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The Effect of Foreign Exchange Reserves and Credit Default Swap on Exchange Rate in Indonesia

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Abstract

This study aims to determine how the effect of foreign exchange reserves and credit default swap (CDS) on exchange rate in Indonesia. The exchange rate is the dependent variable in this study. Foreign exchange reserves and CDS are the independent variables in this study. The type of research used is descriptive quantitative with the Vector Error Correction Model (VECM) regression method. The data used is secondary data. The data used in this study are time series data in the form of foreign exchange reserves data represented by Bank Indonesia's International Reserve (IRFCL) every month 2015-2023, Indonesia's 5 Years credit default swap data every month 2015-2023, and rupiah exchange rate data against the US dollar every month 2015-2023. The results showed that the independent variable of foreign exchange reserves in the long term has no effect on the dependent variable of the exchange rate. Furthermore, it is obtained that variable CDS in the long term have a significant positive effect on the dependent variable of the exchange rate. And in the short term the independent variable of foreign exchange reserve and CDS has no effect on the dependent variable of the exchange rate.

Keywords: Exchange Rate; Foreign Exchange Reserves; Credit Default Swap

1. Introduction

Exchanges rates in Asian countries experienced a high depreciation against the US Dollar in 2024 [1]. The weakening of theexchange rate is also felt by Indonesia. The upward trend in the rupiah exchange rate resulted in a decline in Indonesia's foreign exchange reserves. The decline in the position of foreign exchange reserves is not only influenced by the stabilization of the rupiah exchange rate, but also by the payment of government foreign debt [2]. Likewise, the 5-year Indonesian credit default swap premium increased in 2024 [3].

In the globalization of economic relations and financial interconnectedness between countries, the progress of foreign exchange reserves, credit default swaps, and exchange rates plays an important role. These relationships are critical to understanding financial stability, managing economic policy, and mitigating risks associated with external shocks. Any deterioration in these indicators can cause negative effects on economic stability, financial stability, and price stability. Therefore, countries must pay close attention and fully control these indicators to prevent any adverse effects [4].The exchange rate is one of the macro indicators that is highly sensitive to changes in the external economy. Because the global economy is affected by the value of currencies, which shows the strength of the economy. Exchange rate are very important for trade between countries as economies between countries are more open. This is important for the world's largest free market economy [5]. Also, foreign exchange reserves have an important role to play in protecting the domestic banking sector, and the domestic credit market more broadly, while limiting external currency depreciation. The need for such protection is increasing given the many risks in a financially open economy [6]. Moreover, credit default swap (hereafter abbreviated CDS) is one of the credit derivative instruments that serves as a hedging and speculation. CDS can be used to transfer the risk of default on assets under management to a third party. CDS is used by investors to assess the risk of a country in addition to referring to a company or asset instrument [7].

Most developed countries have stable trends in these in indicators, while some developing countries have fluctuating trends, such as Indonesia. The following is data on Indonesia's exchange rate, foreign exchange reserves, and CDS from 2010-2023.

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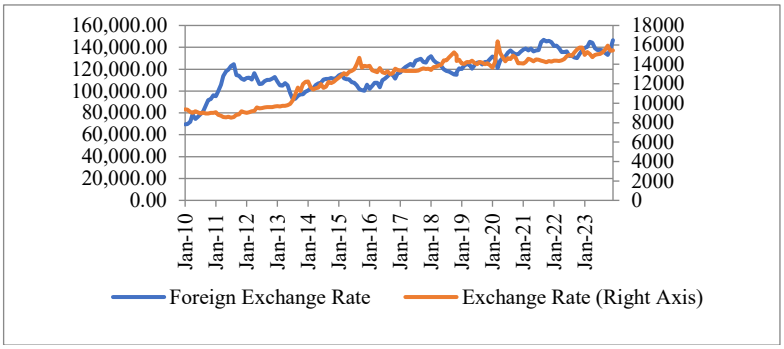

Figure 1. The development of foreign exchange reserves and the exchange rate of the Rupiah against the US Dollar in Indonesia
Source: Bank Indonesia

Figure 1 shows the development of foreign exchange reserves and the exchange rate of the rupiah against the US dollar in Indonesia, where foreign exchange reserves are denoted in blue and the exchange rate is denoted in red. Figure 1.1 implies that there is a negative relationship between foreign exchange reserves and exchange rates in Indonesia. When the exchange rate increase, it is inversely proportional to the foreign exchange reserves decreasing. This is in accordance with research [8] which shows that if a country's foreign exchange reserves are low, the central bank cannot use foreign exchange reserves to maintain the stability of the exchange rate. This can cause the country's currency exchange rate to depreciate and potentially trigger a financial crisis. Research [9] also revealed that the rupiah exchange rate against the US dollar has a significant negative relationship with foreign exchange reserves.

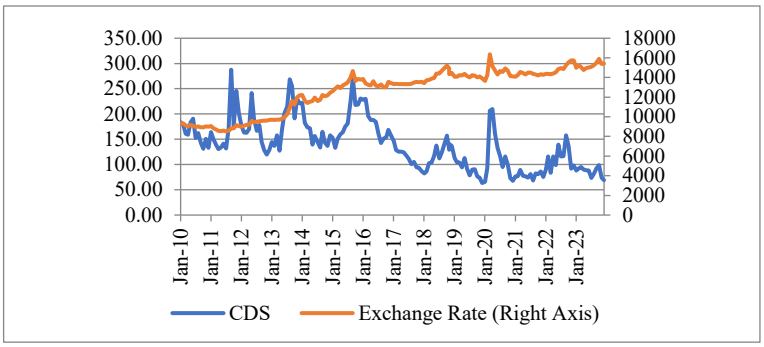

Figure 1.2 The development of CDS and the exchange rate of the Rupiah against the US Dollar in Indonesia
Source: Bank Indonesia and Investing.com

Figure 2 shows the development of CDS and the exchange rate of the rupiah against the US dollar in Indonesia, where the CDS are denoted in blue and the exchange rate is denoted in red. Figure 1.2 implies that there is a positive relationship between CDS and exchange rates in Indonesia. When the CDS increases, the exchange rate increases. This is in accordance with research [10] which states that the depreciation of the domestic currencyagainst the US dollar increases sovereign risk as measured by CDS. In research [11] also stated that the CDS response was influenced more quickly by the banking sector (with the exchange rate as one of its variables) than the real sector. This phenomenon shows that in the event of global economic turmoil, a rapid shock will quickly affect the exchange rate.

There is a prominent study that examines the dynamic relationship between three important macroeconomic and financial stability indicators namely foreign exchange reserves, CDS, and exchange rates simultaneously in Turkey. According to [4], there is a time-frequencydependence between foreign exchange reserves, CDS spread, and exchange rate; a bidirectional relationship between foreign exchange reserves and exchange rate is found,between exchange rates and CDS spreads, and between CDS spreads and foreign exchange reserves, and there are indications of relationships in most quantiles except some lower and middle quantiles for some indicators.

This study aims to analyze the effect of foreign exchange reserves on exchange rates in Indonesia in the short term and long term, and to analyze the effect of CDS on exchange rates in Indonesia in the short term and long term.

2. Literature Review

2.1 Mundell-Fleming Model

The Mundell-Fleming model is an advanced model of the IS-LM model. Both models emphasize the interaction of the goods market and the money market. Both models assume that the price level is fixed and then show the causes of the short-run

fluctuations in aggregate income, or shifts in the aggregate demand curve. The difference between the two modes is the IS-LM model assumes a closed economy, while the Mundell-Fleming model assumes an open economy. The Mundell-Fleming model extends the short-run income model by adding the impact of international trade and finance.

The Mundell-Fleming model makes the assumption that the economy under study is a small open economy with perfect capital mobility. That is, the economy has the ability to borrow and borrow in theglobal money market. As a result, the interest rate of the economy is determined bythe world interest rate. Mathematically, the interest rate is equal to the world interest rate: $r = r*$. Since the economy is smaller than theglobal economy, countries can borrow or lend in the international money market without affecting the interest rate.As a result, theworld interest rate is assumed to be exogenously fixed.

Two equations can be explained by the Mundell-Fleming model for a small open economy with perfect capital mobility:

$$Y = C(Y - T) + I(r) + G + NX(e) \quad \text{IS*},$$

$$\frac{M}{P} = L(r^*, Y) \quad \text{LM*}.$$

The first equation addresses equilibrium in the goods market, and the second equation addresses equilibrium in the money market. Fiscal policy (G) and (T), monetary policy (M), the price level (P), and global interest rate (r*) are exogenous variables, while income (Y) and exchange rate (e) are endogenous variables [12].

The exchange rate system

The system used by a country's monetary authority to regulate the exchange rate of the country's currency against foreign currencies is known as an exchange rate system. Three different categories of exchange rate systems exist. The first is an absolute fixed exchange rate system, the second is a pure floating exchange rate system, and the last is a pure floating exchange rate system [13].

Floating Exchange Rate

The characteristics of the exchange rate in a floating exchange rate system are determined by the market and are allowed to change freely according to changes in economic conditions. In certain situations, the exchange rate (e) changes to achieve simultaneous equilibrium in the money market and goods market. The Mundell-Flemming model is used to show the effect of policy changes and to understand the way economic forces function as the economy moves from one equilibrium to another.

Fixed Exchange Rate

One of the features of a fixed exchange rate system is that the central bankannounces the exchange rate and is prepared to buy and sell domestic currency to keep the exchange rate fixed at the announced level. Thus, the main principle of a fixed exchange rate system is the central bank's commitment to allow the money supply to change at the desired rate to ensure the equilibrium exchange rate equals the announced exchange rate.

2.2 Sovereign Risk

Sovereign risk according to [7] is the risk of defaulting on debt and interest payments by a country. Sovereign risk poses a major challenge to the banking system and financial stability of a country in general.Sovereign risk is influenced by domestic and foreign conditions. The source of this risk can come from economic conditions, political stability, and external factors. Unstable economic conditions, such as high inflation, unemployment, or market uncertainty, can undermine public and investor confidence in the government, which in turn can trigger social and political instability.

Sovereign risk can have consequences such as increased borrowing costs, exchange rate depreciation, and financial crises. Increased borrowing costs occur when investors and financial institutions perceive higher risks associated with a country's political and economic stability. This can cause them to demand higher returns to compensate for the risk, so the cost of debt for the government and private sector increases [14]. Exchange rate depreciation may occur in response touncertainty generated by sovereign risk. When investors lose confidence in a country, they tend to withdraw their investments, which can lead to a decrease in demand for the local currency. As a result, the exchange rate may weaken, which in turn may increase the cost of imports and trigger inflation [11]. Financial crises can arise as a result of a combination of these factors.When borrowing costs increase and the exchange rate weakens, the financial sector and companies that have foreign currency-denominated debt mayexperience difficulties.If this situation is not handled properly, it can lead to bankruptcy, mass unemployment, and instability, which furtherexacerbate sovereign risk and create a negative cycle that is difficult to recover from. Therefore, it is important for the government to manage sovereign risk carefully in order to maintain sovereigntyrisks carefully in order to maintain economic stability and investor confidence.

Sovereign risk can be measured by several indicators such as credit rating, and CDS. Credit rating is an assessment made by rating agencies in showing the company's financial condition or the company's ability to pay obligations. Recognized rating agencies are Moody's Investors Services, Fitch Rating, Standard & Poor's, and others.Another indicator that can measure sovereign risk is the credit default swap (CDS),which is a financial instrument that allows investors to hedge against the risk of default.. CDS

functions as a contractbetween two parties, where one party pays a premium to the other party to get protection against the possibility of default.The higher theCDS premium paid, the greater the market's perception of the entity's default risk. As such, CDS can provide an idea ofhow much risk is perceived to be associated with a country's debt, and is often used by investors to assess a country's financial stability and sovereignty.

3. Research Method

This research is a descriptive type of research and uses quantitative methods. The type of data used is secondary data. The secondary data used in this study are time series data in the form of foreign exchange reserve data represented by Bank Indonesia's International Reserve (IRFCL) every month 2015-2023, Indonesia's 5 Years credit default swap data every month 2015-2023, and Rupiah exchange rate data against the US dollar every month 2015-2023.This study uses one variabledependent variable and two independent variables.The dependent variable in this study isExchange Rate (ER), while theindependent variables in this study areforeign exchange reserves (FER),andcredit default swap (CDS).

This study analyzes the effect of foreign exchange reserves and credit default swaps on exchange rates in Indonesia using the Vector Error Correction (VECM) method with the help of Microsoft Office Excel 2019 and Eviews12. VECM is a Vector Autoregressive (VAR) that is intended to be used on non-stationary data that is known to have a cointegration relationship [15].For the modelthat will be used to determinethe effect of foreign exchange reserves and credit default swaps on exchange rates in Indonesia:

$$\Delta ER = \alpha + \beta_1 ER_{t-1} + \beta_2 FER_{t-1} + \beta_3 CDS_{t-1} + \gamma ECT_{t-1} + \varepsilon_t$$

4. Results and Discussion

4.1 Results

4.1.1 Descriptive Statistics

An overview of the research data through descriptive statistics is presented in table 1.

Table 1. Descriptive Statistics

Variable	Year	MIN	MAX	MEAN	STD. DEV.
Exchange Rate	2015	12625	14657	13457,58	571,303
	2016	12998	13846	13329,83	252,8355
	2017	13319	13572	13398,17	100,7552
	2018	13413	15227	14267,33	539,7
	2019	13901	14385	14130,58	129,9164
	2020	13662	16367	14625,25	682,7177
	2021	14084	14572	14344,92	142,3756
	2022	14349	15737	14916,75	534,1852
	2023	14751	15916	15218,75	311,745
Foreign Exchange Reserves	2015	100240,5	115527,3	107708,3	5112,521
	2016	102133,9	116361,5	109899,5	4848,423
	2017	116890,1	130196,4	124876,2	4051,306
	2018	114847,5	131979,6	121481	5356,534
	2019	120075,2	129183,3	124628,1	2623,12
	2020	120968,9	137041,3	131970,5	4354,265
	2021	136398	146870	140949,9	4170,073
	2022	130197	141435,2	135506,5	3825,061
	2023	133139,8	146383,8	139428,4	4035,514
Credit Default Swap	2015	1,33	2,72	1,90	0,42
	2016	1,42	2,3	1,79	0,29
	2017	0,87	1,47	1,13	0,18
	2018	0,82	1,57	1,19	0,23
	2019	0,63	1,13	0,91	0,16
	2020	0,66	2,09	1,20	0,50
	2021	0,68	0,89	0,79	0,06
	2022	0,83	1,58	1,13	0,22
	2023	0,69	0,99	0,87	0,10

Source: Microsoft Office Excel Processed Data

Based on table 1, the results of descriptive statistical estimation state that the highest mean value of exchange rates, foreign exchange reserves, and CDS is IDR15,218.75 in 2023, 140.9 billion US Dollars in 2021, and 1.9% in 2015. The highest maximum values of the exchange rate, foreign exchange reserves, and CDS were IDR15,916 in 2023, USD 146.8 billion in 2021, and 2.72% in 2015. The minimum values of the exchange rate, foreign exchange reserves, and CDS are IDR12,625 in 2015, USD100.2 billion

in 2015, and 0.63% in 2019. In addition, the highest standard deviation values of exchange rates, foreign exchange reserves, and CDS are 682.718 in 2020, 5112.521 in 2015, and 0.5% in 2020.

4.1.2 StationaryTest

The first step in VECM is stationary test. Stationary tests are conducted to overcome spurious regression in time series data. This research uses the Augmented Dickey-Fuller (ADF) test to analyze the stationary of the data. The data is stationary if the ADF Statistic is greater than the Critical Value (ADF Statistic> Critical Value).

Table 2. Stationary Test Results

Variable	Level			First Difference (1st Diff)		
	ADF Statistic	Critical Value	Result	ADF Statistic	Critical Value	Result
ER	-2.746518	-2.888669	Not Stationary	-11.89131	-2.888932	Stationary
FER	-0.880169	-2.888669	Not Stationary	-9.234104	-2.888932	Stationary
CDS	-2.355325	-2.888669	Not Stationary	-10.15495	-2.888932	Stationary

Source: Eviews 12 Processed Data

Based on table 2 stationary test results, it is found that at thelevel there are no stationary variables. This can be seen from the ADF Statistic that all variables are smaller than the Critical Value at the level. At the first differenceall variables are found to be stationary. This is evidenced by the ADF Statisticis greater than the Critical Value.

4.1.3Determination of the Optimal Lag

Determination of the optimal lag is done to find out how long the variable reaction to other variables. Testing the lag length in this study is based on the smallest Akaike Information Criterion (AIC) criteria. Based on the determination of the optimal lag results in table 3, it shows that this research model is optimal at lag 1.

Table 3. Optimal Lag Determination Results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1595.293	NA	2.12e+10	32.28874	32.36738*	32.32056*
1	-1583.055	23.48589*	1.98e+10*	32.22334*	32.53790	32.35061
2	-1578.915	7.695580	2.19e+10	32.32151	32.87199	32.54423

Source: Eviews 12 Processed Data

4.1.4VAR Stability Test

VAR stability test serves to analyse the stability of the mode because if the VAR estimation results are unstable then the IRF and VD analysis becomes invalid. A VAR system is said to be stable if all roots have a modulus of less than one. Table 4 shows that the VAR system is stable because the modulus has a distance of less than one, which ranges from 0.09-0.25, so that the VAR model can be concluded that the optimal lag is stable.

Table 4. Stability Test Result

Root	*Modulus*
-0.190472 – 0.166201i	0.252789
-0.190472 + 0.166201i	0.252789
0.092388	0.092388

Source: Eviews 12 Processed Data

4.1.5Cointegration Test

The cointegration test is conducted to determine whether there is a relationship between the variables, especially in the long run. If there is cointegration in thevariables used in the model, then this indicates that there is a long-runrelationship among the variables. The Johansen Cointegration method is usedto test for cointegration. This cointegration test compares the trace statisticwith a critical value of 0.05. If the trace statistic result is greater than the critical value then there is cointegration in the system of equations. Table 5 shows the existence of cointegration between the exchange rate (ER), foreign exchange reserves (FER), and credit default swap (CDS) to continue this research these results will be clarifiedusing VECM analysis.

Table 5 Cointegration Test Result

Hypothesized No. of CE (s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.480984	168.8366	29.79707	0.0000
At most 1	0.426756	99.97542	15.49471	0.0000
At most 2	0.326793	41.54876	3.841465	0.0000

Source: Eviews 12 Processed Data

4.1.6 Granger Causality Test

The Granger causality test aims to test the causal relationship and this test does not estimate the model. The results show that there is a relationship between variables if the probability is less than the alpha value of 0.05.

Table 6 Granger Causality Test Result

Null Hypothesis:	Obs	F-Statistic	Prob
D_CDV does not Granger Cause D_NT	106	0.37678	0.5407
D_NT does not Granger Cause D_CDV		0.01113	0.9162
D_CDS does not Granger Cause D_NT	106	0.41078	0.5230
D_NT does not Granger Cause D_CDS		4.97267	0.0279
D_CDS does not Granger Cause D_CDV	106	0.82542	0.3657
D_CDV does not Granger Cause D_CDS		2.38048	0.1259

Source: Eviews 12 Processed Data

Based on table 4.6, it can be concluded that the development of exchange rates has a statistically significant one-way relationship to the development of CDS but not vice versa. This is measured by the probability which is smaller than the alpha value which is 0.0279<0.05. And other variables statistically do not have a causal relationship with other variables.

4.1.7 Modeling Vector Error Correction Model (VECM)

VECM estimation in this study can explain the long-term and short-term effects between the exchange rate as the dependent variable, and foreign exchange reserves and credit default swaps as independent variables. The t-test is conducted at a level of significant (α) 5% with a t table value of 1.98. In making a decision, if the t statistical value |t statistics| > |t table|, it has a significant effect.

Table 7. VECM Estimation Result

Variable	Coefficient	t-Statistics	Description
	Long Term		
ER(-1)	1.000000		
FER(-1)	0.012854	[0.37239]	Not Significant
CDS(-1)	1988.742	[2.12890]	Significant
C	-18193.07		
	Short Term		
CointEq1	-0.138209	[-3.74489]	Significant
D(NT(-1))	-0.130592	[-0.98501]	Not Significant
D(CDV(-1))	-0.012418	[-0.85297]	Not Significant
D(CDS(-1))	59.47038	[0.26669]	Not Significant
C	30.72141	[0.89941]	

Source: Eviews 12 Processed Data

The VECM estimation results in table 7 above show that in the long run statistically the development of CDS significantly positively affects the development of exchange rates. The model estimation results show that the CDS coefficient is 1988.742 with a positive sign, which means that every 1 point increase in CDS development will increase the exchange rate development by 1988.742. On the other hand, in the long run, the development of foreign exchange reserves statistically has no effect on the development of the exchange rate. This is shown by the value of t-statistic is smaller than the value of t-table which is 0.37<1.98.

While in the short term, the development of the exchange rate on lag 1,foreign exchange reserves on lag 1, and CDS on lag 1 statistically have no effect on the exchange rate development variable. This is due to the small value of t statistics from the value of t table. The ECT result shown by Cointeq1 has a statistical t value greater than the t table value, namely ([-3.7]>[1.98]). This indicates that ECT has a significant relationship at the 95% confidence level. The negative ECT coefficient indicates that there is a correction mechanism that works to return the system to a long-termequilibrium. The ECT coefficient value of -0.13 indicates that every period about 13% of the imbalance will be corrected. These results indicate that the VECM model used is valid and there are adjustments to the short-term model to achieve long-termequilibrium.

4.1.8Impulse Response Function (IRF)

The rate of one variable shock to another variable in a certain time span can be observed using IRF analysis. IRF analysis is used to show the effect of a variable shock on other variables until the effect disappears or returns to the equilibrium point.

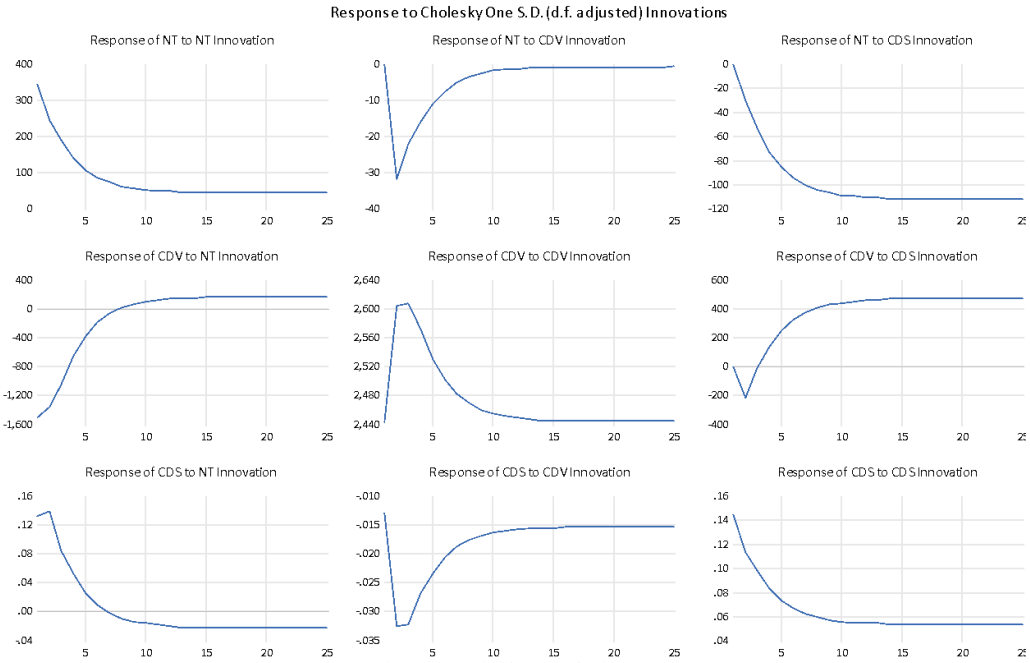

Figure 3 Variables shocks in IRF
Source: Eviews 12 Processed Data

Based on figure 3 the first row of IRF analysis of the exchange rate for the next 25 months as follows:

- The exchange rate responded negatively to shocks from itself where in the second period it rose and fell to 245.65. Furthermore, it shows a decline in value throughout the period. Stability began to be shown in the seventeenth period at 43.96.
- The exchange rate responded negatively to the shock of foreign exchange reserves where in the second period it fell by -31.87. In the third period, the exchange rate responded negatively to foreign exchange reserves shocks where in the second period it decreased by -31.87. In the third period it increased to -22.12. The stability began to be shown during the seventeenth period of -0.89.
- The exchange rate responded negatively to the CDS shock where in the second period it fell by -31.2 percent. Furthermore, it shows a decline in value throughout the period. The stability began to be shown during the twenty-second period at -111.9.

The second row of IRF analysis of the foreign exchange reserves for the next 25 months as follows:

- Foreign exchange reserves responded positively to shocks from the exchange rate where in the second period it rose to -1367.22. Furthermore, it shows an increase in value throughout the period. The stability began to be shown during the twenty-first period at 159.18.
- Foreign exchange reserves responded positively to shocks from itself in the second period at 2604.03. In the fourth period, it decreased from the previous period to 2572.4. Stability began to be shown during the seventeenth period at 2444.77.
- Foreign exchange reserves responded negatively to CDS shocks where in the second period it fell by -221.46 percent. In the fourth period, it increased by 138.19. Furthermore, it shows an increase in value throughout the period. Stability began to be shown during the nineteenth period of 469.

The third row of IRF analysis of CDS for the next 25 months as follows:

- CDS responded positively to the exchange rate shock where in the second period it rose by 0.13. In the third period it decreased to 0.08. Furthermore, it shows a decrease in value throughout the period. The stability began to be shown during the seventeenth period of -0.02.
- CDS responded negatively to the foreign exchange reserves shock where in the second period it fell by -0.03. In the fourth period it increased to -0.02. The stability started to be shown during the twelfth period at -0.015.
- CDS responds negatively to shocks from itself where in the second period it falls by 0.11. Furthermore, it shows a decrease in value throughout the period. The stability started to be shown during the thirteenth period at 0.053.

4.1.9Variance Decomposition (VD)

The purpose of doing VD is to find out how well one variable can explain another variable or the variable itself.

Table 8. VD Analysis Result of Exchange Rate

Period	Exchange Rate	Foreign Exchange Reserve	CDS
1	100,00	0,00	0,00
2	98,90	0,55	0,53
3	97,62	0,68	1,69
4	95,59	0,71	3,68
5	93,06	0,71	6,21
6	90,24	0,69	9,06
7	87,30	0,66	12,02
8	84,37	0,63	14,98
9	81,54	0,61	17,83
10	78,84	0,58	20,56

Source: Eviews 12 Processed Data

Based on the results of VD, the exchange rate development has a dominant rolein explaining the exchange rate movement in the long run. The development of foreign exchange reserves has a small role on the development of exchange rates, this confirms that foreign exchange reserves have an insignificant contribution in explaining changes in exchange rates. Meanwhile, the development of CDS has a considerable contribution to the development of the exchange rate. This shows that CDS shocks play an important role in influencing the exchange rate in the long run.

4.2 Discussion

4.2.1 Effect Foreign Exchange Reserves on Exchange Rate

Based on the results of VECM testing, it can be seen that in the long term the development of foreign exchange reserves has no significant effect on the development of the exchange rate. And in the short term the development of foreign exchange reserves has no effect on the development of the exchange rate. This explains that the development of foreign exchange reserves, does not necessarily affect the development of the exchange rate. In the Granger causality test, it is found that the exchange rate does not have a causal relationship with foreign exchange reserves, and vice versa. In the IRF test, it is shown that the exchange rate responds negatively to foreign exchange reserves, while foreign exchange reserves respond positively to shocks from the exchange rate. In the Variance Decomposition analysis, it is found that foreign exchange reserves have a small contribution to the development of the exchange rate.

Based on the test results, this result is consistent with the research of [16] which found that the rupiah exchange rate has no statistical effect on foreign exchange reserves in Indonesia. Research [17] also stated with VAR testing that there is no long-term and short-term relationship between the exchange rate and foreign exchange reserves in India. According to [18] foreign exchange reserves not only stabilize the exchange rate. Bank Indonesia uses more foreign exchange reserves to finance international transactions,such as foreign debt payments and import financing. According to [13] the floating exchange rate system is Indonesia's exchange rate system. This exchange rate system has advantages because the central bank does not have to maintainthe exchange rate at a certain level. Other factors that affect the exchange rateare inflation, interest rates and trade balance. Exchange rate movements are ofteninfluenced by global economic conditions, market sentiment, and monetary policies implemented by the central bank However, the results of this test contradict the research of [9] which states foreign exchange reserves have a negative effect on exchange rates. They used annual data from 2019 to 2022 with multiple regression analysis.

4.2.2 Effect Credit Default Swap on Exchange Rate

Based on the results of VECM testing, it can be seen that in the long term the development of CDS has a positive and significant effect on the development of the exchange rate. While in the short term the development of CDS has no effect on the development of exchange rates. This explains that the higher the CDS, the higher the exchange rate. This is due to the increase in CDS value, which indicates an increase in the risk of default, which has an impact on investor confidence and weakens the exchange rate. In Granger causality test, it is found that the exchange rate has a one-way causality relationship with CDS, but not the other way around. In the IRF testit is shown that the exchange rate responds negatively to CDS, while CDS responds positively to shocks from the exchange rate. In the Variance Decomposition analysis, it is found that CDS has a large contribution to the development of the exchange rate.

Based on the test results, this is consistent with research [11] which states that an increase in CDS premiums, which means that country risk is increasing, will encourage investors to sell securities denominated in that currency, thus puttingpressure on the domestic currency. An increase in CDS spreads can reduce investor confidence and also have an impact on exchange rate stability. As such, CDS is an indicator in assessing the economic health and political stability of a country. Global economic influences also play an important role in the relationship between CDS and exchange rates. In a situation where global uncertainty increases

investors tend to seek safer assets, and a decrease in CDS can reflect a positive perception of the economic stability of a country. [10]research also states thatdepreciation of the domestic currency against the American dollar increases the risk of sovereignty as measured by CDS.

5. Conclusions

Based on the results obtained from research on effect of foreign exchange reserves on exchange rates in Indonesia using VECM, it can be concluded as follows: the foreign exchange reserves have no effect on the exchange rate in Indonesia in the long run and short run. While, Credit default swaps have a positive and significant effect on theexchange rate in Indonesia in the long term and have no effect on theexchange rate in Indonesia in the short term.

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