THE NEXUS BETWEEN INTERNATIONAL TRADE, EXCHANGE RATES, AND DOMESTIC PRICE LEVELS

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ABSTRACT

Inflation is a critical monetary phenomenon that significantly influences a country's economic conditions, including in Indonesia. This study aims to analyse the relationships between Exports, Imports, Exchange Rates, Interest Rates, and the Money Supply and the level of Inflation in Indonesia over one Decade. Data was obtained from Bank Indonesia, the Central Bureau of Statistics and the Ministry of Trade of the Republic of Indonesia. This study uses time series data from January 2015 to September 2024. Data analysis uses multiple linear regression using the Ordinary Least Squares (OLS) approach. The study's results indicate that the variables Export, Import, Interest Rate, and Money Supply have a significant effect on Inflation. Meanwhile, the Exchange Rate variable has no significant effect. However, through the F-test, it was found that simultaneously the variables of Export, Import, Exchange Rate, Interest Rate, and Money Supply have a significant effect on the Inflation rate in Indonesia.

Keywords: *Inflation, Exports, Imports, Exchange Rates, and Interest Rates*
JEL Classification: E43, 352, F10

I. INTRODUCTION

Inflation remains a central concern in macroeconomic policy formulation due to its impact on price stability and purchasing power. According to Bank Indonesia (2020), inflation is defined as a general and continuous increase in the prices of goods and services over time. An increase in the price of one or two goods alone cannot be called inflation unless it is widespread or leads to price increases in other goods. The opposite of inflation is called deflation. Inflation can reduce people's purchasing power, so it can be categorised as a monetary issue that greatly affects a country's economy. Not only that, but inflation is also an indicator of a country's economic health, indicating whether its economy is strong or weak. Indonesia, as one of many developing countries, has characteristics where inflation is still quite high and fluctuates rapidly (Volatile). In conditions where inflation rises and falls so quickly, it can cause the prosperity of some people to decline (Kevin & Abidin, 2023).

During the New Order era in 1998, Indonesia experienced a monetary crisis that caused inflation to soar to 77.6%, due to the rupiah's declining value. Previously, Indonesia experienced hyperinflation during the old order in 1966, which soared above 100% (y-o-y), reaching 635% at that time. It was caused by the large amount of money printed and circulated uncontrollably, as the government sought to fund debt at the time. Fluctuations in the inflation rate can be controlled; one policy is monetary policy (Mahendra, 2016). Inflation in Indonesia fluctuates every year. This is caused by the money supply, interest rates, and exchange rates. In addition, inflation can be caused by international trade activities, such as a country's exports and imports.
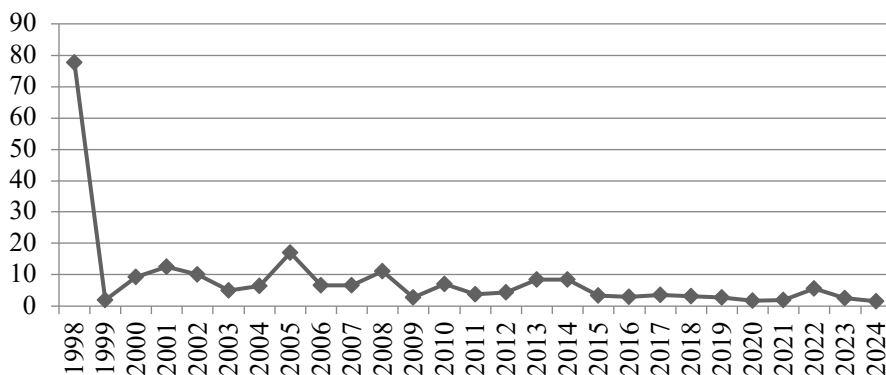

Figure 1. Indonesia's Inflation Rate in 1998 – 2024 (in per cent)
Source: Bank Indonesia

Figure 1 shows that inflation in Indonesia soared in 1998 at 77.6%, which is the highest value that occurred during 1998-2024, and declined dramatically in 1999. The result of high inflation is a decrease in the competitiveness of exported goods, as their prices rise, leading to reduced interest among domestic buyers. In exports and

imports, the exchange rate also affects export growth. A stronger exchange rate reduces a country's exports. This happens because domestic goods are more expensive than imported goods (Sari & Hasmarini, 2023). In 2005-2024, inflation fluctuated, meaning the price of goods increased, but the exchange rate remained stable. Rising prices of goods are caused by an increase in the amount of money circulating in society. If inflation in Indonesia increases, the prices of domestic goods will rise.
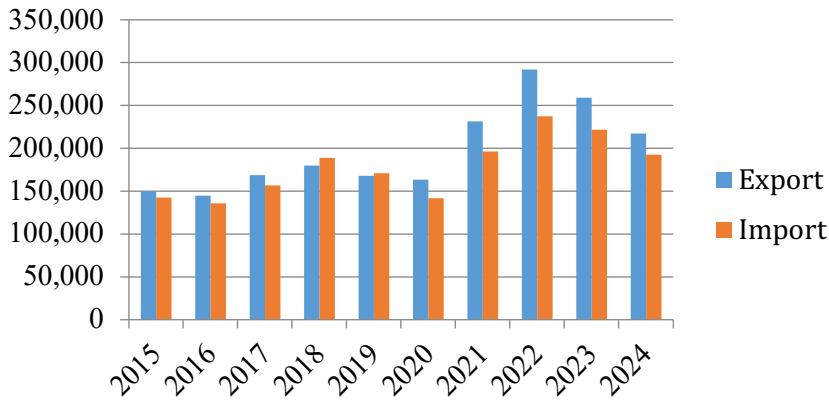

Figure 2. Indonesia's Export-Import Value in 2015 – 2024 (in million USD)
Source: Central Bureau of Statistics

Figure 2 shows that Indonesia's exports and imports are inversely proportional. It can be seen that the value of Indonesia's exports in 2015-2020 fluctuated quite significantly and in 2021-2024 experienced a significant spike. Then the value of imports is also similar, in 2015-2020 it fluctuates quite significantly, then in 2021-2024 it also experiences a significant spike, but unlike the export value, which is almost at 300 million US$. This also indicates that, from 2020 to 2021, there was a decline followed by a significant spike, suggesting a recovery in Indonesia's trade performance following the Covid-19 pandemic.
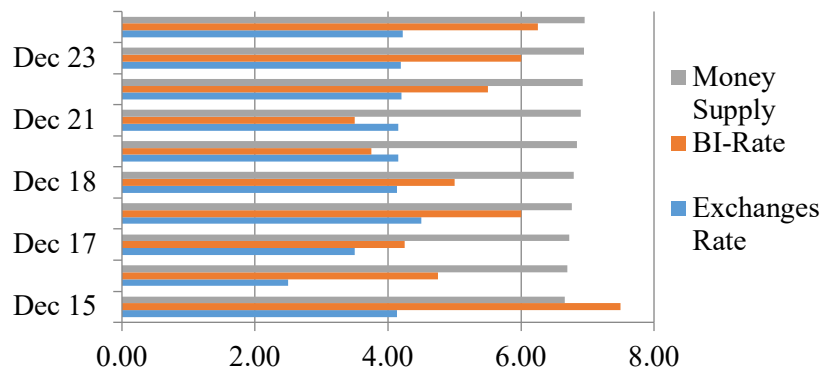

Figure 3. Indonesia's Exchange Rates, Interest Rates, and Money Supply
Source: Central Bureau of Statistics

Figure 3 shows Indonesia's Exchange Rates, BI rates, and Money Supply (JUB) from December 2015 to September 2024. The green graph shows Indonesia's JUB, indicating that its value from December 2015 to September 2024 is normal and has increased slightly year over year. However, it is inversely proportional to the exchange rate and the BI rate. In the red and blue graphs, it can be seen that the 2 variables fluctuate, which is quite significant every year, and BI-Rates reached its highest point in 2015 but subsequently experienced a very significant decline.

Using data presented in graphs on Indonesia's Exports and Imports, Exchange Rates, BI-rates, and Money Supply (JUB), research was conducted to examine the relationships among these 5 variables and the Inflation rate in Indonesia. The main objective of this research is to see the effect of international trade activities, namely Exports and Imports, on Inflation. In addition to examining the influence of international trade variables, this study examined the influence of macroeconomic and monetary variables on Indonesia's inflation rate.

Similar research was also conducted by Kevin & Abidin (2023) to examine the factors that influence the inflation rate over 1 decade, including macroeconomic monetary variables and international trade activity, as in previous research. Simon (2023) also conducted research on the factors influencing inflation in Indonesia during the pandemic. Other research was also conducted by Firmansyah & Safrizal (2018), who also examined the influence of macroeconomic monetary variables and export activity on the inflation rate.

The research gap between this research and previous research lies in the selection and use of data, as well as the amount of data, which distinguishes this research from previous research. The data selected and used in this study are time series data for 1 decade by selecting monthly data each year from January 2015 to September 2024, with a total of 117 data points per variable to be used, and a total of 702 data points to be used in this study using multiple linear regression analysis methods with the Ordinary Least Squares (OLS) approach. In addition, this study contributes to understanding the extent to which international trade activity variables and macroeconomic monetary variables influence the inflation rate in Indonesia. Given that there is no comprehensive agreement or conclusion regarding the influence of export-import variables and macroeconomic monetary variables, further research on this matter remains worthwhile.

II. LITERATURE REVIEW

Sakarya et al., (2025) stated in their research that unclear labour contracts between employees and companies can lead to inflation, thereby compromising the labour market's flexibility and creating supply-and-demand imbalances. According to Bank Indonesia (2020), inflation, a broad and ongoing rise in the prices of goods and services, has become evident over time. An increase in the price of just one or two goods cannot be called inflation unless the increase is widespread or results in price

increases in other goods. Simon (2023) stated that the BI rate has a considerable impact on inflation over the January–December 2020 and January–December 2021 periods, whereas the exchange rate and money supply variables have little effect.

Exports are a source of foreign exchange; to export, a country must have goods or services that can compete in international trade (Ilmas et al., 2022). Exports are a component of aggregate expenditure (Kiganda et al., 2017). The more goods or services a country exports, the higher its aggregate expenditure and national income (Kevin & Abidin, 2023). Firmansyah & Safrizal (2018) concluded that exports have no bearing on inflation, and neither do SBI nor the money supply

Meanwhile, the act of purchasing and bringing products into the nation products or services from another country into the nation is known as Import ;(Wulandari & Lubis, 2019: Stievany & Jalunggono, 2022). Imports are also defined as leaks that become an expenditure (Farina & Husaini, 2017). According to data from the Central Bureau of Statistics (BPS), Indonesia continues to see an increase in import volume each year. Salsabila (2024) indicates that Indonesia's inflation from 2017 to 2022 was significantly impacted by import values.

Exchange rates can be divided into two, namely nominal exchange rates and real exchange rates (Ningsih & Kristiyanti, 2018). The real exchange rate is persistent and volatile, while the nominal exchange rate fluctuates randomly and is not closely tied to macroeconomic fundamentals (Kano, 2024). The exchange rate is a comparison of currencies (Mahendra, 2016: Abdurehman & Hacilar, 2016). Monetary and macroeconomic variables, both domestic and global, affect exchange rates (Malec et al., 2024). Exchange rates are also influenced by the factor of reacting prices, because reacting prices are very important for monetary authorities to achieve price stability (Anderl & Caporale, 2023). Mahendra (2016) states that the money supply, SBI interest rates, and exchange rates during the period 2005 to 2014 have no significant simultaneous effect on inflation in Indonesia at the 5% significance level.

Furthermore, BI-Rate, also known as interest rate, is a benchmark of a country's economic activity that can affect banking financial flows, inflation, and investment, as well as the movement of the country's currency (Ningsih & Kristiyanti, 2018). Interest rates are the price paid when an exchange occurs (Yanti & Soebagyo, 2022). According to Beureukat (2022), Interest rates are a fundamental driver of inflation, as stated in the financial literature. In banking, interest rates can affect the wheels of banking (Beureukat, 2022; Chen & Valcarcel, 2025). Beureukat (2022) found that interest rates positively impact inflation; thus, if interest rates rise, inflation will follow suit.

Lastly, based on Kevin & Abidin's (2023) research, Money Supply (MS) is the total amount of money circulating in society. In accordance with its definition, JUB consists of MI, which includes cash and demand deposits; JUB, in a broad sense, namely M2, includes cash, demand deposits, and master money (Sonia & Setiawina, 2016). Keynes argued that the amount of money has little effect on prices because they are determined solely by purchasing power or aggregate demand (Sabade,

2014). Keynesians emphasise aggregate spending; monetarists emphasise money supply growth (Malec et al., 2024). According to Nguyen (2015), as governments raise expenditure to spur economic growth and job creation, the majority of Asian nations chosen have comparatively high fiscal deficits and money supply. Panjaitan et al. (2021) stated that the money supply is not significant for the development of inflation in North Sumatra, as the money supply in this study includes only currency and demand deposits (M1) in the community. While in general, the money supply includes foreign currency and bank deposits used by households to interact. In this case, the money supply has no short-term effect on inflation in North Sumatra.

III. METHODOLOGY

This study employs secondary data and adopts a quantitative approach. The data used are time-series monthly data from January 2015 to September 2024, sourced from the official websites of the Central Bureau of Statistics (BPS), Bank Indonesia (BI), and the Indonesian Ministry of Trade (Kemendag). This study employs one dependent variable and five independent variables, symbolised by Y the dependent variable and X the independent variable. In this study, Inflation is Y/dependent variable and Export(X_1), Import(X_2), Exchange Rate(X_3), BI-Rate(X_4), and Money Supply (JUB) (X_5). The following is the formulation of the model utilised in this study:

Where INF is a representation for the dependent variable *(Y)* Inflation (in per cent), then β_0 is a constant, $\beta_1, \beta_{2,}\beta_3, \beta_4, \beta_5$ for the slope or regression coefficient of the independent variable *(X)*, log the natural logarithm operator. Then, EKS for Export Value (in million USD), IMP for Import Value (in million USD), EXR for Exchange Rate (in million USD), BIR for BI-Rate (in per cent), and JUB **f**or Money Supply (M2) (in billion rupiah). The last one is ε which represents the error term.

IV. RESULTS AND ANALYSIS

In the initial phase, the summary is examined. The summary is examined in order to ascertain the standard deviation, observation value, and mean of each observed variable. After reviewing the summary, the next step is to perform a correlation analysis to determine whether each variable is correlated with the others.

Table 1. Summary and Correlation Test

		EKS	IMP	EXR	BIR	JUB	INF
Mean		9.6880	9.6411	9.5670	5.1589	15.6444	3.4192
Std. Deviation		0.25820	0.20156	0.05946	1.22217	0.23630	1.47240
Observation		117	1117	117	117	117	117
INF	Pearson Correlation	-0.150	-0.260	-0.298	0.617	-0.426	-
	Sig. (2-tailed)	0.106	0.005	0.001	0.000	0.000	-

Table 1 presents the Descriptive Statistical Analysis and Correlation Test to determine the average for each variable and summarises the correlation test results. The correlation test used to determine the relationship between variable X and variable Y. And shown in Table 1 that the X variables that have a relationship with variable Y are the IMP, EXR, BIR, and JUB variables which have a correlation/relationship with the INF variable with a significance value < 0.05, while the EKS variable has no correlation/relationship with the INF variable because the significance value of the variable is > 0.05. However, the IMP, EXR, and JUB variables show a negative correlation with the INF variable, meaning that if the X variable increases, the Y variable decreases, and vice versa. Meanwhile, the BIR variable shows a positive correlation with the INF variable, meaning that whenever the BIR variable increases, the INF variable increases, and when the BIR variable decreases, the INF variable decreases. Subsequently, multiple regression analysis is conducted.

Table 2. ANOVA

Model		Sum of Squares	df	Mean Squares	F	Sig.
		ANOVAa				
1	Regression	181.038	5	36.208	57.053	.000b
	Residual	70.444	111	0.635		
	Total	251.458	116			

a. Dependent Variables: INF

b. Predictors: (Constant) JUB, BIR, EXR, IMP, EKS

Before analysing the F-Test, Determinant Coefficient (R^2) is examined, and the result shows the Adjusted R Square value is .707, meaning that the variables X1, X2, X3, X4, and X5 can explain variations in variable Y by 70.7%, while the remaining 29.3% is explained by new variables not included in the previous model. The subsequent test indicates that the F-count is 57.03, as shown in Table 2. If the F-count value > F-table and the F-count value is known to be 57.053 and F-table 2.30, then it can be claimed that variables X1, X2, X3, X4, and X5 all have an impact on variable Y at the same time. Therefore, with a significance value < 0.05 or 0.000, it may be said that variables X1, X2, X3, X4, and X5 all have an impact on variable Y at the same time.

Table 3. Regression Result

Coefficients						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	74.622	16.358		4.562	0.000
	EKS	11.846	1.269	2.077	9.338	0.000
	IMP	-9.001	1.445	-1.232	-6.228	0.000
	EXR	0.124	2.692	0.005	0.046	0.963
	BIR	0.512	0.078	0.425	6.558	0.000
	JUB	-6.586	1.002	-1.057	-6.574	0.000

The regression test findings between variables X1, X2, X3, X4, and X5 on variable Y are displayed in Table 5. Four X variables are known to significantly affect variable Y, but one X variable has no influence, according to a comparison of t-statistics and t-tables. EKS, IMP, BIR, and JUB are the X factors that significantly affect the Y variable, while EXR is the only variable that does not have a discernible effect on the Y variable.

With a known t-table value of 1.981, the t-statistic values for each variable are as follows: EKS is 9.338, IMP is -6.228, EXR is 0.046, BIR is 6.558, and JUB is -6.574. With a t-statistic value > t-table and a significance value < 0.05, it is therefore determined that the EKS and BIR variables significantly positively affect the Y variable. With a -t-statistic value > -t-table and a significance value < 0.05, the IMP and JUB variables, on the other hand, significantly negatively affect the Y variable. Since the significance value is greater than 0.05 and the t-statistic value of EXR is less than the t-table, the other variable, EXR, does not significantly affect variable Y. In the event that variable X significantly improves variable Y, then variable Y will likewise rise as variable X does. Conversely, variable Y will likewise decrease if variable X does. Conversely, if variable X negatively affects variable Y, then variable Y will decrease as variable X increases. In the other case, variable Y will rise if variable X falls.

In accordance with the main purpose of this research, which is to determine how international trade activities, such as imports and exports, affect the rate of inflation. This study aims to determine the impact of macroeconomic monetary variables on Indonesia's inflation rate, as well as the impact of foreign trade activities. This study is urgent because there is no consensus or thorough conclusion on the factors influencing Indonesia's inflation rate. Therefore, it is being carried out to determine the causes influencing Indonesia's inflation rate. This study's primary contribution is determining the extent to which the macroeconomic monetary factor and the international trade activity factor impact. The findings of this research, as determined by the T-test, indicate that the factors of money supply, interest rate, imports, and exports significantly impact inflation. In the meantime, there is no

discernible impact from the exchange rate variable. The F-test, however, revealed that the factors of export, import, exchange rate, interest rate, and money supply all significantly affect Indonesia's inflation rate simultaneously.

V. CONCLUSION AND RECOMMENDATION

Based on the results and discussion of the effect of Exports, Imports, Exchange Rates, Interest Rates, and Money Supply on the Inflation rate in Indonesia for one decade from January 2015 to September 2024, it can be concluded that through the F-test simultaneously concluded that Exports, Imports, Exchange Rates, Interest Rates, and Money Supply have a significant effect on the Inflation rate in Indonesia for one decade from January 2015 to September 2024. However, through partial T-Tests, it is concluded that Exports and Interest Rates have a significant positive effect on the Inflation rate, then Imports and Money Supply have a significant negative effect on the Inflation rate. Meanwhile, the Exchange Rate has no significant effect on the Inflation rate in Indonesia over the past decade, from January 2015 to September 2024. These findings highlight the importance of maintaining exchange rate stability within the broader inflation control framework.

Lastly, based on the research conducted, several limitations were encountered during the process and may be considered by future researchers in refining the research, as this research continues to have shortcomings that need to be improved in future research. The limitations of this study include incomplete data from each available reference, resulting in insufficient data to present.

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