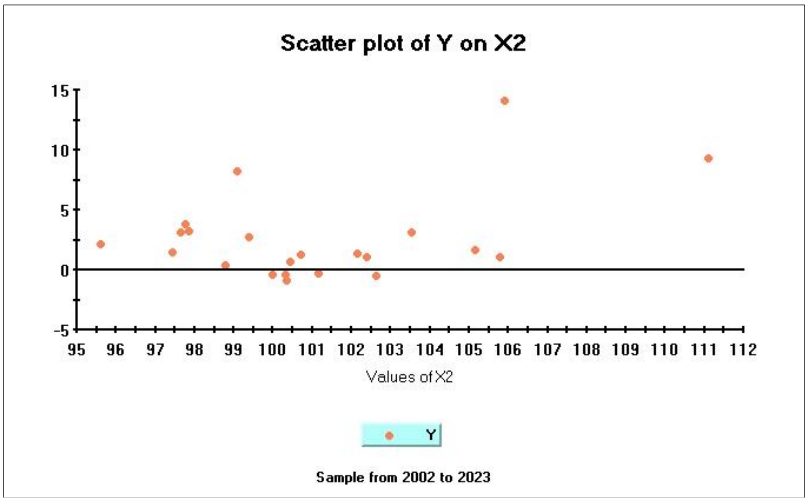

Figure 5. Scatterplot of the dependent variable Y on the independent variable X2
(Source: The author, Microfit 5.5 output)

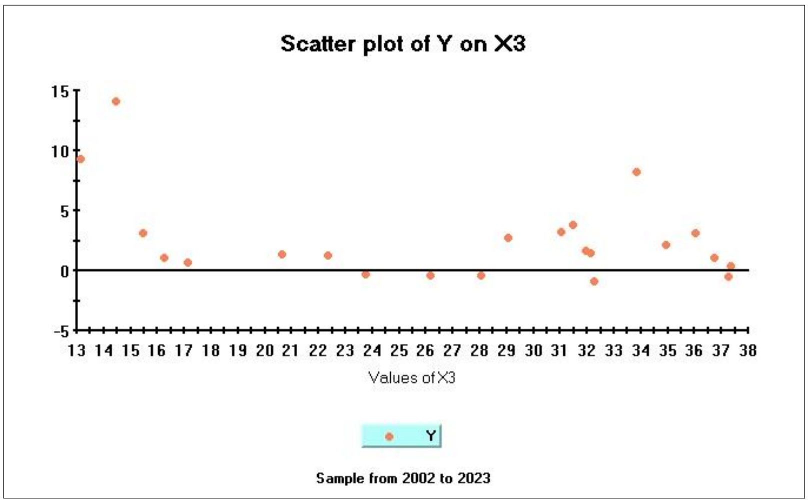

Figure 6. Scatterplot of the dependent variable Y on the independent variable X3 (Source: The author, Microfit 5.5 output)

Figure 7 shows the dynamics of all four variables over time.

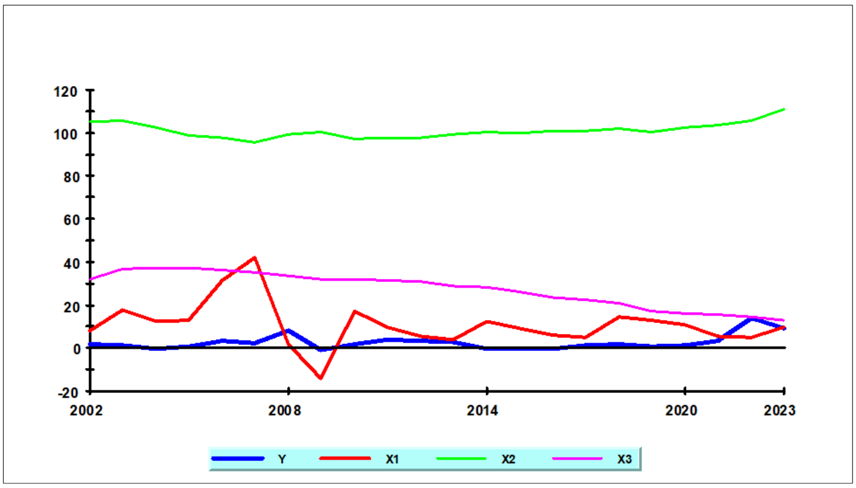

Figure 7. Dynamics of the variables over time (Source: The author, Microfit 5.5 output)

The OLS estimation of the coefficients inherent to the observed multiple regression model described by Eq. (5) is given in Figure 8.

Based on the values given in Figure 8, confidence intervals in which unknown parameters, or the value of the dependent variable Y, are likely to be located, can be computed. Given that the risk level $\alpha = 0.05$ (one-tailed) and $\alpha/2 = 0.025$ (two-tailed), the total number of observations is $n = 22$, the total number of variables is $k = 4$, the number of degrees of freedom is $df = n - k = 22 - 4 = 18$, the critical value of T-statistics $tcrit = 2.445$, and knowing that $\delta = Std.\ Error \times tcrit$, Table 1 shows the confidence interval estimations for all four variables (Nikoloski 2008, 179).

```
                     Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is Y
 22 observations used for estimation from 2002 to 2023
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 C                         -23.8791            28.0175            -.85229[.405]
 X1                         .025460            .074782             .34045[.737]
 X2                          .28963             .25921             1.1174[.279]
 X3                         -.11057             .11289            -.97944[.340]
*******************************************************************************
 R-Squared                     .20059   R-Bar-Squared                  .067356
 S.E. of Regression            3.5094   F-Stat.    F(3,18)       1.5055[.247]
 Mean of Dependent Variable    2.6636   S.D. of Dependent Variable      3.6339
 Residual Sum of Squares     221.6849   Equation Log-likelihood       -56.6290
 Akaike Info. Criterion      -60.6290   Schwarz Bayesian Criterion    -62.8111
 DW-statistic                  1.4046
*******************************************************************************
```

Figure 8. OLS estimation (Source: The author, Microfit 5.5 output)

Table 1. Confidence intervals estimation (Source: The author, Microfit 5.5 output)

Parameter	Coefficient	Std. error	tcrit	δ	Lower limit	Upper limit
B1	–23.8791	28.0175	2.445	68.5028	–92.3818875	44.6236875
B2	0.02546	0.07478	2.445	0.18284	–0.15738199	0.20830199
B3	0.28963	0.25921	2.445	0.63377	–0.34413845	0.92339845
B4	–0.11057	0.11289	2.445	0.27602	–0.38658605	0.16544605

Model residuals are depicted in Figure 9.

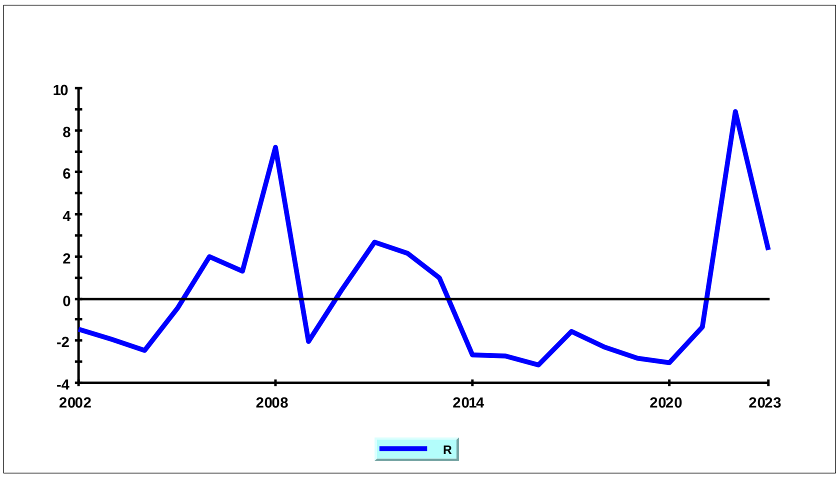

Figure 9. Model residuals over time (Source: The author, Microfit 5.5 output)

The Durbin-Watson statistics equals to 1.4046, as presented in Figure 8.

DISCUSSION

The descriptive statistics in Figure 2, based on the coefficient of variation, indicate that the inflation rate (Y) exhibits greater variability compared to the money supply (X1), the real effective exchange rate of the Macedonian denar (X2), and the unemployment rate (X3).

From the estimated correlation matrix portrayed in Figure 3, it can be concluded that:

- There is a negative, yet very weak correlation (–0.068091) between the Inflation Rate (Y) and the Money Supply (X1). These two variables move in an opposite direction, such that when the Money Supply increases, the Inflation Rate decreases and vice-versa;
- There is a positive, yet relatively weak correlation (+0.39508) between the Inflation Rate (Y) and the Real Effective Exchange Rate of Macedonian Denar (X2). These two variables move in a same direction, so when the Real Effective Exchange Rate of Macedonian Denar increases, the Inflation Rate also increases;
- There is a negative, yet relatively weak correlation (–0.37959) between the Inflation Rate (Y) and the Unemployment Rate (X3). These two variables move in opposite directions, such that when the Unemployment Rate increases, the Inflation Rate decreases, and vice-versa;
- There is a negative, yet relatively weak correlation (–0.27819) between the Money Supply (X1) and the Real Effective Exchange Rate of Macedonian Denar (X2). These two variables move in an opposite direction: when the Real Effective Exchange Rate of Macedonian Denar increases, the Money Supply decreases, and vice-versa;
- There is a positive, yet relatively weak correlation (+0.26185) between the Money Supply (X1) and the Unemployment Rate (X3). These two variables move in the same direction;
- There is a negative, yet relatively moderate correlation (–0.53732) between the Real Effective Exchange Rate of Macedonian Denar (X2) and the Unemployment Rate (X3). Because these two variables move in an opposite direction, when the Unemployment Rate increases, the Real Effective Exchange Rate of Macedonian Denar decreases, and vice-versa.

The scattering cloud (Y *vs*. X1), depicted in Figure 4, is mainly concentrated around a single area. A positive trend is possible to be constructed, but the correlation seems weak because the points do not form a clear line.

The scatterplot (Y *vs*. X2), shown in Figure 5, shows the existence of a slight upward trend. When the Real Effective Exchange Rate of the Macedonian Denar increases, the Inflation Rate also increases.

The scatterplot (Y *vs*. X3) in Figure 6 reveals an inverse relationship, where the Inflation Rate tends to decline as the Unemployment Rate rises. This phenomenon can be attributed to reduced consumption and limited resource demand during periods of high unemployment, which alleviates price pressures and alters inflation dynamics.

The graphical representation of all four variables' dynamics over time, given in Figure 7, suggests that:

- The Inflation Rate (Y) graph shows fluctuating trends over the years, reflecting economic conditions and the influence of monetary and fiscal policies.
- The Money Supply (X1) graph reveals pronounced fluctuations, with notable periods of growth and decline, potentially influencing the Inflation Rate.
- The Real Effective Exchange Rate (REER) of the Macedonian Denar (X2) exhibits a relatively stable and slightly upward trend over the years;
- The Unemployment Rate (X3) exhibits a relatively stable, yet decreasing trend over the years.

According to the OLS estimation results, presented in Figure 8, the estimated values of coefficients of the multiple linear regression are as follows:

- $\widehat{\beta_0} = -23.8791$; The intercept represents the value of the Inflation Rate (Y) in the case when all three independent variables (X1 = the Money Supply, X2 = the Real Effective Exchange Rate of the Macedonian Denar, and X3 = the Unemployment Rate) are equal to 0 (i.e., zero);
- $\widehat{\beta_1} = +0.025$; Assuming the *ceteris paribus* principle (i.e., assuming an unchanged Real Effective Exchange Rate of Macedonian Denar and an unchanged Unemployment Rate), when the Money Supply increases by 1 percentage point [pp], the Inflation Rate will increase by 0.025 [pp];
- $\widehat{\beta_2} = +0.28963$; Assuming the *ceteris paribus* principle (i.e., assuming an unchanged Money Supply and an unchanged Unemployment Rate), when the Real Effective Exchange Rate of Macedonian Denar increases by 1 percentage point [pp], the Inflation Rate will increase by 0.28963 [pp];
- $\widehat{\beta_3} = -0.11057$; Assuming the *ceteris paribus* principle (i.e., assuming an unchanged Money Supply and an unchanged Real Effective Exchange Rate of Macedonian Denar), if the Unemployment Rate increases by 1 percentage point [pp], the Inflation Rate will decrease by 0.11057 [pp].

As per the p-Values of the estimated OLS regression coefficients, the following conclusions can be drawn from the results shown in Figure 8:

- The first null hypothesis is $H_0: \widehat{\beta_1} = 0$; Since the p-Value of the estimated value of $\widehat{\beta_1}$ equals $0.737 > \alpha\ (0.05)$, the null hypothesis can be accepted, so it can be concluded that the coefficient is not statistically significant;
- The second null hypothesis is $H_0: \widehat{\beta_2} = 0$; Since the p-Value of the estimated value of $\widehat{\beta_2}$ equals $0.279 > \alpha\ (0.05)$, the null hypothesis can be accepted, so it can be concluded that the coefficient is not statistically significant;
- The third null hypothesis is $H_0: \widehat{\beta_3} = 0$; Since the p-Value of the estimated value of $\widehat{\beta_3}$ equals $0.340 > \alpha\ (0.05)$, the null hypothesis can be accepted, so it can be concluded that the coefficient is not statistically significant;

The coefficient of determination is $R^2 = 0.201 = 20.1\%$, as shown in Figure 8, which means that only 20.1% of the variability of the dependent variable Inflation Rate (Y) can be jointly explained by the variability of the three dependent variables Money Supply (X1), the Real Effective Exchange Rate of the Macedonian Denar (X2), and the Unemployment Rate (X3).

The null hypothesis of the F-test claims that the model as a whole is not statistically significant, i.e. H_0: $\beta_0 = \beta_1 = \beta_2 = \beta_3 = 0$. Since the p-Value of the F-test is 0.247 > α (0.05), as shown in Figure 8, the null hypothesis can be accepted, so it can be concluded that the OLS regression model as a whole is not statistically significant. This implies that there is no any contradiction between the individual hypothesis testing conducted previously and the F-test.

The diagnostic analysis of the model shows that the estimated coefficients of independent variables are not statistically significant, but the low coefficient of determination (R^2) indicates that there is no multicollinearity.

The Durbin-Watson statistics (DW-statistic) equals 1.4046, as indicated by Figure 8. For k = 3 (number of independent variables) and n = 22 (total number of observations), the critical values of the Durbin-Watson statistics equal $d_L = 1.05$ and $d_u = 1.66$. Since $d_L = 1.05$ < DW-statistic = 1.4046 < $d_u = 1.66$, the null hypothesis H_0, stating that there is no positive autocorrelation, can be neither accepted nor rejected, so a decision *vis-à-vis* the existence of autocorrelation cannot be made for sure.

The plot of residuals can reveal important insights about the behavior and quality of a regression model. The residual plot in Figure 9 shows that residuals are randomly dispersed around zero, indicating that the model is well-specified with no significant patterns remaining in the data, suggesting that the model effectively captures the underlying relationships. It shows that there is no nonlinearity, because there is no obvious systematic pattern, such as a curve or trend in the residuals. It also guarantees that there is no heteroscedasticity in the model.

CONCLUSION

The analysis of data for the period 2002–2023 in the Republic of North Macedonia reveals several insights into the factors influencing inflation. It was found that Money Supply (M2), the Real Effective Exchange Rate, and the Unemployment Rate are statistically insignificant determinants of the Inflation Rate during the observed period.

The Inflation Rate has demonstrated considerable volatility, ranging from −0.8% in 2009 to a peak of +14.2% in 2022. This substantial fluctuation indicates that inflation in North Macedonia is highly susceptible to various economic factors.

The Money Supply (M2) has experienced notable variability, with high growth rates observed in years like 2007 and 2008, contrasted by declines during economic crises, such as in 2009. This pattern suggests that monetary policy has played a significant role in shaping economic conditions, particularly inflation.

Similarly, the Real Effective Exchange Rate of the Macedonian Denar (MKD) has shown an overall upward trend, likely reflecting the gradual stabilization of the MKD against other currencies. Lastly, the Unemployment Rate has steadily declined over the observed period, potentially signaling improvements in country's labor market.

While multiple OLS linear regression is a powerful tool for modeling relationships between variables, it has several limitations and drawbacks that should be considered. For instance, OLS relies on several key assumptions, such as linearity, independence, homoscedasticity, and normality of residuals; violations of any of these assumptions can lead to biased or inefficient and inaccurate estimates. Next, when independent variables are highly correlated, it becomes difficult to isolate their individual effects, leading to inflated standard errors and unreliable coefficient estimates. Further on, OLS regression is sensitive to extreme values, which can disproportionally affect the model's coefficients and predictions. More important, if important explanatory variables are excluded from the model, the estimates of included variables may be biased and misleading. Last, but not least, OLS assumes a specific linear relationship between predictors and the dependent variable, which may not reflect reality.

According to the results of the multiple OLS linear regression model, the Money Supply (X1) exhibits a positive influence on the Inflation Rate (Y), aligning with established economic theory and practice. This relationship reflects the general trend where an increase in Money Supply correlates with higher inflation, though its magnitude and timing depend on factors such as economic conditions, money velocity, and the economy's production capacity. When Money Supply expands faster than the production of goods and services, it creates excess demand, leading to rising prices (demand-pull inflation). Conversely, a reduction in Money Supply tightens liquidity, curbing demand and inflation, though excessive tightening may result in deflation. On the other hand, the model results suggest that Real Effective Exchange Rate (REER) of the Macedonian Denar (variable X2) positively influences the Inflation Rate (variable Y), which defies the economic theory and practice: in real life, the REER and the inflation rate generally move in opposite directions. In reality, according to the National Bank of the Republic of North Macedonia, when the REER index increases, then the domestic currency (MKD) appreciates. This makes imports cheaper, reducing the overall cost of imported goods and services. Cheaper imports lower inflation directly (through reduced prices of imported goods) and indirectly (through competitive pressures on domestic producers). When the REER index decreases, the domestic currency (MKD) depreciates, and the domestic currency weakens. This increases the cost of imports, raising prices for consumers and businesses reliant on imported goods or inputs. This leads to imported inflation (higher prices for imported goods) and cost-push inflation (rising input costs for businesses). The results indicate that the Unemployment Rate (X3) negatively impacts the Inflation Rate (Y), aligning with both economic theory and empirical evidence. This inverse relationship, commonly described by the Phillips Curve, suggests that in the short term, lower unemployment leads to higher inflation, while higher unemployment reduces inflation. Specifically, as unemployment declines, labor markets tighten, causing employers to compete for workers by increasing wages. Higher wages boost consumer purchasing power and raise production costs, contributing to price increases (inflation). Conversely, rising unemployment eases wage pressures and dampens consumer demand, leading to slower price growth or even deflation. However, this relationship may vary in a long term or under unique economic conditions.

Future research directions may consider the inclusion of additional, yet more important/relevant explanatory variables in the model and/or appliance of more sophisticated methodologies for modeling the impact of various dependent variables on the inflation rate.

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