# Determinant Analysis of International Trade and Amount of Money in Circulation Against Benchmark Rates

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| Article Info | ABSTRACT |
|---|---|
| | The objective of this study is to investigate the impact of independent variables (currency, exports, imports, savings, and credit) on the dependent variable (BI Rate) using the Ordinary Least Squares (OLS) method. The data utilized in this research are sourced from Bank Indonesia, the Central Statistics Agency (Biro Pusat Statistik), and the World Bank, spanning the years 2010 to 2022. The focus of this research is on the macroeconomic conditions in Indonesia.The findings reveal that among the five independent variables, only the exchange rate (Kurs) exerts a partial influence on the BI Rate as the dependent variable. Moreover, collectively, the independent variables, comprising imports, exports, exchange rates, loans credit, and public savings, demonstrate a significant influence on the BI Rate as the dependent variable.<br><br> |

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## INTRODUCTION

The BI-Rate serves as one of the tools utilized by Bank Indonesia to regulate and shape the trajectory of the economy. Through the BI-Rate, Bank Indonesia can manage the circulation of money and achieve specific objectives. In formulating their policies, Bank Indonesia considers various factors, including the state of international trade, currency dynamics, and geopolitical conditions.

Presently, international trade plays a pivotal role in determining a country's economic landscape. Leveraging international trade effectively can facilitate technology transfer, create job opportunities, and foster gradual economic development.

In an era marked by challenges and uncertainties, Bank Indonesia's policies, particularly through the BI 7 days Repo Rate (BI7DRR), are increasingly crucial for sustaining a nation's economic growth. Additionally, interest rates play a significant role in curbing inflationary pressures, particularly stemming from increased demand for money in the stock and real markets.

Currency dynamics also factor into the determination of policies. Through interest rates, Bank Indonesia can influence a nation's currency exchange rates. Exchange rates determine the purchasing power of one currency relative to another and are influenced by various factors, including policy measures, export-import balances, and the money supply in other nations.

On the other hand, the availability of loan credit and public savings in regulating money circulation also impacts the formulation of BI-Rate policies. Loan and savings dynamics are variables that affect the money

supply. Lower interest rates may prompt increased borrowing, leading to an expansion of the money supply, while higher rates may discourage borrowing, resulting in a contraction of the money supply.

**METHOD**

This study utilizes secondary quantitative data, comprising 5 independent variables and 1 dependent variable. The independent variables include Imports, Exports, Exchange Rates, Credit Granted, and Community Savings, while the dependent variable is the BI-Rate. The data covers the period from 2010 to 2022, amounting to a total of 78 observations sourced from both the Bank Indonesia website (Bank Indonesia, 2023) and The World Bank Data website (The World Bank, n.d.).

A quantitative approach is employed in this research, specifically utilizing the Multiple Linear Regression Method to examine the relationship between the dependent variable (BI-Rate) and the independent variables (Imports, Exports, Exchange Rates, Credit Granted, and Community Savings). The analysis is conducted using E-Views 12 software.

The Multiple Linear Regression Model is described with the following equation:

$$\text{BI-Rate} = \alpha + \beta_1\text{Import} + \beta_2\text{Export} + \beta_3\text{KURS} + \beta_4\text{Loans} + \beta_5\text{Savings} + e \quad (1)$$

Notes :
$\alpha$ = constant
$\beta_1$ = Import Coefficient Value
$\beta_2$ = Export Coefficient Value
$\beta_3$ = Kurs/Exchange rate Coefficient Value
$\beta_4$ = Loans Credit Coefficient Value
$\beta_5$ = Public Savings Coefficient Value
$Y$ = BI-Rate(Dependent variable)
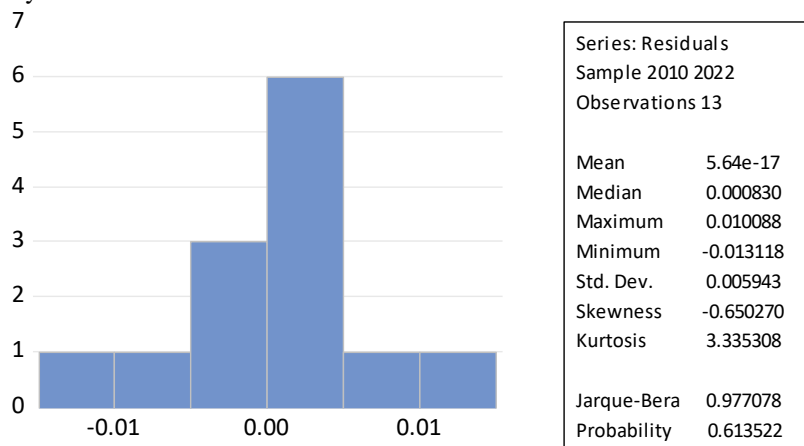$e$ = Error (Confounding Variable)

**RESEARCH RESULTS**

Research Hypothesis
1. Ho = There is no influence of the Import variable on the BI-Rate variable.
   Ha = There is an influence of the Import variable on the BI-Rate variable.
2. Ho = There is no influence of the Export variable on the BI-Rate variable.
   Ha = There is an influence of the Export variable on the BI-Rate variable.
3. Ho = There is no influence of the Kurs variable on the BI-Rate variable.
   Ha = There is an influence of the Kurs variable on the BI-Rate variable.
4. Ho = There is no influence of the Loans Credit variable on the BI-Rate variable.
   Ha = There is an influence of the Loans Credit variable on the BI-Rate variable.
5. Ho = There is an influence of the Public Savings variable on the BI-Rate variable.
   Ha = There is an influence of the Public Savings variable on the BI-Rate variable.
6. Ho = There is no influence of the Import, Export, Kurs, Loans Credit and Public Savings variable on the BI-Rate variable.
   Ha = There is an influence of the Import, Export, Kurs, Loans Credit and Public Savings variable on the BI-Rate variable.

Classic Assumption Test

a. Normality test



| | |
|---|---|
| Series: Residuals | |
| Sample 2010 2022 | |
| Observations 13 | |
| Mean | 5.64e-17 |
| Median | 0.000830 |
| Maximum | 0.010088 |
| Minimum | -0.013118 |
| Std. Dev. | 0.005943 |
| Skewness | -0.650270 |
| Kurtosis | 3.335308 |
| Jarque-Bera | 0.977078 |
| Probability | 0.613522 |

If the Jarque-Berra Probability Value > Significance level (α) 5% or 0.05 then the data is normally distributed.Based on the graph above, it can be seen that the Jarque-Bera Probability value is 0.613522. This means 0.613522> 0.05. Based on the Jarque-Bera Value, it is concluded that the data is normally distributed and does not experience normality problems.

b. Autocorrelation test

**Table 1. Autocorrelation test**

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

| | | | |
|---|---|---|---|
| F-statistic | 2.126476 | Prob. F(2,5) | 0.2146 |
| Obs*R-squared | 5.975215 | Prob. Chi-Square(2) | 0.0504 |

If the value of Prob. Chi-Square > Significance level (α) 5% or 0.05 then the data is free from autocorrelation problems.  Based on the autocorrelation output, the Prob. value is obtained Chi-Square is 0.0504.This means 0.0504 > 0.0500 and a decision is made that the data is free from Auto Correlation problems.

c. Heterokedasticity test

**Table 2. Heterokedasticity test**

Heteroskedasticity Test: Glejser
Null hypothesis: Homoskedasticity

| | | | |
|---|---|---|---|
| F-statistic | 0.395443 | Prob. F(5,7) | 0.8378 |
| Obs*R-squared | 2.863227 | Prob. Chi-Square(5) | 0.7211 |
| Scaled explained SS | 1.920366 | Prob. Chi-Square(5) | 0.8601 |

If the value of Prob. Chi-Square Obs*R-Square > Significance level (α) 5% or 0.05, then the data is free from heteroscedasticity problems.Based on the Heteroscedasticity Test Output, the Prob. Value is obtained Chi-Square is 0.7211. This means 0.7211 > 0.0500 and a decision is taken that the data is free from heteroskedasticity problems.

d. Multicolliniearity test

**Table 3. Multicolliniearity test**

| | BI_RATE | IMPOR | EKSPOR | KURS | KREDIT | SIMPANAN |
|---|---|---|---|---|---|---|
| BI_RATE | 1.000000 | -0.074561 | -0.348979 | -0.347848 | -0.547431 | -0.604490 |
| IMPOR | -0.074561 | 1.000000 | 0.904151 | 0.664682 | 0.694274 | 0.676038 |
| EKSPOR | -0.348979 | 0.904151 | 1.000000 | 0.771737 | 0.850560 | 0.891323 |
| KURS | -0.347848 | 0.664682 | 0.771737 | 1.000000 | 0.950280 | 0.890737 |
| KREDIT | -0.547431 | 0.694274 | 0.850560 | 0.950280 | 1.000000 | 0.969480 |
| SIMPANAN | -0.604490 | 0.676038 | 0.891323 | 0.890737 | 0.969480 | 1.000000 |

If the numbers outside the Diagonal Line have a value < 1, then multicollinearity does not occur. Based on the output value of the multicollinearity test, all numbers outside the diagonal line have a value < 1, so, multicollinearity does not occur.

e. Partial Hypothesis test (T- test)

**Table 4. T- test**

Dependent Variable: BI_RATE
Method: Least Squares
Date: 11/28/23   Time: 23:50
Sample: 2010 2022
Included observations: 13

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | -0.066463 | 0.037361 | -1.778955 | 0.1185 |
| IMPOR | -1.95E-08 | 4.91E-08 | -0.396849 | 0.7033 |
| EKSPOR | 7.09E-08 | 6.04E-08 | 1.172934 | 0.2792 |
| KURS | 1.12E-05 | 3.69E-06 | 3.034966 | 0.0190 |
| KREDIT | -1.27E-08 | 1.18E-08 | -1.075869 | 0.3177 |
| SIMPANAN | -1.61E-08 | 1.22E-08 | -1.323905 | 0.2271 |

| | | | | |
|---|---|---|---|---|
| R-squared | 0.820980 | Mean dependent var | | 0.056731 |
| Adjusted R-squared | 0.693108 | S.D. dependent var | | 0.014045 |
| S.E. of regression | 0.007781 | Akaike info criterion | | -6.570255 |
| Sum squared resid | 0.000424 | Schwarz criterion | | -6.309509 |
| Log likelihood | 48.70666 | Hannan-Quinn criter. | | -6.623850 |
| F-statistic | 6.420352 | Durbin-Watson stat | | 1.509040 |
| Prob(F-statistic) | 0.015052 | | | |

Based on the data output above, the following results and conclusions can be drawn:
(a) Impor t-calculated value   =-0.397 < 2.365 (n-k-1 = 13 – 5 - 1 = 7; α 5%) then the value of Prob. 0.703 > 0.05, so Ha is rejected and Ho is accepted
(b) Eksport-calculated value= 1.173 < 2.365 (n-k-1 = 13 – 5 - 1 = 7; α 5%) then the value of Prob. 0.279 > 0.05, so Ha is rejected and Ho is accepted
(c) Kurst-calculated value =3.035 > 2.365 (n-k-1 = 13 – 5 - 1 = 7; α 5%) then the value of Prob. 0.0190 > 0.05, so Ha is accepted and Ho is rejected
(d) Kredit t-calculated value = -1.076 < 2.365 (n-k-1 = 13 – 5 - 1 = 7; α 5%) then the Prob value. 0.3177 > 0.05, so Ha is rejected and Ho is accepted
(e) Simpanant-calculated value =-1.324 < 2.365 (n-k-1 = 13 – 5 - 1 = 7; α 5%) then the value of Prob. 0.2271 > 0.05, so Ha is rejected and Ho is accepted

Conclusions:
(a) Hypothesis 1 → Ho =   There is no influence of the Import variable on the BI-Rate variable
(b) Hypothesis 2 → Ho =   There is no influence of the Export variable on the BI-Rate variable
(c) Hypothesis 3 → Ha =   There is an influence of the Kurs variable on the BI-Rate variable
(d) Hypothesis 4 → Ho =   There is no influence of the Loans Credit variable on the BI-Rate variable
(e) Hypothesis 5 → Ho =   There is no influence of the Public Savings variable on the BI-Rate variable

f. Data Interpretation
Y =–0,0665 – 1,9501Impor+ 7,0862Ekspor+ 1,1205Kurs –1,2694Kredit–1,6149Simpanan (2)

1) The value of the constant coefficient (α) is negative 0.0665, meaning that if Imports (X1), Exports (X2), Exchange Rates (X3), Loans Credit (X4) and Public Savings (X5) are 0 (zero), then the average Bank Indonesia Interest Rate (BI-Rate) = 0.0665%
(note: the average size of the BI-Rate remains because it comes from the influence of variables that also influence the BI-Rate, but are not included in the regression model).
2) The Import Coefficient value of -1.9501 indicates that if there is an increase in imports of 1%, the BI-Rate will decrease by 1.9501%
3) The Export Coefficient value of 7.0862 indicates that if there is an increase in exports of 1%, the BI-Rate will increase by 7.0862%

4)  The exchange rate coefficient value of 1.1205 indicates that if there is an increase in the exchange rate of 1%, the BI-Rate level will increase by 1.1205%
5)  The Loans Credit Coefficient Value of -1.2694 indicates that if there is an increase in Loans Credit by 1%, the BI-Rate will decrease by 1.2694%
6)  The Public Savings Coefficient value of-1,6149 indicates that if there is an increase in the public savings of 1%, the BI-Rate will decrease by 1,6149%

In the Regression Output Table, the R-Square value is 0.820980, indicating that the variables Import, Export, Exchange Rate, Loans Credit and Public Savings have an effect on the BI-Rate by 82.098%. The remaining 17.902% is influenced by other variables not examined in this research.

**CONCLUSION**

Based on the research results above, several conclusions can be drawn as follows:
1. Among the five independent variables, only the Kurs (Exchange Rate) partially influences the BI-Rate as the dependent variable.
2. Simultaneously, the independent variables consisting of Import, Export, Exchange Rate, Loans Credit and Public Savings influence the BI-Rate as the dependent variable.

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