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Analysis of Money Supply and Inflation as Well as Trade Balance on Exchange Rates in Indonesia Using BI Rate as A Moderating Variable

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KEYWORDS
Money Supply, Inflation, Trade Balance, BI Rate and Inflation.

ABSTRACT
The purpose of this study is to find out the Analysis of the Money Supply and Inflation and Trade Balance to the Exchange Rate in Indonesia Using the BI Rate as a Moderating Variable. This study uses data from the time sequence of 2005-2023 using secondary data, using Multiple Linear Regression and Moderating Variable analysis tools with the help of SPSS 23.0 software, to use BI Rate as a Moderating Variable to provide a strengthening or weakening relationship between Inflation to Exchange Rate and to determine the relationship between variables such as Money Supply, Inflation, Trade Balance and BI Rate to Exchange Rate. Based on the results of this study, it shows that the Money Supply has a positive and significant effect on the Exchange Rate in Indonesia, Inflation also has a negative and insignificant effect on the Exchange Rate in Indonesia, the Trade Balance has a negative and significant effect on the Exchange Rate in Indonesia, but the BI Rate is not a moderating variable because it cannot strengthen the relationship between Inflation and the Exchange Rate in Indonesia.

INTRODUCTION

The occurrence of this global financial crisis has changed the Indonesian economic order, which initially began in the United States in 2007 and then impacted countries around the world, including developing countries in 2008 (BI Report, 2008). As a result of this crisis, Indonesia's economic performance also declined, influencing instability that affected the economic sphere, such as inflation, the circulation of money, rising interest rates, national income, and the position of international and non-economic balance of payment transactions, such as politics, security, socio-culture, and national resilience (Atmadja, 2002). The consequences of this crisis in Indonesia itself began at the end of 2008 with a drastic decline in the exchange rate and the value of the rupiah due to depreciation and plummeting exports (BI Report, 2008). The uncertainty of economic conditions in Indonesia, influenced by the financial crisis from the United States, made it possible for large capital outflows in the capital market sector in Indonesia.

In principle, the government has made various efforts through its policies to maintain Indonesia's macroeconomic stability, its financial system, and its resilience, which also includes control mechanisms in monetary and fiscal policies. A regulation formed to achieve its target by regulating the amount of money circulation is called monetary policy, while those related to taxation and government spending are called fiscal policy (Nopirin, 1987:34-35). Thus, monetary

policy focuses on rules and control over the circulation of money, and fiscal policy focuses on regulating government income and expenditures.

For the life of the human economy, almost everything relates to the existence of money itself, which, if the circulation of money loses control, will cause unfavorable consequences in the macroeconomy, as seen from the lack of control over several main economic variables that develop, namely prices and levels of production or output. This is the background for the government or its monetary authority in making efforts to control the circulation of money in the economy (Warjiyo, 2003).

In the economic cycle, money plays a crucial role whose main functions are to be used as a medium of exchange, to store value, and to become a unit of calculation. One theoretical or empirical study of its influence on real decisions and dynamic balance in the economy, used by a development approach based on assumptions to analyze its balance in general in the economic system, has important consequences. One such consequence is to provide an evaluation of the difference in perception of monetary economic theory, which considers certain assumptions based on the development of an economic model or the method of introducing the role of money in an economic model (Warjiyo, 2016).

Money itself provides convenience to become a medium of exchange on the condition that its management runs well, which is neither too much nor too little in order to maintain the smooth running of the economy. If there is instability in the sense of excess or scarcity, economic problems such as deflation or inflation will arise (Amaliawati & Murni, 2014). To analyze economic conditions, one of the indicators can be seen through inflation because this has a high impact on the economy, affecting changes in interest rates, rising prices, distorted taxes, changes in the labor market, and the redistribution of wealth that occurs between creditors and debtors, among others (Mankiw, 2012).

In general, economists agree that inflation has an effect on distribution and labor costs, which negatively affects growth, especially during periods of rapid economic development. With the high employment opportunities that arise, the level of income increases, and there is a cost that exceeds the ability to provide its production results (Sukirno, 2013). Inflation also impacts the level of prosperity in society, as inflation occurs while people's income decreases. This inflation also influences the method of distributing income, people's assets, and debts, with nominal interest rates that do not change.

Rising prices will cause inflation, which creates uncertainty in the production system because the cost of raw materials for production increases, making economic activities expensive with changes in output levels. Inflation is also volatile, which means there is no certainty for the welfare of the people, and their interest in buying goods/services decreases (Mankiw, 2006). Not only inflation, but economic growth is also affected by the policies and regulations issued by the government to provide economic stability. To increase this growing economy, there are factors that trigger it. The first is the existence of global factors, and one of the other factors that provide obstacles is the state of the global economy.

The state of a country's economy is able to make measurements in assessing the progress and development of market economic activities in the country if the country already has extensive

market connections. Although the role of money is essential in the smooth running of an economy, using money in trade will cause stagnation in the flow of money if its amount is not well controlled.

An important external factor in supporting Indonesia's economic process is the state of its trade and the global economy. If its partner is weak, it will affect the progress of the Indonesian economy. Another factor is bilateral relations with cooperation in the trade sector.

To achieve its benefits, each country compares itself with other countries, which is one of the main purposes of international trade. This is called the absolute advantage of one country over another. Countries that export/import will profit from international trade, gaining markets through exports and obtaining goods through imports, which in turn has a wide impact on the economy of a country (Ekananda, 2015).

With international trade, there is a need for an exchange rate, which is used as a comparison of the value of currencies between countries. In the case of the rupiah and US dollars, the exchange rate is defined in terms of 1 US dollar with the free-floating exchange rate system implemented in August 1998 (Atmadja, 2002).

An exchange rate system, where the determination is left entirely to the market without any government intervention and is constantly adjusted based on the supply and demand conditions of the currency, is called the free-floating exchange rate (Madura, 2006:222). With this fluctuating exchange rate, it appreciates when the value of the domestic currency increases more than that of the foreign currency. On the other hand, if the value decreases, it will depreciate. In 2007, there was stability in the rupiah exchange rate against the US dollar.

The stability of the rupiah value was obtained through the basic support of the improvement of the national macroeconomy, even when there was turmoil in the world economy. However, during the global financial crisis in 2008, the rupiah exchange rate depreciated, foreign exchange stocks decreased, and were limited, while the prices of export commodities also dropped. As a result, payment performance and exchange rates deteriorated (BI Report, 2008). The desired economic state is the appreciation and stability of the rupiah.

Another factor affecting the rupiah exchange rate is the BI Rate, which is a policy that describes the monetary policy determination of Bank Indonesia (BI). This decision is generally announced to the public by the BI Board of Governors during their monthly meetings and is implemented through BI's monetary operations in managing liquidity in the money market to achieve the operational targets of its monetary policy.

Although research has examined the effect of money supply moderation on the relationship between trade balance, exchange rate, and inflation, there is still a lack of research that integrates the BI Rate into this moderation relationship in the Indonesian context. It is important to consider that domestic demand that is not offset by increased economic capacity can put pressure on the balance of payments. Moreover, increased economic activity has driven an increase in imports, especially imports of raw materials and capital goods. Most studies have focused on direct impacts, but the effect of BI Rate moderation on other variables can reveal nuanced relationships. For example, the effectiveness of the BI Rate in managing inflation can be strengthened or weakened depending on the level of money supply in the economy and the state of the trade balance.

The Comprehensive Moderation Analysis examines the role of BI Rate moderation on the relationship between money supply, inflation, exchange rates, and trade balances, providing a more holistic understanding of the factors that affect the rupiah exchange rate. The Contextual Focus on Indonesia focuses specifically on Indonesia, a developing economy with monetary policy challenges and unique trade dynamics, providing certain added value. The Dual Monetary System Perspective explores the differences between the conventional and Islamic monetary systems in influencing Indonesia's macroeconomic performance and can also add novelty to this study. In essence, the novelty lies in the integration of these various aspects into a single study, which provides a more nuanced understanding of exchange rate dynamics in Indonesia.

Table 1. Development and Realization of Indonesia's Money Supply, Inflation, Trade Balance, Exchange Rate and BI Rate in 2019 – 2023

Year	Money Supply (Billion Rupiah)	Inflation (Percent)	Trade Balance (US$ Million)	Exchange Rate (Rupiah)	BI Rate (Percent)
2019	6,136,552.00	2,72	2,407.30	14,102.00	5,00
2020	6,900,049.49	1,68	21,623.00	14,105.00	3,75
2021	7,870,452.85	1,87	35,419.50	14,311.96	3,50
2022	8,528,022.31	5,51	54,461.30	15,731.00	5,50
2023	6,149,423.74	2,61	36,911.40	15,416.00	6,00

Source : Indonesian Central Statistics Agency, 2019-2023

By looking at some of the phenomena and explanations that have been stated above, the author is interested in taking the title in this thesis, namely: **Analysis of Money Supply and Inflation and Trade Balance to Exchange Rates in Indonesia Using BI Rate as a Moderating Variable.**

METHOD

This study is quantitative descriptive research with moderating analysis that aims to determine whether the BI Rate can strengthen the relationship between *Inflation* and *Exchange Rates* in Indonesia, using multiple regression analysis to assess the relationship between *Money Supply*, *Inflation*, *Trade Balance*, the *BI Rate*, and moderating variables between *Inflation* and the *BI Rate* on *Exchange Rates* in Indonesia. To process data collection, research was carried out with the following methods:

1. Secondary data, which is sourced from documents through agencies and others. In this data collection, data from the Central Statistics Agency (*BPS*) and Bank Indonesia were used.
2. Furthermore, data collection can be obtained through *library research*, which involves the collection and study of existing literature as a guideline or theoretical basis related to thesis writing. Data collection is carried out by recording official reports from books, magazines, and other print media.

In accordance with the problems and objectives that have been formulated, the analysis method in this study is the quantitative analysis method, which uses data in the form of numbers and applies a descriptive format. The aim is to explain and summarize events, conditions, or

variables that exist in the society that is the object of the research, based on real facts. These are then calculated to describe the situation and conditions of the variable.

Analysis of *Money Supply*, *Inflation*, *Trade Balance*, *BI Rate*, and *Inflation Moderation Variables* and the *BI Rate* on *Exchange Rates* can be done with a multiple regression model. According to Prastisto (2004:112), this model's purpose is to understand the impact of the independent variables on the dependent variables.

Multiple linear regression analysis is used to predict the value of the dependent variable when there is a change in the independent variable (Sugiyono, 2005:250). The model can be formulated as follows:

$$\mathbf{Y = a + b1X1 + b2X2 + b3X3 + b4Z + b_5(X2*Z) + e} \quad \text{..... 3.1}$$

The description:
Y = Exchange Rate in Indonesia.
a = A unit of a constant number.
b1 – b5 = Regression Coefficient For
X1 = The amount of money supply in Indonesia.
X2 = Inflation in Indonesia.
X3 = Trade Balance in Indonesia.
X4 = BI Rate in Indonesia.
X5 = Moderation (between BI Rate and Inflation) in Indonesia
E = Residual Value

RESULTS AND DISCUSSION

Hypothesis Testing

The data obtained from the results of the above research regarding the Analysis of JUB and Inflation and Trade Balance on Exchange Rates in Indonesia uses the BI Rate as a moderating variable. in Indonesia in the last 19 years in the period 2005 to 2023, an analysis of these secondary data will be carried out. The following data was obtained from the results of the study:

Table 2. Recapitulation of Data on Money Supply, Inflation, Trade Balance, Exchange Rate Inflation, and BI Rate Indonesia in 2005 to 2023

Year	Money Supply (x_1)	Inflation (X2)	Trade Balance (x_3)	Exchange Rate (Y)	BI Rate (Z)
2005	1,202,762.00	16.94%	27,959.00	9,830.00	12.75%
2006	1,382,493.00	6.04%	39,733.10	9,020.00	9.75%
2007	1,649,662.00	8.30%	39,627.50	9,419.00	8.00%
2008	1,895,839.00	13.06%	7,823.10	10,950.00	9.25%
2009	2,141,383.70	4.31%	19,680.80	9,400.00	6.50%
2010	2,471,205.79	7.28%	22,115.80	8,991.00	6.50%
2011	2,877,219.57	6.35%	26,060.90	9,068.00	6.00%
2012	3,304,644.62	5.60%	(1,670.70)	9,670.00	5.75%
2013	3,730,197.02	9.65%	(4,076.90)	12,189.00	7.50%
2014	4,173,326.50	7.66%	(2,198.80)	12,440.00	7.75%

2015	4,548,800.27	4.89%	7,671.80	13,795.00	7.50%
2016	5,004,976.79	3.39%	9,481.20	13,436.00	4.75%
2017	5,419,165.05	3.15%	11,842.70	13,548.00	4.25%
2018	5,760,046.20	3.24%	(8,698.60)	14,481.00	6.00%
2019	6,136,552.00	1.66%	2,407.30	14,102.00	5.00%
2020	6,900,049.49	0.78%	21,623.00	14,105.00	3.75%
2021	7,870,452.85	2.15%	35,419.50	14,311.96	3.50%
2022	8,528,022.31	5.35%	54,461.30	15,731.00	5.50%
2023	8,824,747.96	3.46%	36,911.40	15,416.00	6.00%

Source : Data processed from Table 5.1

Classic Assumption Test

Normality Test

This test serves to determine the distribution of residual normal and abnormal progress, which is carried out by the *Kolmogorov-Smirnov test.* The results of the analysis are shown through this table, namely:

Table 3. One-Sample *Kolmogorov-Smirnov* Test

One-Sample Kolmogorov-Smirnov Test

			Unstandardized Residual
N			19
Normal Parameters[a,b]	Mean		.0000000
	Std. Deviation		670.7206228
Most Extreme Differences	Absolute		.129
	Positive		.112
	Negative		-.129
Test Statistic			.129
Asymp. Sig. (2-tailed)[c]			.200[d]
Monte Carlo Sig. (2-tailed)[e]	Sig.		.543
	99% Confidence Interval	Lower Bound	.531
		Upper Bound	.556

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

d. This is a lower bound of the true significance.

e. Lilliefors' method based on 10000 Monte Carlo samples with starting seed 2000000.

The results show the magnitude of Asymp. Sig. (2-tailed) is 0.200. So that the value of sig. > 0.05, which is able to state that the data distribution is normal.

Multicollinearity Test

This test means that there is a high or almost perfect, even perfect correlation between the free variables, to determine the impossibility of standard errors, so that there will be a habit of estimation. It is said that if there is no correlation between the variables, which this test can be found through the value of *the Variance Inflation Factor* (VIF) with a limit of 10, if it is exceeded, then multicollinearity occurs (Ghozali, 2011:105-106).

Table 4. Multicollinearity Test (*Coefficient)*

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	3.141	1.100		2.854	.017		
	LOG_JUB	.390	.057	1.240	6.867	<.001	.310	3.228
	LOG_NP	-.028	.027	-.107	-1.022	.331	.929	1.076
	LOG_BIRATE	.323	.183	.535	1.765	.108	.110	9.098
	LOG_MODERATE	-.025	.056	-.128	-.450	.662	.125	8.008

a. Dependent Variable: LOG_KURS

Looking at the thickness above, the VIF (*Varionce Inflation Factor*) value shows that all the variables are < 10. This is stated that there is no multicollinearity among the free variables, which is able to provide the fulfillment of the requirements of classical assumptions so that it is able to proceed to the next test.

Heteroskedasticity Test

The purpose of this test is to find out the difference in the residual variance that it observes, which is through white, park, glajser, and graph tests. If the pattern is unclear and the distribution of points is between the top and bottom of the number 0 on the Y axis, then there is no heteroskedasticity (Ghozali. 2011:139-143). The following is an explanation of the results of the test of the classical assumption of heteroskedasticity.

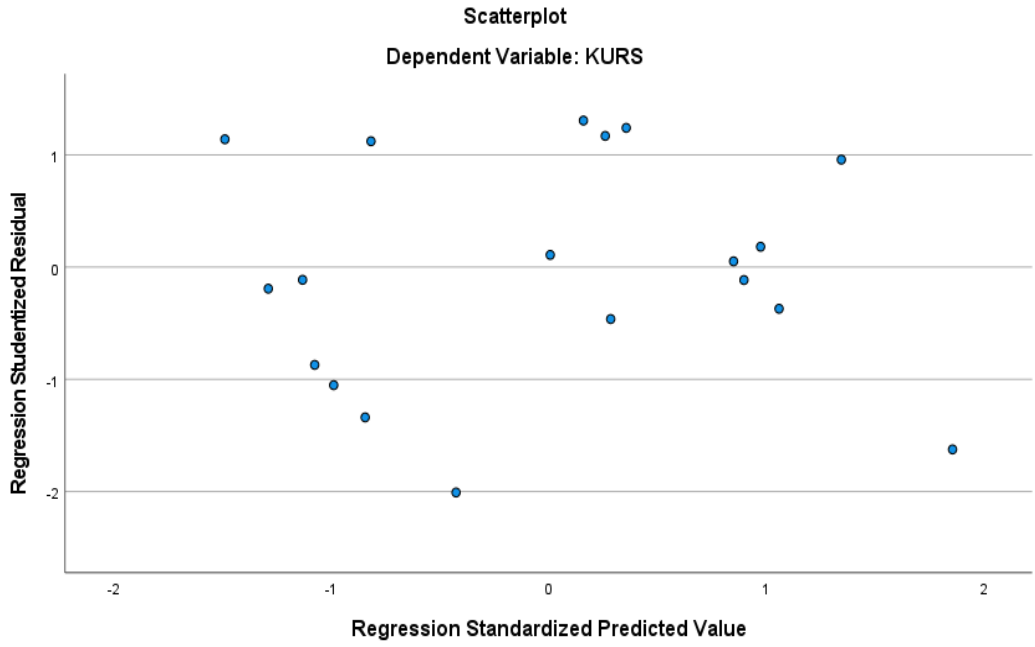

Figure 1. Scatterplot Heteroskedasticity Test

Autocorrelation Test

That is, testing for the presence of symptoms that correlate between all variables from a series of observations whose preparation is carried out based on the time order and the correlation between the disruptive variables. Looking at the opinion (Algifari, 2000:89), this test is through the use of the Durbin Watson test (DW test).

Table 5. Autocorrelation Criteria

Durbin Watson	Conclusion
< 1.08	There is an auto cholera.
1,08 – 1,66	No Conclusion
1,66 – 2,34	No Autocorrelation
2,34 – 2,92	No Conclusion
> 2.92	There is an auto cholera.

Source : Algifari (2000:89)

The results of this DW test are compared through the Autocorrelation Criteria as shown in table 6. The results of Durbin Watson's test are as follows:

Table 6. Autocorrelation Test (*Summary Modelb*)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.961[a]	.923	.893	789.23482	1.189

a. Predictors: (Constant), MODERATE, NP, JUB, BIRATE, INFLASI

b. Dependent Variable: KURS

Table 7. NPar Test

Runs Test

	Unstandardized Residual
Test Value[a]	-78.65157
Cases < Test Value	9
Cases >= Test Value	10
Total Cases	19
Number of Runs	11
Z	.012
Asymp. Sig. (2-tailed)	.990

a. Median

From the calculation results using IBM SPSS Version 27, the DW value was obtained with a magnitude of 1.189. This means that DW is located between 1.08–1.66. This means that there is a model development without conclusions.

Based on the output of SPSS Version 27 above, then after the Runs Test is carried out, the value of Asymps Siq is known. (2-tailed) with a magnitude of 0.990 which means that the value is > 0.05, so there are no symptoms or autocorrelation problems.

The results of the calculation of the logarithm of JUB (X1), Inflation (X2), and Trade Balance (X3), against the Exchange Rate (Y) using BI Rate (M) as the Moderation Variable. Then it was analyzed with the SPSS (*Statistic Package For Social Science*) version 27 program which resulted in the following:

Table 8. Linear Regression Coefficient (*Coefficient)*

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	5669.119	1648.064		3.440	.004
	JUB	.001	.000	1.149	9.557	<.001
	INFLASI	-91.679	182.215	-.152	-.503	.623
	NP	-.031	.011	-.230	-2.863	.013
	BIRATE	344.072	223.004	.322	1.543	.147
	MODERATE	532.085	1643.092	.110	.324	.751

a. Dependent Variable: KURS

Based on the table of calculation results mentioned above, it can be arranged into a structure model of multiple linear regression equations as follows:

Y = 1.149X1 - 0.152X2 – 0.230X3+ 0.322 X4 + 0.110 X5 + e 5.1

Furthermore, the above equation can be explained as follows:

1. The variable coefficient of JUB Products (X_1) with a magnitude of 1.149. This means that if the other bound variable has a constant value and the JUB (X_1) increases by 1 (One) billion rupiah, then the Exchange Rate variable (Y) also increases. So the relationship between the Money Supply increased to 1.149 billion rupiah and the Exchange Rate had a positive value. Factors Causing an increase in the Money Supply can cause Inflation, because there is more money circulating in society, with an increase in the Money Supply, people have more money to buy goods and services, thus increasing demand and by increasing demand, the price of goods and services will also increase, thus causing Inflation. Thus, the Beta coefficient (1.149) indicates that the Increase in Money Supply will increase the exchange rate, thus making imports more expensive and exports more difficult.
2. The variable coefficient of the Trade Balance (X_3) with a magnitude of -0.230. This means that if the other bound variable has a constant value and the Trade Balance (X_3) increases by 1 (One) million US$, then the Exchange Rate variable (Y) also decreases by -0.230 billion rupiah. So the relationship between the Trade Balance and the Exchange Rate has a negative value. The factors causing the increase in the Trade Balance show that exports are greater than imports,

thus increasing the demand for domestic currency, the decrease in the Exchange Rate with the increase in the demand for domestic currency, the Exchange Rate will decrease, thus making exports more competitive. Thus, the Beta coefficient (-0.230) indicates that an increase in the trade balance will lower the Exchange Rate, thereby making exports more competitive and increasing economic growth.

Hypothesis Testing

Determination Coefficient and Correlation Coefficient (R)

Furthermore, measure the close relationship between the variables of JUB, Inflation and Trade Balance to the Exchange Rate variable by calculating the correlation coefficient as follows:

Table 9. Results of Calculation of Determination Coefficient and Correlation Coefficient (*Summary Model*)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.961[a]	.923	.893	789.23482	.923	31.066	5	13	<.001

a. Predictors: (Constant), MODERATE, NP, JUB, BIRATE, INFLASI

The number R = 0.961 shows that there is a close correlation between the Exchange Rate and its independent variables, in this case the variables JUB, Inflation, Trade Balance and BI Rate with a very strong Moderation Variable of 96.1 percent. Meanwhile, R2 (R Square) = 0.923 indicates the success rate of the variables of JUB, Inflation, Trade Balance, BI Rate and Moderating Variables on the Exchange Rate with a magnitude of 92.3% of which there is a remaining 9.7% in the influence of other variables that are not referred to in the variables of JUB, Inflation, Trade Balance and BI Rate with Moderating Variables.

Test F

The simultaneous effect of the variables JUB (X_1), Inflation (X_2), Trade Balance (X_3), BI Rate (X4) and Moderation Variable between BI Rate and Inflation (X_5) on the Exchange Rate (Y) using can be seen and proven by using the F Value Test through *ANOVA variance analysis*.

Table 10. Test Results F (*ANOVAa*)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	96753894.81	5	19350778.96	31.066	<.001[b]
	Residual	8097590.769	13	622891.598		
	Total	104851485.6	18			

a. Dependent Variable: KURS

b. Predictors: (Constant), MODERATE, NP, JUB, BIRATE, INFLASI

In the results of the calculation analysis with the Anova table above, it is known that the Calculated *Value* is 43.751. At the significance level of 0.050, the Ftable value is 0.00 (k - 1 = 3, n - k = 15) so the hypothesis is stated that the effect of JUB (X1), Inflation (X2), Trade Balance (X3), BI Rate (X4) and Moderating Variable (X5) simultaneously on the Exchange Rate.

T test

In order to determine the correctness of the hypothesis submission, it is necessary to test this t to show how far the influence or acceptance of the hypothesis through its independent variables is individually bound, which is seen from the significance value of t for each variable in the *output* of the regression results with a *level of significant of* 0.05.

Table 11. Results of the t-test (*Coefficient)*

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	5669.119	1648.064		3.440	.004
	JUB	.001	.000	1.149	9.557	<.001
	INFLASI	-91.679	182.215	-.152	-.503	.623
	NP	-.031	.011	-.230	-2.863	.013
	BIRATE	344.072	223.004	.322	1.543	.147
	MODERATE	532.085	1643.092	.110	.324	.751

a. Dependent Variable: KURS

Based on the table above, it can be partially interpreted between the free variables, namely the Money Supply (X1), Inflation (X2), Trade Balance (X3), BI Rate (X4) and the Moderation Variable *between* BI Rate and Inflation (X5) to the Exchange Rate as follows:

1. Money Supply (X_1)
   Significance testing through simultaneous testing whose significance level is 0.050 where the calculation of 9.557 is with a result of 0.000 < 0.050, thus JUB (X1) is proven to have a significant and partial effect on the Exchange Rate in Indonesia. Meanwhile, if you compare the value of the calculation value of 9.557, it shows that it has a strong positive relationship between the JUB and the Exchange Rate is greater than the table of 1.149. Because of the calculation > the table, there was a rejection of H0 and H1 accepted. The implications of the statistical explanation of the significance of the JUB variable to the Exchange Rate in Indonesia, the change in the JUB that significantly affects the Exchange Rate and the increase in the JUB causes an increase in the Exchange Rate (the domestic currency weakens) which can trigger Inflation and affect economic stability.
2. Inflation (X_2)
   Significance testing through simultaneous testing whose significance level is 0.050 where the calculation of -0.503 is with a result of 0.623 > 0.050, then Inflation (X2) is proven to partially have no significant effect on the Exchange Rate in Indonesia. Meanwhile, if you compare the value of -0.503 Inflation to the Exchange Rate, it is smaller than the -0.152 table. Because of the calculation > the table, H0 is rejected and H1 is accepted. The implication of the statistical explanation of the variable Inflation is not significant to the Exchange Rate in Indonesia,

Inflation is not a determining factor of the Exchange Rate, the increase in Inflation does not directly affect the decline in the Exchange Rate and Inflation can affect people's purchasing power and economic growth.

3. Trade Balance (x_3)
   Significance testing through simultaneous testing whose significance level is 0.050 where the calculation of -2.863 is with a result of 0.013 < 0.050, thus the Trade Balance (X3) is proven to have a significant and partial influence on the Exchange Rate in Indonesia. Meanwhile, if you compare the value of the calculation of -2.863 Trade Balance to the Exchange Rate, it is smaller than the table of -0.230. Because of the calculation > the table of rejection on H0 and H1 are accepted. The implication of the statistical explanation of the significance of the Trade Balance variable to the Exchange Rate in Indonesia, the increase in the Trade Balance (surplus) causes the Exchange Rate to decrease, there are other factors such as Inflation, Interest Rates, and Fiscal Policy also affect the Exchange Rate.
4. BI Rate (M)
   Significance testing through simultaneous testing whose significance level is 0.050 where the calculation of 1.543 is with a result of 0.147 > 0.050, then the BI Rate (M) is proven to have no significant and partial influence on the Exchange Rate in Indonesia. Meanwhile, if you compare the value of the calculation of 1.543 BI Rate to the Exchange Rate, it is smaller than the table of 0.322. Because of the calculation > the table of rejection on H0 and H1 are accepted. The implication of the statistical explanation means that there is no significance in the BI Rate variable to the Exchange Rate in Indonesia, the increase in the BI Rate does not directly affect the increase in the Exchange Rate and monetary policy is ineffective in controlling the Exchange Rate through the BI Rate.
5. BI Rate Inflation Moderation to Exchange Rate
   Significance testing using the t-test with a significance level of 0.050 where the calculation of 0.324 is with a result of 0.751 > 0.050, then the BI Rate (Z) is proven to have no significant and partial influence on the Exchange Rate in Indonesia. Meanwhile, if you compare the value of 0.110 BI Rate to Inflation and the Exchange Rate is smaller than the table 0.324. Because of the calculation > the table of rejection on H0 and H1 are accepted. This means that the BI Rate variable is not a moderation of Inflation and Exchange Rates in Indonesia, the increase in the BI Rate can affect interest rates, loans and economic growth and the existence of other factors such as trade balance, fiscal policy and interest rates are more influential and do not directly affect the BI Rate on Inflation and Exchange Rates.

Determination of Moderating Variables

Interaction Test

In other words, *Moderated Regression Analysis* (MRA), which is a special instrument for testing linear multiple regression models with more than one independent variable element (or multiplied by two) (Suliyanto, 2011:7). If the result of the multiplication is significant, the variable will bring moderation of the relationship between the free and bound variables.

Table 12. Interaction Test (*Coefficient)*

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	17781.927	2688.934		6.613	<.001
	INFLASI	-637.956	451.068	-1.056	-1.414	.178
	BIRATE	-665.002	519.171	-.623	-1.281	.220
	MODERATE	5379.395	4091.768	1.113	1.315	.208

a. Dependent Variable: KURS

Looking at the table above, it is known that the BI Rate will increase Inflation and Exchange Rate. Significance testing using the Interaction Test with a significance level of 0.050. Based on the results of *the Moderated Regression Analysis* (MRA) or Interaction Test, the calculated value for the moderation variable is known to be 1.315 with a significance of 0.208, so the probability variable cannot bring the correlation between the BI Rate and Inflation to the Exchange Rate.

The Effect of Money Supply on Exchange Rates

Significance testing with the t-test whose significance level is 0.050 where the calculation of 9.557 is with a result of 0.000 < 0.050, then JUB (X1) is partially proven to have a significant influence on the Exchange Rate in Indonesia, in the sense that the JUB variable is significant to the Exchange Rate in Indonesia. This is supported by empirical findings in emerging markets where monetary *aggregates* often affect nominal exchange rates significantly (Bahmani-Oskooee & Saha, 2015). Similar conclusions are also highlighted in studies focused on Southeast Asia, confirming the short-run and long-run relationships between the money supply and exchange rate fluctuations (Sulaiman & Hussin, 2012). The result affirms the monetarist view that expansionary monetary policy has immediate effects on currency values (Mishkin, 2007). The use of t-test in macroeconomic variable interaction analysis is widely adopted and validated in several econometric models (Gujarati & Porter, 2009). In the Indonesian context, the correlation between JUB and exchange rate was also confirmed by previous works that assessed financial volatility (Handoyo & Wahyudi, 2020).

In other words, when JUB increases, output also increases. Which is shown by the increase in the JUB, the exchange rate will also increase with the depreciation of the value of the rupiah currency against the US dollar, it applies the other way around, if the JUB decreases, then the exchange rate will also fall so that there will be appreciation. This pattern aligns with the Quantity Theory of Money as originally proposed by Irving Fisher, which posits that an increase in the money supply, ceteris paribus, leads to a proportional increase in prices (Fisher, 1911). As domestic money supply grows, inflationary pressure increases, impacting trade balances and exchange rate stability (Dornbusch, 1976). Exchange rate depreciation can also be explained through the purchasing power parity theory when excessive monetary growth reduces the real value of currency (Rogoff, 1996). Contemporary macroeconomic research continues to affirm the relevance of money supply shocks in driving nominal exchange rate movements in open economies (Christiano

et al., 2005). A recent Indonesian study confirmed that increasing JUB pushes up inflation, which in turn leads to weakening of the rupiah against the dollar (Kurniawan & Damayanti, 2020).

This research is in accordance with the hypothesis, based on previous research, namely from Nurul Hazizah, Zainuri, Sebastiana Viphindratin (2017), saying that there is a positive and significant influence of JUB on the change in the exchange rate of the rupiah against the US dollar, this means that every increase in the amount of domestic money will have an impact on depreciation or increasing demand for the rupiah, which if the government provides an increase in the JUB, people spend money consumptively, so that domestic inflation due to rising prices and the rupiah offered will rise, will also provide declining interest rates so that investors can invest outside of domestic so that there is an outflow of funds and exchange rate depreciation. Similar conclusions were drawn by Tiwari et al. (2013) who observed significant capital flight and depreciation effects in response to monetary expansion in developing countries. Expansionary monetary policy often leads to lower interest rates, prompting investors to shift capital to countries with higher yields (Obstfeld & Rogoff, 1995). The Mundell-Fleming model also supports this interaction, where open capital markets and lower domestic interest rates trigger currency outflows (Blanchard & Johnson, 2013). Recent research also indicates that inflationary expectations induced by excessive JUB growth weaken the currency through psychological and speculative market reactions (Ajayi & Mougoue, 1996). These dynamics highlight the importance of a balanced money supply policy to avoid exchange rate instability.

The Effect of Inflation on the Exchange Rate

Significance testing with the t-test whose significance level is 0.050 where the calculation -0.503 is with a result of 0.623 > 0.050, then Inflation (X2) is proven to partially have an insignificant effect on the Exchange Rate in Indonesia. This means that the Inflation variable is not significant to the Exchange Rate in Indonesia.

The consequences of fluctuating exchange rates with changes in the inflation rate cause changes in domestic interest rates to go up and down, which has an impact on the flow of state funds, which results in the demand and bidding of a currency exchange rate. With this high inflation, it is able to suppress so that the domestic currency depreciates, thereby reducing the interest of foreign investors to invest their capital in stocks with this currency.

With high inflation, it will have an impact on the increase in the price of goods so that its competitiveness will be reduced in the world market and the purchase of imported goods will increase due to cheaper prices of these goods as a result of high domestic inflation compared to in the country.

This research is in accordance with the hypothesis based on previous research, namely from Rebekah BR Silitonga, Zulkarnain Ishak, Mukhlis (2017), said that there is a negative and insignificant influence of inflation on the exchange rate. The high inflation that occurs will have an impact on the increase in the price of goods which makes there is no competitiveness in the world market, which will also cause consumer interest in buying imported products.

The Effect of Trade Balance on Exchange Rates

Significance testing with the t-test whose significance level is 0.050 where tcount -2.863 is with a result of 0.013 < 0.050, then the Trade Balance (X3) is proven to partially have a significant

effect on the Exchange Rate in Indonesia. This means that the Trade Balance variable is significant to the Exchange Rate in Indonesia.

The influence on Indonesian exports with the exchange rate of the rupiah or US dollar is because the activity of these exports has an influence on the *demand* of the country's currency, which with this increasing exports and *demand* for the country's currency, the currency will be strengthened, which sees the opinion of the Mundell-Fleming, in theory, explained that the rupiah exchange rate depreciated so that it became weak, it was able to improve its position in its balance of payments even on a small scale.

The improvement of the depreciated exchange rate is carried out by expanding exports and lowering the import level, with other conclusions showing that there is import sensitivity to the depreciated exchange rate and there is a positive value of its exports adjusted to the trade balance process, so that the depreciated exchange rate is able to have a positive impact on Indonesia's balance of payments

This research is in accordance with the hypothesis Based on previous research, namely from Selpianus Fordatkosu, Robby Joan Kumaat Dennij Mandeij (2021), said that the influence of the trade balance on the exchange rate in Indonesia, in accordance with the theory of *balance of payment,* often this trade balance is a factor that encourages the increase and decline of the domestic currency exchange rate, with the possibility of depreciation (if it rises), On the other hand, if the trade balance falls, it will experience a deficit and the domestic currency will appreciate.

The Influence of BI Rate as a Moderating Variable on Inflation and Exchange Rates

Based on the results of *the Moderated Regression Analysis* (MRA) or Interaction Test, per the calculated value for the moderate variable is known to be 1.315 with a significance of 0.208, so the probability variable is not able to affect the relationship between the BI Rate and Inflation Against the Exchange Rate.

The increase in the BI Rate will affect the increase in inflation, as well as if there is a decrease in the BI Rate, inflation will also decrease, which makes a monetary policy related to the BI Rate more carefully implemented. Rotheli (2019) in his research also gave an opinion and the results of the influence of the exchange rate on inflation, Ekananda himself (2014:168) argued that an exchange rate is the rate for currencies that are on average for the currencies of other countries which have an important role in making decisions in spending expenses, to find out the translation in the same sense of prices in countries around the world.

This research is in accordance with the hypothesis Based on previous research, namely from I Kadek Arya Diana, Ni Putu Martini Dewi (2018), said that the uncertainty of the influence of falling and rising interest rates on changes in exchange rates, which if the domestic interest rate increases, depreciates the rupiah exchange rate and reduces investor interest and investors will be more interested in investing abroad provide the flow of funds to depreciate the exchange rate. Theoretically, the relationship between these two variables can be known to be explained by the change in interest rate will have an impact on the expected return of the investment, if the interest rate is getting higher, then the expected result is also higher so that the flow of funds from abroad will enter and provide strength for the exchange rate of local currencies against foreign currencies (Noor, 2014).

CONCLUSION

Based on the analysis presented in this research, it can be concluded that the Money Supply significantly affects the Exchange Rate in Indonesia, where an increase in JUB leads to the depreciation of the rupiah against the US dollar, and a decrease results in appreciation. Inflation, on the other hand, does not significantly influence the exchange rate, although exchange rate fluctuations due to inflation can cause variations in domestic interest rates and currency market dynamics. The Trade Balance also has a significant impact, acting as a key driver of exchange rate fluctuations, with trade surpluses potentially leading to depreciation and deficits resulting in appreciation. Meanwhile, the BI Rate does not have a significant moderating effect on Inflation and Exchange Rates, indicating that although theoretically changes in interest rates affect investment returns and capital inflows, in this study the BI Rate did not play a moderating role.

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