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Analysis Of The Influence Of Exports, Imports, And The Amount Of Currency In Circulation On Inflation In Indonesia From 1991 To 2022 Using Error Correction Model (ECM)

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Abstract:

High inflation can have a negative impact on the economy. Based on the economic conditions in Indonesia, the rate of inflation experiences fluctuations each year due to various factors. This research aims to analyze the influence of exports, imports, and the amount of currency in circulation on inflation in Indonesia. It is a quantitative study utilizing time series data from 1991 to 2022. Data analysis is conducted using the Error Correction Model (ECM) to examine the long-term and short-term effects of the observed variables. The results indicate that exports have a positive and significant impact on inflation in the long term but not significantly in the short term. On the other hand, imports and the amount of currency in circulation have a significant influence on the inflation rate in Indonesia, both in the long and short terms. Simultaneously, exports, imports, and the amount of currency in circulation significantly affect the inflation rate in Indonesia, both in the short and long terms.

Keywords: *Exports, Imports, Inflation, Money Supply, ECM*

1. Introduction

Two crucial elements for measuring a country's macroeconomic performance are inflation and exchange rates. Economic growth fluctuations are caused by foreign currency exchange rates and increases in the prices of goods and services. The primary concern across all countries since the 1970s has been price instability (Abubakar, Apeh, and Nweze, 2021).

There are various ways to define inflation among economists. Economists generally agree that inflation refers to a general increase in prices. Pigou (1947) defined inflation as the tendency for prices to continuously or persistently increase (Ofori-Frimpon et al., 2017). The real sector, such as exports and imports, as well as the financial sector, play significant roles in influencing a country's inflation rate (Elva Dona et al., 2022).

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Based on the economic conditions in Indonesia, the inflation growth rate experiences both increases and decreases annually. The inflation rate in Indonesia from 1991 to 2022 is depicted in the following graph.

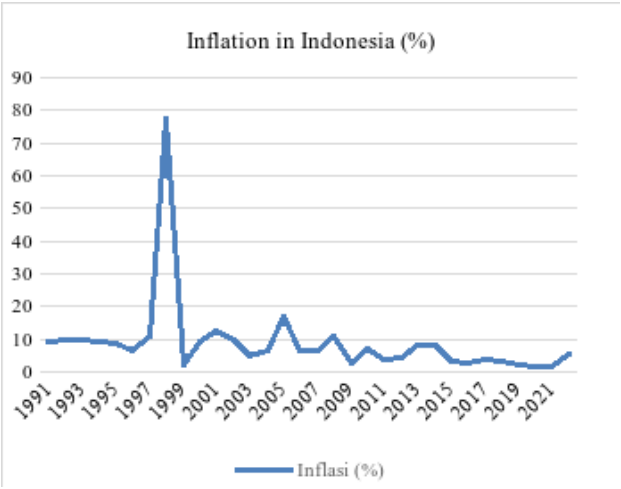

Figure 1. Inflation (%) in Indonesia Based on CPI 1991-2022
Source: BPS (Central Bureau of Statistics) and BI (Bank Indonesia), processed

Figure 1 indicates that the inflation rate in Indonesia reached its lowest point in 2020, standing at 1.68%. The highest inflation rate (hyperinflation) occurred in 1998 at 77.6%. The inflation crisis in 1998 led to various social, political, and economic tragedies across the country. Following the monetary crisis, inflation rates were relatively controlled due to good synergy between Bank Indonesia and the Government.

In recent years, Indonesia's inflation rate has fluctuated. Low inflation rates signify stable economic growth, while high inflation rates can weaken people's purchasing power and create uncertainties in daily life (Rizani et al., 2023).

Indonesia's economy operates as an open economy (Sukirno, 2011), engaging in both exports and imports of goods, services, and capital with other countries. International trade is one of the activities within an open economic system. Indonesia's economy can further develop through export and import activities (Indah et al., 2022). Improvements in various sectors have contributed to the growth of Indonesia's economy. On the expenditure side, household consumption has significantly increased by 5.51%, supported by robust export performance at 19.74% (Harsono, 2023).

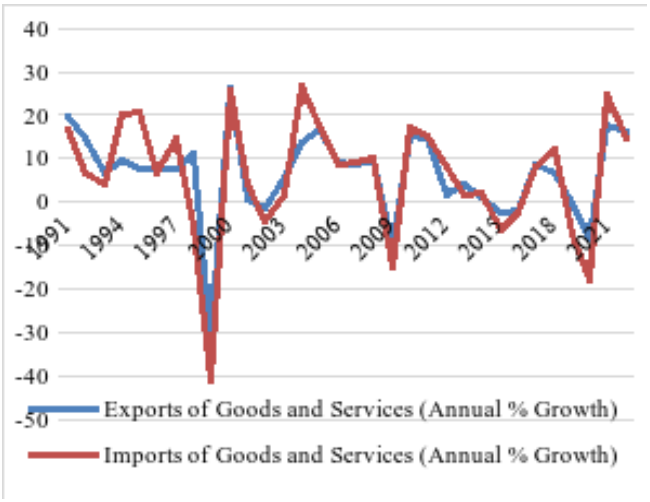

Figure 2. Export and Import Growth in Indonesia from 1991 to 2022
Source: World Bank, processed

Between 1991 and 2022, the annual growth percentages of exports and imports in Indonesia fluctuated, aligning with the fluctuating inflation rates in the country. Exports can influence inflation through the supply of goods and services that become part of domestic consumption. Import activities can directly impact the inflation price index. Additionally, imports can indirectly affect inflation through price competition between domestic and imported products (Purwanti et al., 2014).

Issues arise when high exports do not correspond to a decrease in inflation or when high imports do not lead to increased inflation. According to theory, if there's an excess of domestically produced goods for export, domestic product prices should be low. In other words, the higher the export value, the lower the inflation rate. However, even though Indonesia's exports were higher in 2013 than in 2014, the inflation rate had actually increased. The same phenomenon occurred with imports in Indonesia. The higher the value of imported goods, the lower the inflation rate (Ulfa & Abbas, 2020).

There are differing views on the factors determining inflation rates. However, experts generally agree that long-term inflation is primarily caused by an increase in the money supply growing faster than economic growth (Ofori et al., 2017). A continuously increasing money supply will lead to increased prices of goods and services, especially if output growth has reached its maximum level (Jumhur et al., 2018).

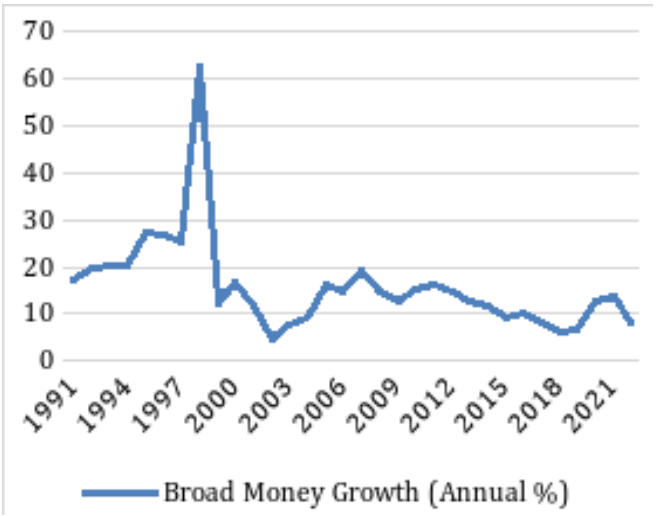

Figure 3. Growth of Money Supply (%) in Indonesia from 1991 to 2022
Source: World Bank, processed

Figure 3 shows that the growth of the money supply in Indonesia reached its highest point in 1998, at 62.76%. During that year, there was a monetary crisis accompanied by a very high inflation rate.

Irving Fisher's Quantity Theory of Money posits that inflation is caused by the amount of money, assuming a constant velocity of money circulation and the volume of goods traded. However, Keynes refuted this theory. He expressed that the quantity of money is not the sole cause of inflation. Keynes argued that inflation stems from people's desire to live beyond their means (Harsono, 2023).

Based on these phenomena, various research results have emerged regarding the influence of exports, imports, and the money supply on inflation. Therefore, the author is interested in analyzing the long-term and short-term relationships between exports, imports, and the money supply's impact on the inflation rate in Indonesia from 1991 to 2022, using the Error Correction Model (ECM).

2. Theoretical Background

Inflation

According to Sukirno (2002), inflation is a tendency of general and continuous price increases. Inflation is measured based on the average price level, so if the price of a particular item continuously rises or falls without altering the average price level of all items, it is not considered inflation (Saiyed, 2021).

Inflation is an integral part of macroeconomic implementation and a crucial variable in explaining financial approaches. It refers to a financial situation where costs generally increase. Inflation is the rate of change in the cost level at a specific point in time compared to historical cost levels (Darmawan et al., 2023).

The main types of inflation are divided into two categories: demand-pull inflation and cost-push inflation. Demand-pull inflation is caused by demand-side factors such as an increase in the money supply, government spending hikes, and export growth. On the other hand, cost-push inflation is a type of inflation primarily stemming from supply-side factors (Yahya & Pamuncak, 2023).

Export

Export refers to the sale of goods to foreign countries, involving quality, quantity, payment systems, and sales terms agreed upon between the exporter and importer (Silitonga, 2017). Exportation provides a positive contribution to a country's economy; the larger the exports, the higher the level of economic activity achieved (Ilmas et al., 2022).

Import

According to Sukirno (2006), import is the act of buying or bringing goods from foreign countries into the domestic market. A country imports goods that involve factors of production that are either not available or are scarce within that country (Putra, 2022). Through imports, a country can fulfill the needs of its population with goods/services that cannot be produced domestically, thereby reducing the production costs of goods and services (Ningsih & Harningtias, 2023).

Money Supply

The Money Supply (MS) represents the total amount of money circulating and held by the public within an economy at a specific time (Raharja, 2008). Inflation and the money supply have a relationship explained by the quantity theory of money. According to Fisher, changes in the circulating money supply (M) correspond with changes in prices (P) (Herania & Maski, 2022).

The Impact of Exports on Inflation

Several studies indicate that exports have a negative impact on inflation because they can increase the supply of foreign currency and reduce demand for domestic currency, thereby potentially lowering the inflation rate (Kokala Abdullah et al., 2018). Research by Purusa and Istiqomah (2018) also shows that inflation has a negative and significant influence on exports.

While some studies suggest that exports can have a negative impact on inflation, others demonstrate a positive influence. Research by Elva Dona et al. (2022) and Jumhur et al. (2018) utilizing multiple linear regression analysis indicates that exports have a positive and significant impact on inflation in Indonesia. Exports affect product availability for domestic consumers, potentially influencing prices in the domestic market.

Studies examining the dynamic relationship between exports, imports, and inflation in India found that exports have a positive impact on inflation (Sahoo and Sethi, 2018). Research by Rehman & Khan (2015) on factors influencing food inflation in Pakistan from 1990 to 2013 using Vector Error Correction models suggests that food exports have a positive and significant long-term impact on food inflation in Pakistan.

Overall, the relationship between exports and inflation in Indonesia is highly complex and influenced by various factors. The varied results stem from the lack of consensus regarding the relationship between exports and inflation. Previous studies mostly focused on total exports without considering domestic export components and re-exports, making their specific impact on inflation uncertain. Therefore, this research aims for a comprehensive analysis to examine the relationship between exports, using the annual export growth (%) variable, and inflation (%) through the Error Correction Model (ECM).

The Impact of Imports on Inflation

Based on research by Rangkuty & Nasution (2018), an increase in imports has a positive impact on inflation according to the VAR equation. There exists a long-term equilibrium stability and movement between inflation and imports. In the short term, inflation and imports adjust to each other to achieve long-term equilibrium.

Research by Yeboah et al. (2015) indicates a negative relationship between imports and inflation in Ghana. Additionally, studies by Sari and Hasmarini (2023), Purwanti et al. (2014), and Elva Dona et al. (2022) show that imports can significantly and negatively affect the inflation rate in Indonesia. A general increase in imports is followed by a decrease in the inflation rate.

However, according to Cahyani (2023), if imports exceed exports, it indicates inflation and can influence a country's economic growth. Therefore, a healthy and developing economy is one that exports more than it imports, yet currently, Indonesia tends to export raw materials and import finished goods.

Based on previous research, this study attempts a comprehensive analysis to examine the relationship between imports and inflation using the annual import growth (%) variable through the Error Correction Model (ECM).

The Impact of Money Supply on Inflation

Research by Jumhur et al. (2018) shows that the money supply has a positive and significant impact on inflation in Indonesia from 1965 to 2016, meaning that an increase in the money supply is followed by higher prices of goods and services. Adhista's study (2022) similarly indicates that in the long and short term, the money supply (M2) can affect the exchange rate of the rupiah. Adekantari et al. (2022) demonstrate that variables like economic growth and broad money have a positive and significant impact on inflation in ASEAN-5. Conversely, narrow money has a non-significant negative effect on inflation in ASEAN-5.

However, Dewi & Laut's study (2022) suggests no significant impact between the money supply and inflation in Indonesia during the 2015-2019 period. Given the varied results from research on the impact of the money supply on inflation, studies aim to provide a comprehensive understanding of the relationship between the money supply and inflation in Indonesia. In this study, the Money Supply variable utilizes Broad Money Growth (annual %) obtained from World Bank data.

3. Methodology

This research employs a quantitative approach utilizing the Error Correction Model (ECM) assisted by Eviews 10 software. The data used consists of a 32-year time series from 1991 to 2022. The ECM model aims to evaluate the long-term and short-term effects of several independent variables on a dependent variable.

The independent variables utilized in this study include Exports (X1) using annual growth data of Goods and Services Exports (%), Imports (X2) employing annual growth data of Goods and Services Imports (%), and Broad Money Supply (X3) utilizing Broad Money Growth (%) data — all obtained from the World Bank. The dependent variable in this study is Inflation (Y) utilizing annual Inflation rate (%) data from the Central Statistics Agency (BPS) and Bank Indonesia.

According to Sargan, Engle, and Granger, the Error Correction Model is a technique to correct short-term imbalances toward long-term equilibrium. This model also explains the relationship between dependent and independent variables in both the present and past periods. The steps involved in estimating the ECM model encompass unit root testing (stationarity test), cointegration test, and ECM estimation for both short and long terms.

The econometric model for the long-term regression is as follows:

$$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \varepsilon i \qquad (1)$$

Meanwhile, the short-term regression model is expressed in the following equation:

$$D(Y) = \beta 0 + \beta 1 D(X1) + \beta 2 D(X2) + \beta 3 D(X3) + ECT(-1) + \varepsilon i \quad (2)$$

Where:

Y	= Inflation (%)
β0	= Constant
β1	= Regression coefficient of variable X1
β2	= Regression coefficient of variable X2
β3	= Regression coefficient of variable X3
X1	= Exports (Pertumbuhan Tahunan %)
X2	= Imports (Pertumbuhan Tahunan %)
X3	= Money Supply (Growth %)
εi	= *Error term*
D	= Change
ECT	= Error Correction Term

Stationarity test, such as the Augmented Dickey-Fuller (ADF) test, is employed to observe the presence of a unit root in a time series data. This test examines stationarity at the level, first difference, and second difference levels.

According to Granger (Gujarati, 2003), the initial or pre-test to anticipate the occurrence of spurious regression involves conducting a cointegration test. The purpose of the cointegration test is to observe the long-term equilibrium among various economic factors that influence multiple economic activities (Puspita Agustin, 2021). In this research, the Johansen cointegration test is performed.

Subsequently, classical assumption tests are conducted, encompassing tests for normality, autocorrelation, multicollinearity, and heteroskedasticity. This is followed by regression analysis using the ECM (Error Correction Model) and testing for the coefficient of determination or R-squared.

4. Empirical Findings/ Result

Unit Root Test (Stationarity Test)

Unit Root Test (Stationarity Test) The stationarity test in this study was conducted using the Augmented Dickey Fuller test. Its purpose was to examine the presence of unit roots in each variable. The stationarity test was initially performed at the level, then using the first difference, and so forth. Data that exhibit stationarity are indicated by probability values smaller than α 1%, 5%, and 10%.

Table 1. Stationarity Test Results

Variabel	Level		1st Difference	
	Sig.	Interpretation	Sig.	Interpretation
Inflation (Y)	0.7004	Not Stationary	0.0276	Stationary
Exports (X1)	0.0000	Stationary	0.0001	Stationary
Imports (X2)	0.0004	Stationary	0.0002	Stationary

Money Supply (X3)	0.0084	Stationary	0.0000	Stationary

Source: Data processed using Eviews 10

The results of the stationarity test in Table 1 indicate that only the inflation variable (Y) is not stationary at the level, while at the first difference level, all independent and dependent variables are stationary. The significance values for each variable are less than α 5% (<0.05), specifically for the inflation variable (Y) at 0.0276, exports (X1) at 0.0001, imports at 0.0002, and money supply (X3) at 0.0000.

Cointegration Test

According to Gujarati (2003), the cointegration test is a method used to examine the degree of relationship between economic variables in the long term. If cointegration occurs among variables, the Error Correction Model (ECM) method can be applied. This research employs the Johansen cointegration test with testing criteria: if the Trace Statistic value is greater than the Critical Value at a significance level of 0.05, then the variables in this study are cointegrated.

Table 2. Cointegration Test Results

Hypothe-sized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob. **
None *	0.609627	67.66175	47.85613	0.0003
At most 1	0.501294	39.44218	29.79707	0.0029
At most 2	0.372479	18.57001	15.49471	0.0166
At most 3	0.141889	4.590646	3.841466	0.0321

Source: Data processed using Eviews 10

Based on the table above, the Trace Statistic value (67.66175) is greater than the Critical Value (47.85613), indicating that all variables in this study are cointegrated. This suggests a long-term balanced relationship among the variables.

Error Correction Model (ECM)

Long-Run Estimation

The long-term Error Correction Model (ECM) test is conducted using the Ordinary Least Squares (OLS) method. The OLS method is capable of estimating the relationship or association between research variables in the long term.

Table 3. Long-Term Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.

C	-7.561765	2.147859	-3.520605	0.0015
EKS	0.596378	0.270212	2.207077	0.0357
IMP	-0.476220	0.199943	-2.381774	0.0243
JUB	0.988884	0.121047	8.169423	0.0000

R-squared	0.780734	Mean dependent var	9.005625
Adjusted R-squared	0.757242	S.D. dependent var	13.03897
S.E. of regression	6.424368	Akaike info criterion	6.674542
Sum squared resid	1155.630	Schwarz criterion	6.857759
Log likelihood	-102.7927	Hannan-Quinn criter.	6.735273
F-statistic	33.23301	Durbin-Watson stat	1.422447
Prob(F-statistic)	0.000000		

Source: Data processed using Eviews 10

The long-term estimation results in Table 3 indicate that the variables Export (X1) and Broad Money (X3) have a significant and positive impact on Inflation (Y) in Indonesia at a 5% significance level, with respective probabilities of 0.0357 and 0.0000, both smaller than 5% (<0.05). Meanwhile, the variable Import (X2) shows a significant and negative impact on Inflation (Y) with a probability of 0.0243, also less than 5% (<0.05).

The model for the long-term relationship based on the above test results is:

$$INF = \beta 0 + \beta 1EKS + \beta 2IMP + \beta 3JUB + \varepsilon i \qquad (1)$$

$$INF = -7{,}561765 + 0{,}596378EKS - 0{,}476220IMP + 0{,}988884JUB + \varepsilon it \qquad (1)$$

The interpretation of this equation is as follows:

1. The constant value (β0) is negative at -7.562. This implies that if all independent variables, including Export (X1), Import (X2), and Broad Money (X3), remain unchanged (with a value of 0), the Inflation (Y) would be at -7.562.
2. The long-term regression coefficient value for the variable Export (X1) is a positive 0.596. This value indicates that if the Export variable (X1) increases by 1 unit (assuming other variables remain constant), the Inflation (Y) will increase by 0.596.
3. The long-term regression coefficient value for the variable Import (X2) is a negative 0.476. This value suggests that if the Import variable (X2) increases by 1 unit (assuming other variables remain constant), the Inflation (Y) will decrease by 0.476.
4. The long-term regression coefficient value for the variable Broad Money (X3) is a positive 0.99. This value indicates that if the Broad Money variable (X3) increases by 1 unit (assuming other variables remain constant), the Inflation (Y) will increase by 0.99.

Residual ECT

Table 4. Results of Stationarity Test
Residual Data ECT

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.618678	0.0012
Test critical values:	1% level	-3.724070	
	5% level	-2.986225	
	10% level	-2.632604	

*MacKinnon (1996) one-sided p-values.

Source: Data processed using Eviews 10

Based on table 4, the ECT residuals are already cointegrated, as the probability value of 0.0012 is less than α 5% (0.0012 < 0.05). This indicates that the stationary test results for the ECT residual data are stationary at the level. Furthermore, the t-statistic coefficient has a negative value of -4.618678. This signifies that an ECM analysis for the short term can be conducted.

Short-Term Estimation

Table 5. Short-Term Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.229408	1.050815	0.218314	0.8289
D(EKS)	0.375137	0.197556	1.898889	0.0687
D(IMP)	-0.320575	0.150643	-2.128047	0.0430
D(JUB)	1.261138	0.129100	9.768670	0.0000
ECT(-1)	-0.531119	0.200969	-2.642788	0.0137
R-squared	0.916608	Mean dependent var		-0.129355
Adjusted R-squared	0.903779	S.D. dependent var		18.84864
S.E. of regression	5.846759	Akaike info criterion		6.516342
Sum squared resid	888.7994	Schwarz criterion		6.747630
Log likelihood	-96.00330	Hannan-Quinn criter.		6.591736
F-statistic	71.44547	Durbin-Watson stat		1.671001
Prob(F-statistic)	0.000000			

Source: Data processed using Eviews 10

The short-term estimation results in Table 5 show that the Import variable (X2) has a negative and significant influence, while the Money Supply variable (X3) has a positive and significant effect on Inflation (Y) in Indonesia at a 5% significance level,

with respective probabilities of 0.0430 and 0.0000, both less than 5% (<0.05). Meanwhile, the Export variable (X1) has a positive but insignificant impact on Inflation (Y) with a probability of 0.0687, greater than 5% (>0.05). The probability value of the Residual ECT is also significant, which is 0.0137 < 0.05.

Based on the test results, the short-term relationship model is as follows:

$$D(INF) = \beta 0 + \beta 1 D(EKS) + \beta 2 D(IMP) + \beta 3 D(JUB) + ECT(-1) + \varepsilon i \quad (2)$$

$$D(INF) = 0{,}229408 + 0{,}375137 D(EKS) - 0{,}320575 D(IMP) + 1{,}261138 D(JUB) - 0{,}531119 + \varepsilon it \quad (2)$$

Here's the interpretation of the equation:

1) The constant value (β0) is positive at 0.229. This means that if all independent variables, including Export (X1), Import (X2), and Money Supply (X3), remain unchanged or at 0, the value of Inflation (Y) will be 0.229.
2) The short-term regression coefficient for the Export variable (X1) is positive at 0.375. This value indicates that if the Export variable (X1) increases by 1 unit (assuming other variables remain constant), the Inflation (Y) variable will increase by 0.375.
3) The short-term regression coefficient for the Import variable (X2) is negative at -0.321. This value suggests that if the Import variable (X2) increases by 1 unit (assuming other variables remain constant), the Inflation (Y) variable will decrease by 0.321.
4) The short-term regression coefficient for the Money Supply variable (X3) is positive at 1.261. This value implies that if the Money Supply variable (X3) increases by 1 unit (assuming other variables remain constant), the Inflation (Y) variable will increase by 1.261.
5) The Error Correction Term (ECT) has a negative regression coefficient of -0.531. This indicates a potential short-term instability or deviation between the independent and dependent variables. Therefore, the ECT of 0.531 has been corrected to establish long and short-term balance or equilibrium between the independent and dependent variables.

Coefficient of Determination (R^2)

The coefficient of determination (R^2) explains the proportion of total variance in the dependent variable explained by the independent variables together. The R^2 value in the long-term estimation result is 0.780734, indicating that the independent variables collectively explain 78.1% of the dependent variable, while the remaining 21.9% is explained by other factors or variables outside the model.

The R^2 value from the short-term estimation result is 0.916608, suggesting that the independent variables explain 91.7% of the dependent variable, while the remaining 8.3% is explained by other variables outside the model.

Classical Assumptions

The results of the classical assumptions test help determine whether the data used in statistical analysis meets basic assumptions or not. If the data does not meet these assumptions, data transformation or the use of more appropriate statistical analysis methods may be necessary. This test includes assessing normality, autocorrelation, multicollinearity, and heteroskedasticity.

Normality Test

The normality test aims to determine if the residual values have a normal distribution. The Jarque-Bera test is used for normality testing. A regression model is considered good if the obtained residual values have a normal distribution. If the significance value is > 0.05 (α = 5%), it indicates that the residual values are normally distributed.

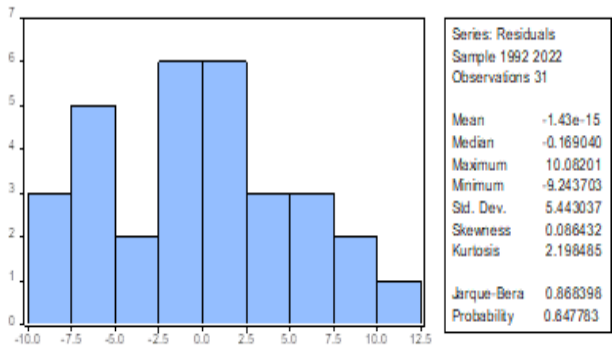

Figure 4. Normality Test Results

Source: Data processed using Eviews 10

Based on the normality test results above, it shows that the probability value is 0.647783, which is greater than the 5% significance level (>0.05). The Jarque-Bera statistic is 0.868396. The chi-square value at a probability level (df) of 2 for α = 0.05 is 5.99146. The Jarque-Bera value is smaller than the chi-square value (0.868396 < 5.99146). Therefore, it can be concluded that the regression model uses data that are normally distributed.

Autocorrelation Test

The autocorrelation test aims to determine whether there is a relationship between the error term in a specific period and other periods (preceding periods). The Breusch-Godfrey Serial Correlation LM Test is used in this research. A regression model is

considered free from autocorrelation if the Chi-Square probability value is greater than 5% significance level.

Table 6. Autocorrelation Test Results

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.153523	Prob. F(2,24)	0.1380
Obs*R-squared	4.716791	Prob. Chi-Square(2)	0.0946

Source: Data processed using Eviews 10

That means that based on the autocorrelation test results, with a Chi-Square probability value of 0.0946 being greater than the significance level of 0.05 (0.0946 > 0.05), it indicates that the model is free from autocorrelation.

Multicollinearity Test

The multicollinearity test aims to determine if there is perfect correlation among independent variables in the regression model. To identify the presence of correlation among independent variables, one can examine the values of VIF (Variance Inflation Factor) and Tolerance. If the VIF value is less than 10 and the Tolerance value is greater than 0.10, then there is no multicollinearity in the regression model.

Table 7. Results of Multicollinearity Test

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	4.613300	3.576851	NA
EKS	0.073014	8.614597	6.242700
IMP	0.039977	7.179159	5.968518
JUB	0.014652	4.029514	1.172046

Source: Data processed using Eviews 10

The results from the multicollinearity test in the table above show that the Variance Inflation Factor (VIF) for the Export variable (X1) is 6.242700, for Import (X2) it is 5.968518, and for Money Supply (X3) it is 1.172046. These values are less than 10 and greater than 0.10. This indicates that there is no multicollinearity present within the regression model. In other words, the independent variables in this model do not exhibit significant correlation with each other.

Heteroskedasticity Test

The purpose of the heteroskedasticity test is to verify the presence of unequal variances among residuals in the regression model. Heteroskedasticity indicates a condition where residual variances differ (Harsono et al., 2023). The

heteroskedasticity test in this study uses the Breusch-Pagan-Godfrey method by examining the probability value of Chi-Square.

Table 8. Heteroskedasticity Test Results

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.464111	Prob. F(4,26)	0.0701
Obs*R-squared	8.521474	Prob. Chi-Square(4)	0.0742
Scaled explained SS	3.592036	Prob. Chi-Square(4)	0.4640

Source: Data processed using Eviews 10

Based on the test results above, it can be observed that the Chi-Square probability value is 0.0742, which is greater than 0.05 (0.0742 > 0.05). This indicates that there is no heteroskedasticity in the regression model.

5. Discussion

Influence of Exports on Inflation in Indonesia

In the long term, export growth has a significant positive effect on inflation rates in Indonesia from 1991 to 2022. This is evidenced by the probability value for long-term exports being lower than $\alpha = 5\%$ (0.0357 < 0.05). However, in the short term, while export growth has a positive impact, it is not significant in affecting inflation in Indonesia. This is indicated by the probability value for short-term exports being higher than $\alpha = 5\%$ (0.0687 > 0.05). Consequently, changes in export growth in the long term can affect inflation rates in Indonesia, but not in the short term.

These findings are consistent with studies by Maulana et al. (2020), Elva Dona et al. (2022), and Jumhur et al. (2018), employing multiple linear regression analysis, showing that exports have a significant positive impact on inflation in Indonesia. Exports can influence the available products for domestic consumers, thus affecting market prices domestically.

On the other hand, research by Sari and Rauf (2018) demonstrates a significant relationship between inflation rates and both exports and imports. Among these influences, imports are more affected by inflation.

Influence of Imports on Inflation in Indonesia

In the long and short term, import growth has a negative and significant impact on inflation in Indonesia from 1991 to 2022. This is demonstrated by the probability value for long-term imports being lower than $\alpha = 5\%$ (0.0243 < 0.05). Similarly, in the short term, import growth also has a negative and significant effect on inflation in Indonesia. This is shown by the probability value for short-term imports being less

than α = 5% (0.0430 < 0.05). Therefore, changes in import growth, both in the long and short term, can affect inflation rates in Indonesia.

These results align with Sari and Hasmarini's (2023) research, indicating that both Migas and Non-Migas imports have a negative and significant impact on inflation in Indonesia, as increased imports may lead to currency depreciation. Moreover, studies by Yeboah et al. (2015), Purwanti et al. (2014), and Elva Dona et al. (2022) indicate that imports can significantly and negatively influence inflation.

Influence of Money Supply on Inflation in Indonesia

In the long term, the money supply (JUB) has a positive and significant impact on inflation rates in Indonesia from 1991 to 2022. This is demonstrated by the probability value for JUB in the long term being smaller than α = 5% (0.0000 < 0.05). Similarly, in the short term, the money supply also has a positive and significant effect on inflation in Indonesia. This is indicated by the probability value for JUB in the short term being less than α = 5% (0.0000 < 0.05). Therefore, changes in the money supply, both in the long and short term, can affect inflation rates in Indonesia.

These research findings are in line with studies by Prasasti & Slamet (2020) and Jumhur et al. (2018), showing a significant impact of the money supply on inflation and interest rates. Additionally, research by Yahya & Pamuncak (2023) using ARDL found that the money supply has a positive and significant effect on inflation rates in two countries, Malaysia and Indonesia.

The results also support the Quantity Theory of Money, focusing on inflation concerning the money supply, where inflation can only occur if there is an increase in the money supply. The Quantity Theory of Money connects the money supply with price levels. This theory explains that when there is an increased money supply in an economy, prices rise, as it becomes more challenging to purchase goods in the market. Inflation occurs when prices rise faster than the available quantity of goods. This theory, initially proposed by Irving Fisher and later developed by Milton Friedman, has been used by several countries to analyze inflation-related issues (Awang 2016). Therefore, it can be concluded that there is a positive correlation between the money supply and inflation rates based on the Quantity Theory of Money and the research conducted.

6. Conclusion

Based on the research regarding the influence of exports, imports, and the money supply on inflation in Indonesia from 1991 to 2022 using the Error Correction Model

(ECM), it can be concluded that exports have a significant and positive effect on inflation in the long term but not in the short term.

On the other hand, imports and the money supply are capable of affecting inflation rates in Indonesia, both in the long and short term. Imports exhibit a negative influence on inflation, while the money supply demonstrates a positive impact.

Simultaneously, exports, imports, and the money supply collectively affect inflation rates in Indonesia during the period of 1991-2022. This indicates that in both the long and short term, increases and decreases in exports, imports, and the money supply collectively influence the fluctuations in inflation rates in Indonesia.

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