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THE INFLUENCE OF MACROECONOMICS VARIABLES ON THE INFLATION LEVEL IN INDONESIA: ERROR CORRECTION MECHANISM APPROACH

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Abstract

Fluctuations in the inflation rate in Indonesia are something that the government must continue to pay attention to because high inflation rates can reduce people's purchasing power and increase the cost of living. This research aims to see the influence of macroeconomic variables such as the exchange rate, money supply, interest rates, Gross Domestic Product (GDP), and the value of imports on inflation in Indonesia from 2003 to 2023. This research is quantitative research using time series data from 2003 to 2023. Data was analyzed by Error Correction Mechanism (ECM) and taken from Badan Pusat Statistik and Bank Indonesia and data processed by using the Eviews 10 application. The research results show that in the long term the reference interest rate has a significant positive influence on inflation in Indonesia. Meanwhile, in the short term, the benchmark interest rate and GDP have a significant positive influence on the inflation rate in Indonesia

Keywords: *inflation; exchange rate; gross domestic product; interest rate; money supply*

A. INTRODUCTION

Inflation is a problem that is often faced by almost all countries in the world. Inflation is still an interesting topic to discuss because inflation itself can reduce people's purchasing power and increase the cost of living. Inflation can also be associated with increasing prices of goods or services in general in response to economic activities occurring in a country(Prayogi, 2022). So the rate of inflation growth must be maintained to avoid economic instability (Anjalya et al., 2022).

The inflation rate in Indonesia experiences continuous fluctuations. In 2005, inflation occurred because of the government reducing fuel subsidies which caused inflation reach 17%. Apart from this, the global crisis felt throughout the world caused the inflation rate to reach 11% in 2008. Meanwhile, in 2022, Indonesia will again face inflationary pressures triggered by the global economic crisis due to rising food commodity prices. From these inflation conditions, it appears that Indonesia still needs to continue to control the low inflation rate.

Bank Indonesia stated that inflation could occur because the exchange rate experienced a decrease in value (depreciation) (Mufarrikhah & Hayati, 2021). Currency depreciation causes the price of imported goods to become expensive to

buy, this can causes inflation occurs (Sari & Nurjannah, 2023). So if a country relies excessively on imports it can cause vulnerability to price fluctuations of imported goods and disruption of the domestic price balance.

Inflation is closely linked to an excessive amount of money circulating in society (Rafdiansyah et al., 2024). When there is too much money in circulation, aggregate demand increases, which in turn raises the prices of goods and services (Fauzi Aziz & Yanto, 2023). This situation enables the government to take action against inflation by regulating interest rates. When inflation is high, the government typically raises interest rates. This policy encourages cash holders to keep their money in the bank, while potential investors may decide against borrowing capital from banks (Rahayu & Hutajulu, 2023). Inflation is also closely related to high GDP values. There is a relationship between inflation and GDP. A country needs a high inflation rate to trigger producers to continue producing goods so that national output continues to increase. However, if it is not controlled, then inflation will become a problem (Khotimah et al., 2017).

So far, previous research has not analyze in detail at the influence of macroeconomic variables on inflation, both in terms of independent variables and the length of the research period. First, this previous studies that only use the BI Rate, Exchange Rate and Circular Money in their research (Simon, 2023). This research is only limited to those three variables and only limited to Covid period. Second, another research using money supply, exports and interest rates as independent variables (Kevin & Abidin, 2023). Apart from that, this research was also limited to only two years, which did not provide maximum results. Third, previous research was only limited to a short period of time, so it did not provide a complex picture of inflation developments in Indonesia such as the research conducted by (Rumasoreng et al., 2023),(USMAN et al., 2020), and (Anggraeni & Dwiputri, 2022).

This paper is present to complete the shortcomings that exist in previous research regarding inflation problems. This article tries to dig deeper into the causes of inflation in Indonesia. The addition of import value and GDP variables in this research is expected to be able to map the causes of inflation in Indonesia in more detail. Apart from this, the long research period starting from 2003 to 2004 is expected to provide more accurate results compared to the previous research.

In line with this, the question that can be asked in this research is finding the influence of macroeconomic variables such as the exchange rate, money supply, interest rates, GDP, and the value of imports on inflation in Indonesia during the period 2003 to 2023. The answer to this question will provide benefits for Indonesia to pay attention to variables that have a significant influence on the inflation rate.

B. LITERATURE REVIEW

Inflation is considered a general monetary phenomenon, so measures taken to address inflation include demand-side management by regulating the availability of money in circulation. Monetary economists argue that the money supply should be regulated at stable prices. They believe that inflation occurs when growth in the money supply exceeds the demand for money (S.M. Juhro et al., 2025). Many different findings studying the phenomenon of inflation. As found, there is a positive reaction of inflation to interest rate, robus test indicates that interest rates negatively impact inflation expectations in the long run (Osorio-Barreto et al., 2025). They also

found a follow-on effect, a positive reaction of inflation expectations to real exchange rate shocks and an inertia of inflation expectations to their own innovations. Inflation is also significantly influenced by exchange rate and interest rates in short-term movements, and there is found a long run cointegration relationship between prices, interest rates, and economic activity (Zack et al., 2023). Besides, inflation is also influenced by economic production gap (Akbaş et al., 2024). Only a few studies have investigated the influences of macroeconomic variables on Inflation. (Ridwan, 2022) has investigated the determinants of inflation rates based on macroeconomics perspective but it only focusses on monetary sides. Therefore, this research attempts to examine the real sector by examining the GDP's variable as macroeconomics' variable.

C. METHOD

This research uses a quantitative research approach. This research also uses time series secondary data from 2003 to 2023 (21 years). In this research, the independent variables are the exchange rate (Rupiah), Money Supply (Rupiah), Gross Domestic Product (Rupiah), BI Interest Rate (Percent), and Import Value (Rupiah). Meanwhile, the dependent variable in this research is inflation (percent). Exchange Rate, BI Rate, and Inflation data are taken from Bank Indonesia. While data on import value, Gross Domestic Product and Money Supply is accessed from Badan Pusat Statistik Indonesia. The data analysis method in this research is the Error Correction Mechanism (ECM) method which is processed by using the Eviews 10 application

D. RESULT AND DISCUSSION

This research uses an error correction mechanism (ECM). The use of the ECM method in this research is because the ECM method is able to overcome problems with non-stationary data and avoid spurious regression (Mufarrikhah & Hayati, 2021). The ECM method is also able to analyze long-term and short-term relationships (Martanto et al., 2021).

The first step in using the ECM method is to ensure that all variables are stationary. Based on processed data, all variables are stationary at the second difference stage. This can be seen in table 1.

Table 1. Unit Root Test Results

Variabel	UJI AKAR UNIT								
	Level			First Difference			Second Difference		
	ADF	Prob	Kesimpulan	ADF	Prob	Kesimpulan	ADF	Prob	Kesimpulan
Inflasi	-2.781741	0.0787	Tidak Stasioner	-6.683074	0.0000	Stasioner	-3.847681	0.0132	Stasioner
JUB	-2.183007	0.2183	Tidak Stasioner	-0.948017	0.7428	Tidak Stasioner	-7.014831	0.0000	Stasioner
Kurs	-3.301535	0.0287	Stasioner	-3.475910	0.0224	Stasioner	-13.54602	0.0000	Stasioner
PDB	-1.232973	0.6387	Tidak Stasioner	-4.193527	0.0050	Stasioner	-5.622141	0.0003	Stasioner
SBA	-1.977363	0.2934	Tidak Stasioner	-4.205266	0.0008	Stasioner	-4.205266	0.0063	Stasioner
Impor	-1.935706	0.3105	Tidak Stasioner	-6.546772	0.0000	Stasioner	-3.950720	0.0094	Stasioner

Source: Data is processed, 2025

It can be seen from the table 1 above that all variables are stasioner in the second difference. The next step is analyse the data by using cointegration test by looking at the ECT value which must have a negative sign. In this study, ECT is -2,37, which means that there is a long-term and short-term relationship between the independent variable and the dependent variable. The table 2 is the long-term regression results in this study.

Table 2. Long Term Regression Results

Dependent Variable: INFLASI
Method: Least Squares
Date: 11/06/24 Time: 18:41
Sample: 2003 2023
Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
KURS	-0.538842	0.283892	-1.898056	0.0771
JUB	-0.425807	0.307172	-1.386220	0.1859
IMPOR	0.333023	0.324001	1.027845	0.3203
PDB	0.330408	0.302171	1.093446	0.2914
SBA	1.376766	0.372220	3.698796	0.0021
C	1.608309	2.528233	0.636140	0.5343

R-squared	0.776070	Mean dependent var	-3.078095
Adjusted R-squared	0.701427	S.D. dependent var	0.591562
S.E. of regression	0.323241	Akaike info criterion	0.814117
Sum squared resid	1.567267	Schwarz criterion	1.112552
Log likelihood	-2.548224	Hannan-Quinn criter.	0.878885
F-statistic	10.39706	Durbin-Watson stat	2.439487
Prob(F-statistic)	0.000187		

Source: Data is processed, 2025

From table 2 above, it can be concluded that only the interest rate variable has an influence on inflation in Indonesia. This can be seen from the prob value 0,0021<0,05. Meanwhile, in a long term, the other independent variables have no influence on inflation in Indonesia from 2003 to 2023. Next, we will look at the short-term regression results in the following table 3.

Table 3. Short Term Regression Results

Dependent Variable: D(INFLASI,2)
Method: Least Squares
Date: 11/06/24 Time: 18:40
Sample (adjusted): 2005 2023
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(KURS,2)	-0.387045	0.320244	-1.208594	0.2501
D(JUB,2)	-0.952689	1.028147	-0.926607	0.3724
D(PDB,2)	0.650643	0.156744	4.150996	0.0013
D(SBA,2)	1.380919	0.233450	5.915278	0.0001
D(IMPOR,2)	0.093304	0.391776	0.238156	0.8158
ECT(-1)	-2.373494	0.248683	-9.544269	0.0000
C	-0.015709	0.063159	-0.248714	0.8078

R-squared	0.963599	Mean dependent var	-0.050526
Adjusted R-squared	0.945399	S.D. dependent var	1.165220
S.E. of regression	0.272275	Akaike info criterion	0.513301
Sum squared resid	0.889603	Schwarz criterion	0.861252
Log likelihood	2.123644	Hannan-Quinn criter.	0.572188
F-statistic	52.94425	Durbin-Watson stat	1.683035
Prob(F-statistic)	0.000000		

Source: Data is processed, 2025

By comparing those two regressions results above, we can see several differences, namely, in the long-term regression results, only the interest rate variable has an influence on inflation in Indonesia.

This researches find that exchange rates do not influence the inflation rate in either the short term or the long term. While some previous studies show that exchange rates can have a short-term impact on inflation. This finding research could also illustrate the reality, that exchange rate does not influence the inflation because price control and effective monetary policy which implemented by the government. This finding in line with the previous findings which found that exchange rate do not influence the inflation rate (Sari & Nurjannah, 2023), (Muchtaram, 2020) and (Fidia et al., 2022)

Furthermore, the regresion results have shown that the value of imports has no impact on inflation, both in the long term and the short term. Previous research also supports the idea that imports do not influence inflation (Jumhur et al., 2018) and (Wulandari & Laut, 2023). This could happen if the import price is stable, and a country could provide a sufficient supply, or it could happened from government-imposed import price controls.

Previous study found that the money supply positively influences inflation because it reflect a society's purchasing power (Khoirony et al., 2024). This research found that money supply also has no influence on inflation, either short or long term. This can be caused by the very tight monetary policy implemented by the central

bank (Maisyuri et al., 2023; Susmiati et al., 2021)

Meanwhile, short-term regression results show that the interest rate and gross domestic product variables have an influence on the inflation rate in Indonesia. Where the interest rate value is < 0.0001 < 0.05 and the GDP prob value is 0.13 < 0.05. The adjusted r square value in the long-term regression is 0.70, while the adjusted r squared value in the short-term regression is 0.94.

These findings are interesting to discuss, the BI Rate in fact certainly has a big influence on the inflation rate in Indonesia. Inflation is often associated with the large amount of money circulating in society. So the government often takes policies to increase the BI rate. With the increase in the BI Rate, people tend to choose to save their money in banks in the hope of getting a higher return compared to saving it in cash. Vice versa, if inflation falls, the BI Rate tends to fall so that people prefer to allocate their money for investment rather than saving in banks. Besides, the correlation between BI Rate and Inflation in Indonesia influenced by many various variables such as monetary policy and economic uncertainty(Nadiah & Rosyidi, 2019).

Furthermore, a previous research show that GDP has a negative influence on inflation (Ifdaniyah & Syafri, 2024) and (Darmayanti, 2014). When inflation rate increase, it will decrease people purchasing power and decrease national output. In this research, in the short-term GDP has a significant positive influence on the inflation rate in Indonesia but in a long term, GDP has no influence on the inflation rate. GDP is an indicator that is often used to assess the prosperity of a country. The increase in GDP in numbers can be associated with an increase in people's income in that country. So that an increase in people's income will cause an increase in demand or purchasing power, thereby increasing the inflation rate. If this happens then the government should adopt an economic stabilization policy (Siswoyo & Asrini, 2020).

E. CONCLUSION

This research finds that in the short term, interest rates and gross domestic product have a positive influence on inflation in Indonesia. Meanwhile exchange rate, GDP, and money supply have no influence on inflation in Indonesia both in long term and short term. However, in the long term, only the interest rate variable has an influence on the inflation rate in Indonesia. This finding has the implication that interest rates must remain monitored and controlled through appropriate policies. However, there are several limitations in this research, namely that there are still several independent variables that have not been included, such as investment and exports

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