



**NAVIGATING ECONOMIC TIDES: ASSESSING THE IMPACT OF EXPORTS, EXCHANGE RATES, AND CORRUPTION ON INDONESIA'S FOREIGN EXCHANGE RESERVES**

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**Abstract**

*One indicator that reflects the stability of the economy in a country is foreign exchange reserves. Foreign exchange reserves serve as the savings and accumulation of a country's income over a specific period. This research study is conducted with the aim of elucidating the phenomena and the impact of exports, exchange rates, and corruption on foreign exchange reserves. The ECM model analysis is employed because it is suitable for the type of data used, namely time series data from 1998 to 2022. The results of this research indicate that, from a long-term perspective, the main factors influencing foreign exchange reserves are exports and corruption, while in the short term, exports and exchange rates are the primary factors affecting foreign exchange reserves.*

**Keywords:** *Indonesia, ECM, Foreign exchange reserves, Exports, Exchange Rates, Corruption*

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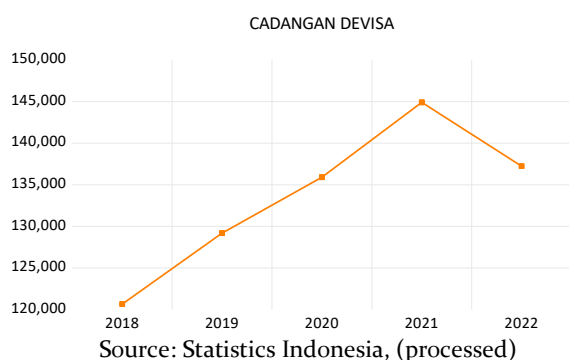


## **INTRODUCTION**

International trade is considered as essential in global economic dynamics and becoming a driving force for a country's economic growth and development. International trade activities are controlled by institutions and organizations, both national and international. The WTO as the main medium for world trade plays its role in monitoring world trade policies, as a mediator and negotiator for any disputes that may arise. Each regional association has its own trade institution to deal with developing trade agreements, the implementation of trade policies, and establishing trade regulations. These institutions, among others, are ASEAN, the European Union, Mercosur, and NAFTA. Due to the active participation of these institutions, countries in the world can establish international cooperation to meet economic goals and people's welfare. Residents of one country along with residents from others, can manage reciprocal arrangements to carry out further international trade activities. Furthermore, differences in characteristics among regions, the ability to produce goods & services, and the need for existing resources urge the agreements between countries (international trade). This concept is aligned with international trade theory that will be later explained.

In international trade, exports become an important activity. Exports involve sellers and buyers (exporters and importers). Every buying-selling activity, either the simple one to the most complex, must meet the terms & conditions settled by all parties such as the type of payment, quantity and quality of the product. Every provision must be well-considered so both sellers and buyers can maintain maximum satisfaction. In terms of measuring the peak of maximum satisfaction, the point where the indifference curve intersects with the budget line can be spotted. The government in a country determines the products that can be exported to other countries based on existing regulations and expects revenue in the form of foreign currency. (Pridayanti, 2013). Foreign exchange is obtained from the sale of export commodity products in the value of a certain amount of money in foreign currency. Foreign exchange is a country's source of external income, which is then calculated into foreign exchange reserves (Sonia, 2016). They are served as part of a country's wealth savings consisting

of a large number of assets in the form of foreign currency, gold and other financial instruments.



**Figure 1.** Chart of Changes in Foreign Exchange Reserves 2018 - 2022

As illustrated by the data depicted in the graph above, in 2022 foreign exchange reserves were dropped to 137,233.27 million US dollars or around a percent, although in several previous periods, from 2018 to 2021, Indonesia's foreign exchange reserves experienced a positive upward trend with the highest point at 14,4905.40 million dollars. US. The decline may occur due to several economic factors that influence the country's financial flows, such as changes in global demand or fluctuations in export commodity prices. The increase in foreign exchange reserves reflects economic acceleration and post-pandemic recovery. This results in a larger flow of foreign exchange for the country. Certain factors, such as increasing global demand or rising prices of export commodities might become key drivers. Close attention to factors and policies that can encourage changes in foreign exchange reserves should be given. Effective monetary policies

from central banks and full support on trade policies related to exports can have a positive effect on foreign exchange reserves, maintain economic stability and stimulate sustainable growth.

Then, changes in foreign exchange rates become a serious consideration for foreign exchange reserves since payments for export are in the form of foreign currency, as a result, if the exchange rate is depreciated to a certain level, it will result in less foreign exchange reserves being accrued. A strong and stable exchange rate provides assurance for foreign exchange reserve holders which leads to the increase of investor confidence. On the other hand, a dynamic and insignificant exchange rate status leads to the lack of confidence and inevitability among investors, which eventually will reduce the potencies of accumulated foreign exchange reserves, moreover if a country is entangled in foreign debt. This situation may cause a multiplier effect. Maintaining an integrated balance between foreign exchange reserves and the exchange rate is quite a complicated challenge for a country, in addition to preparation in dealing with changing global dynamics. The Indonesian currency exchange rate has become the main focus in global economic dynamics, considering its significant role in the stability of the country's economy. Fluctuations in the Rupiah exchange rate over foreign currencies reflect the complexity of the

challenges and opportunities encountered by Indonesia in the ever-changing global economic arena.

A stable exchange rate reflects trust and attracts investors, while on the other hand the corruption index measures the extent and level of corruption in a country's government. Low corruption levels create an environment that supports investment and economic growth. On the other hand, unstable exchange rates and high corruption levels create risks and reduce investor confidence. A stated (Internasional, 2023), in 2022, Indonesia was ranked 34th out of a total of 90 countries with a corruption index of 110. This index shares an idea of how far corruption has extended in various levels of government and the business sector of a country. Corruption can undermine public trust, hinder economic development, and create inequality. High levels of corruption and unstable exchange rates hamper the flow of foreign investment, reduce confidence in global financial markets, and limit long-term economic growth. While good policy implementation and management can increase economic resilience and support a stable exchange rate.

This study aims to identify the relationship and influence of macroeconomic factors (exchange rates), international trade (exports) and the level of corruption in Indonesia using quantitative methods. The

ECM is employed as the method and supported with time series secondary data to analyze real-time test results based on current conditions. Foreign exchange reserves are used as the dependent variable, the purpose of the use of dependent variables is to capture the correlation among the utilized independent variables. The independent variables include the international corruption index, total exports and exchange rate (middle rate). The next section reveals a literature review which will be used as a basis or conceptual basis for this paper.

## **THEORETICAL BASIS**

### **Foreign Exchange Reserves**

Foreign exchange reserves refer to the amount of foreign currency reserved by a country. It is important for avoiding the risk of payment failure, sustaining a country's financial reputation, and supporting economic stability. According to (Tambunan, 2001) foreign exchange reserves are a number of foreign currencies under the control of the central bank authority (BI) which will be used, among others, for financing and obligations related to foreign relations. Foreign exchange reserves play a role to sustain national economic resilience. The standard set by the IMF for the security of foreign exchange reserves is equal to three months of imports or more. Its insufficiency to meet the standard will lead to vulnerability and

potentially can weaken credibility of the economy. Ineffective management of foreign exchange reserves will result in negative consequences, such as financial loss and poor reputation on assessment of financial institutions (Gandhi, 2006). Bank Indonesia confirms that foreign exchange reserves are able to contribute to external sector resilience and economic stability. The position of foreign exchange reserves can be influenced by external and internal factors (Madura, 2007) .

### **Export**

In international trade, exports become the main spotlight compared to imports since exports represent countries with superior products that could compete in the world's market. According to (Hamdani, 2003) in general, export means a series of activities selling goods from the region of origin (Indonesia) abroad. Complicated processes are involved in accomplishing export activities that may take time, yet the legal regulations must be complied (Amir, 2004). Exporting goods with high value requires the contribution of the authorities to supervise, inspect and allow goods to move from the country of origin to the country of destination. Exports that are supervised by a state agency or authority can be classified as legal exports, whereas without legal permission, the export activities are categorized as illegal and can be fined. The rules and legal basis related to exports have been regulated

(Perdagangan, 2018) Regulation of the Minister of Trade Number 19 of 2021 concerning Export Policies and Regulations. Export activities include a series of transporting processes from one country to another, including crossing the territory of other countries by land, sea and even air. Indonesia is a country with a fairly wide and strategic territorial coverage, such as the EEZ, which has always been a stopover and transit point for world international trade products (export-import).

### **Rupiah Exchange Rate**

Fluctuated currency exchange rates impact the investment flows to a country, as revealed in a study conducted by (Bénassy-Quéré et al., 2001) referred to by (Eliza, 2013). It is stated that the effect of the exchange rate on investment depends on the investor's objective in placing their capital. In addition, , (Mankiw, 1992) differentiates two exchange rate concepts, which are the nominal exchange rate which describes the relative value of two currencies between countries, and the real exchange rate which is interpreted as the relative price of goods from two countries.

Two aspects should be considered in terms of rupiah exchange rate. First, the nominal exchange rate reflects the domestic exchange rate against foreign currency, for example Rupiah per Ringgit. Then, the second aspect is the real exchange rate, which is the nominal exchange rate which is adjusted based

on the price level. This understanding is in line with the perspective of (Sukirno, 2004) explained that the exchange rate is considered as a large amount of domestic currency value which is equivalent to foreign currency, while the exchange value is explained as a large amount of foreign currency that is sold in the form of domestic currency.

### **Corruption Level**

Procurement of goods and services, especially those that involve government interference, is prone to the exposure of corruption, collusion and even nepotism. These criminal acts can harm the state both morally and materially as well as reduce the quality of the reputation of public services accommodated by the government to the community. According to research (Djodjohadikusumo et al., 1987), funds for the goods and services procurement by the government experienced leaks of around 30-50 percent. These funds were initially intended for public service development projects and the general interests of the community. As a result of leaks and poor regulations, the government eventually deals with the losses from many projects that have not been executed, poor project's quality, and inefficient time. Corruption leads to regulatory distortions and weakens institutional foundations, thus slowing ongoing economic growth. Countries with constitutions agree to fight corruption. In

Indonesia, corruption is defined in Law no. 20 of 2001 concerning the Eradication of Criminal Acts of Corruption, corruption is defined as an act of abusing personal or group power to get material benefits, such as money or alike. (Ali, 2016). (Nawatmi, 2014) In state practice, government employees are prohibited from accepting or giving gratification in any form since this act is classified to be an act of corruption. The definition of corruption that is often used as a reference in cross-country corruption studies is referred to the definition issued by Transparency International (TI).

### **RESEARCH METHOD**

The data samples employed time series data from 1998 to 2022. The Error Correction model (ECM) requires that the data for each variable must be stationary under the same level of test and further testing of the cointegration test with the aim of identifying the existence of a long-term relationship in the variables to be studied.

In the ECM model research method, an Error Correction Term (ECT) will be attached which determines how prompt the short-term adjustments referred to long-term equilibrium. With the presence of cointegration and stationarity in data using time series, the following model equation is employed in this research:

#### 1. Long Term Equations

$$Y = a_0 + a_1X_1t + a_2X_2t + a_3X_3t + U_t$$

Description:	Y	=	Foreign Exchange Reserves (Million USD)
Y	=	Foreign Exchange Reserves (Million USD)	
$a_1X_1t$	=	Exports (Million USD)	$\beta_1\Delta X_1t$ = Exports (Million USD)
$a_2X_2t$	=	Exchange Rate (Rupiah)	$\beta_2\Delta X_2t$ = Exchange Rate (Rupiah)
$a_3X_3t$	=	Corruption Index (CPI)	$\beta_3\Delta X_3t$ = Corruption Index (CPI)
$U_t$	=	Residual value of the previous period	$ECT(-1)$ = Residual model ECT
			$U_t$ = Residual value of the previous period

2. Short Term Equation

$$\Delta Y = \beta_0 + \beta_1\Delta X_1t + \beta_2\Delta X_2t + \beta_3\Delta X_3t + ECT(-1) + U_t$$

Description:

**RESEARCH RESULT AND DISCUSSION**

The following are the results of the unit root test using the Augmented Dickey-Fuller model with significance level at  $\alpha = 5\%$ .

**Table 1.** The Result of Stationary Test

Variable	Statistical Test	Level of Significance 5%	Prob.	Description
Foreign Exchange Reserve (Y)	-0.547548	-2.991878	0.8648	Not Stationary
Export (X1)	0.354969	-2.991878	0.9763	Not Stationary
Exchange Rate (X2)	-0.538387	-2.991878	0.8668	Not Stationary
Corruption(X3)	-0.866560	-2.991878	0.7810	Not Stationary

Source: *Eviews12, processed*

Based on the results processed by Eviews 12 software related to stationary testing of each variable with ADF, the results as shown in the table above are obtained. It can be seen that none of the variables in this study are stationary at the level. This can be seen from the significance level of  $\alpha = 5\%$ , indicating that each

result is smaller than the ADF statistical test value. Moreover, the probability value of each variable is also greater than 0.05 or 5 percent. Since the results are different from the expectations, in which all variables are not stationary, an integration test on first differences (D) is conducted as the alternative.

**Table 2.** Results of First Difference Stationary Level

Variable	Statistical Test	Level of Significance 5%	Prob.	Description
Foreign Exchange Reserve (Y)	-4.595077	-2.998064	0.0015	Stasioner

Foreign Exchange Reserve (Y)	-3.283222	-3.004861	0.0284	Stationer
Exchange Rate (X <sub>2</sub> )	-5.250216	-2.998064	0.0003	Stationer
Corruption(X <sub>3</sub> )	-4.795309	-2.998064	0.0009	Stationer

Source: *Eviews12, processed*

Table 2 illustrates a summary of the test results for all variables at the first difference level. It can be seen that after carrying out integration testing at the first difference level with the significance level of  $\alpha = 5\%$ , that each result is greater than the ADF statistical test value. Furthermore, the probability value of each variable is also less than 0.05 or 5 percent. Therefore, it results that all the variables used are stationary at the first difference level.

When all-time series variables are stationary at a certain level, then in other cases the VAR or Vector Autoregressive method can be used. Meanwhile, when each variable is stationary at a different level, some at level and first difference, the ARDL (Autoregressive Distributed Lag) method can be applied.

The next test aims to identify the cointegration relationship among variables. Cointegration is grouped into one-way and two-way cointegration. The cointegration test that is often used is the Engel-Granger (EG) test. ECT or *error correction terms* obtained from OLS regression which consider at the residual whether the residual value is stationary or not. Next, the cointegration test on the residual

value of the Augmented Dickey-Fuller Root Test.

**Table 3.** The Results of Cointegration Residual Test

Variable	Coefficient	Prob.	Information
ECT	-3.562000	0.0148	Cointegration is existed

Source: *Eviews12, processed*

Based on the results of the cointegration residual test in the table, it is shown that the ECT probability value is 0.0148, less than or equal to alpha  $\alpha = 5\%$  or 0.05. Moreover, the ECT coefficient value is negative at -5.172158. This illustrates that the model has an equilibrium relationship in the long run and the requirements are acceptable.

This error correction model (ECM) can explain the influence among variables in the short and long term. Each short- and long-term test result must go through classic assumption tests in the form of multicollinearity, autocorrelation, heteroscedasticity and normality tests, later, the best ECM regression model equation will be revealed.



**Long-Term ECM Test**

**Table 4.** Long Term ECM Test Results

Variable	Coefficient	t-Statistic	Prob.
Export (X <sub>1</sub> )	0.277445	-5.355177	0.0000
Exchange Rate (X <sub>2</sub> )	-0.818469	-0.561404	0.5805
Corruption (X <sub>3</sub> )	35444.59	6.982699	0.0000
C	-48804.04	-5.355177	0.0000

Source: *Eviews12, processed*

The estimation results of the long-term ECM test, are as follows:

$$CDV_t = B_0 + B_1EKS_t + B_2KURS_t + B_3CPI_t + \varepsilon_t$$

Based on the table above, in the long-term test, it can be seen that the export variable has a positive and significant effect at  $\alpha = 5\%$ , with a probability of 0.0000, then the exchange rate variable is resulted as insignificant and negative at  $\alpha = 5\%$ , with a probability of 0.5805, while the corruption variable has a positive and significance effect at  $\alpha = 5\%$ , with a probability of 0.0000. Thus, the equation for the long-term equation in the ECM model, formulated as follows:

$$\begin{aligned} D(CDV_t) &= -48804.04 \\ &+ 0.277445EKS_t - 0.818469KURS_t \\ &+ 35444.59CPI_t \end{aligned}$$

The following is an interpretation of the results of the long-term ECM equation estimation model:

a. The constant value of the long-term equation is -48804.04. It means that when the coefficient values for exports, exchange

- b. The constant value of the long-term equation for the export variable is 0.277445. It is stated that an increase in exports of 1% leads to an increase in foreign exchange reserves of 0.27% by assuming other variables are constant.
- c. The constant value of the long-term exchange rate variable equation is -0.818469, which means that an increase in the exchange rate of 1% will cause an increase in foreign exchange reserves of -0.8%. with the assumption that other variables, which are exports and corruption are in fix value.
- d. The constant value of the long-term equation for the corruption variable is 35444.59. It means that an increase in the corruption index of 1% will lead to an increase in foreign exchange reserves of 3.5% by assuming other variables are fixed.

**Short Term ECM Test**

**Table 9.** The Results of Short-Term ECM

Variable	Coefficient	t-Statistic	Prob.
Export (X1)	0.181964	2.704068	0.0141
Exchange Rate (X2)	-4.166975	-2.744387	0.0129
Corruption (X3)	10692.23	1.450618	0.1632
C	3654.378	2.077706	0.0515
ECT(-1)	-0.449571	-2.206240	0.0399

Source: *Eviews12, processed*

The estimation results of the short-term ECM test, are as follows:

$$D(CDV_t) = B_0 + B_1D(EKS_t) + B_2D(KURS_t) + B_3D(CPI_t) + ECT(-1) + \varepsilon_t$$

Based on table 9 above, in the short-term test, it can be seen that the export variable has a positive and significant effect at  $\alpha = 5\%$ , with a probability of 0.0141, then the exchange rate variable has a positive and significant effect at  $\alpha = 5\%$ , with a probability of 0.0129, while the corruption variable has no significant effect and considered insignificant at  $\alpha = 5\%$ , with a probability of 0.1632. Thus, the following is the short-term equation in the ECM model.

$$\begin{aligned} D(CDV_t) &= 3654.378 \\ &+ 0.181964D(EKS_t) - 4.166975D(KURS_t) \\ &+ 10692.23D(CPI_t) - 0.449571ECT(-1) \end{aligned}$$

Based on the results of the equation, the ECT coefficient shows a value of -0.449571 which indicates short-term and long-term balance fluctuations. The ECT coefficient shows negative results but is still significant or below

0.05 so that the model specification in this study is decided as valid and gives an influence in the short and long term.

The following are the interpretations on the results of the short-term ECM equation estimation model:

- The constant value of the short-term equation is 3654.378. It means that when the coefficient values of exports, exchange rates and corruption are equal to zero, foreign exchange reserves will have a positive value of 3.6%.
- The constant value of the short-term equation for the export variable is 0.181964. It means that an increase in exports of 1% will cause an increase in foreign exchange reserves of 0.19% by assuming other variables are constant.
- The constant value of the short-term exchange rate variable equation is -4.166975. It means that an increase in the exchange rate of 1% will cause an increase in foreign exchange reserves of -4.1%. with the

assumption that other variables, namely exports and corruption are in fixed values.

d. The constant value of the short-term equation for the corruption variable is 10692.23. It means that an increase in the corruption index of 1% will cause an increase in foreign exchange reserves of 10.6% assuming other variables are fixed.

**Long-Term Classical Assumption Test**

Normality test on the long-term ECM model estimation is designed to reveal whether the existing residual confounding variable regression model can be normally distributed so that it can be used in parametric statistics. Jarque-Bera test is used in this research.

**Table 5.** The Results of ECM Normality Test

	Long-Term	Short-Term
Jarque-Bera	0.573459	0.484897
Probability	0.750715	0.784704

Source: Eviews12, processed

The normality test results in table 5 show that the long-term Jarque-Bera probability value is 0.573459, so the probability value is 0.750715 which is bigger than the significance level, which is 0.05 (5%). Then, the Jarque-Bera probability value is 0.484897, so with a probability value of 0.784704 it exceeds

the significance level, which is 0.05 (5%). The conclusion can be drawn that Ho is accepted or the data is normally distributed, and the normality test assumptions have been met.

Later, to identify the existence of a correlation among independent variables, a multicollinearity test can be carried out.

**Table 6.** The Results of ECM Multicollinearity

Variable	Long-Term			Short-Term		
	Coefficient Variance	Uncentered VIF	Centered VIF	Coefficient Variance	Uncentered VIF	Centered VIF
Export (X1)	0.002483	16.61622	2.946184	0.004528	1.539813	1.300288
Exchange Rate (X2)	2.125466	82.37322	3.784677	2.305425	1.434414	1.311837
Corruption (X3)	25766381	68.46690	4.913790	54328832	1.190811	1.095469
C	83054652	25.18537	NA	3093562.	1.595447	NA

Source: Eviews12, processed

Based on table 6 above, it is illustrated that in the long term, the export, exchange rate and corruption variables in the VIF column have a value not exceeding 10. On the other hand, in the short term, the export, exchange rate, corruption variables along with the residual value of ECT(-1) in the VIF column are valued less than 10, hence, it can be stated that the long and short term ECM regression models in this study resulted with no multicollinearity

problems, in other words, the multicollinearity test assumptions have been met.

The next classical assumption test is heteroscedasticity, aims to identify whether the regression model has fixed observation residuals or not, then if they are different (not fixed) then it is no longer called heteroscedasticity, instead it is called homoscedasticity.

**Table 7.** The Results of ECM Heteroscedasticity Test

	Long-Term			Short-Term		
F-statistic	0.251939	Prob. F(3,21)	0.8591	2.945486	Prob. F(4,19)	0.0474
Obs*R-squared	0.868523	Prob. Chi-Square(3)	0.8330	9.186121	Prob. Chi-Square(4)	0.0566
Scaled explained SS	0.658808	Prob. Chi-Square(3)	0.8828	11.01480	Prob. Chi-Square(4)	0.0264

*Source: Eviews12, processed*

Heteroscedasticity test results in table 7 demonstrate the prob value. The long-term Chi-Square (3) is 0.8330 where this value is greater than alpha 0.05 (5%). In the short term, the Chi-Square prob value is 0.0566, which shows that this value is greater than the alpha significance level of 0.05 (5%), later, the conclusion can be drawn that the research model is free from heteroscedasticity, or in other word, the equation model in the research is homoscedastic as the heteroscedasticity assumption is unfulfilled. therefore, Ho is accepted.

Next is the autocorrelation test to test the existence of correlation among observation members in the equation model, at different times or periods t and t-1 (previously).

**Table 8.** The Results of Long-Term Autocorrelation ECM Test

Long-Term			
F-statistic	1.137879	Prob. F(2,19)	0.3414
Obs*R-squared	2.674120	Prob. Chi-Square (2)	0.2626
Short-Term			

F- statistic	1.337370	Prob. F(2,17)	0.2888
Obs*R- squared	3.262751	Prob. Chi- Square (2)	0.1957

Source: *Eviews12, processed*

From the results of the autocorrelation test in Table 8 above, it can be seen that the long-term Chi-Square (2) probability value using the LM Test method is 0.2626, which means the value is greater than the significance level of 0.05 (5%), so the hypothesis  $H_0$  is accepted, and  $H_a$  is rejected. The results of the short-term autocorrelation test show that the Chi-Square (2) probability value using the LM Test method is 0.1957, which means the value is greater than the significance level of 0.05 (5%), so the hypothesis  $H_0$  is accepted, and  $H_a$  is rejected. This means that the regression equation model in this study has no autocorrelation problem.

## DISCUSSION

### The Effect of Exports on Foreign Exchange Reserves

The test results using the model error correction method. In this research, it is shown that the export variable has a significant influence on the foreign exchange reserve variable, either in the long or short term. The country expects the export value to be positive, meaning that when exports move up, foreign exchange reserves will also increase.

Interpretation in the long term with a coefficient value of 0.277445 means that if there is an increase in exports of 1% it will automatically increase foreign exchange reserves by 0.28%. These results are in accordance with research conducted by (Sianturi, 2011) and (Benny, 2013) stated that the influence of exports on Indonesia's foreign exchange reserves is positive. The similar interpretation applied in the short term with a coefficient value of 0.181964, if there is an increase in exports of 1%, then foreign exchange reserves will increase by 0.19%. These results are similar to those stated by (Ridho, 2017), (Agustina, 2018), and (Sayoga & Tan, 2017) that exports have a positive and significant effect on foreign exchange reserves. Thus, the regression model in this research is in accordance with the economic theory developed by David Hume in classical economics which says that when a country has a trade balance surplus (net exports), then the incoming flow of gold (money, capital, capital) will improve, causing increasing foreign exchange reserves. (Halwani, 2002)

The export phenomenon in Indonesia shows developments that always experience fluctuations every year. According to the Central Statistics Agency, due to the phenomenon of the global financial crisis in 2015 and also the phenomenon of the Covid19 pandemic in 2020, caused a downturn in the

country's economy, but some periods after, the export market began to recover (t+1). The development of exports urges positive stimulation for the development of the national economy, including the real sector and the manufacturing sector. With strong export trade and domestic market activities, Indonesia's economic growth in 2022 hit the percentage of 5.31% (GDP year on year). However, in the world trade climate, Indonesia is still suffering from several other problems, which are fiercer competition for products sold on the international market, production efficiency and trade strategies of other competing countries, in which these countries are able to sell products with standard quality at very competitive prices, even below the average market price. In this way, the Indonesian government must prepare a more effective and efficient strategy to continue to compete with international products, one of which is by using and loving local products. So, it can stimulate the sluggish wheels of the country's economy for better improvement.

### **The Effect of Exchange Rates on Foreign Exchange Reserves**

Based on Keynesian understanding, the exchange rate is one of the factors that can influence foreign exchange reserves. The test results by using the model error correction method demonstrated that the independent variable (exchange rate) has insignificant

influence on the dependent variable (foreign exchange reserves) in the long term, while short term indicates a positive and significant influence. The results in the long term with a coefficient value of -0.818469 can be interpreted that an increase in the Rupiah exchange rate by 1% will reduce foreign exchange reserves by -0.81%. These results are also in accordance with research conducted by (Agustina, 2018) and (Osigwe & Onoja, 2015). On the contrary, it is different from the interpretation in the short term with a coefficient value of -4.166975, in which change in the exchange rate of 1%, refers to the change foreign exchange reserves by -4.17%. These results are also in accordance with research (Dianita & Zuhroh, 2018) and (Sonia, 2016).

Foreign investors must decide carefully in investing their money or capital for a certain country since the aim of investment is profits and avoiding losses on that capital. The changing trend and status of the domestic currency exchange rate against the US Dollar is a significant consideration for investors when investing their capital. The trend of changes in the Rupiah exchange rate fluctuates every year but tends to depreciate or weaken. The latest data currently displays that the Rupiah exchange rate is 15,065 per US Dollar. Thus, the increasingly weak exchange rate causes a lack of interest among foreign investors to invest their capital in the country. If left unchecked, this

will increasingly have an impact on foreign exchange reserves since foreign investment capital is an important part of overall foreign exchange reserves. Therefore, the government needs to observe the relationship between the exchange rate and its effect on foreign exchange reserves. The government and financial authorities need to intervene in policies to influence the exchange rate of domestic currency in foreign currency.

### **The Effect of Corruption on Foreign Exchange Reserve**

The test results using the model error correction method shows that the independent variable (corruption) has a significant influence on the dependent variable (foreign exchange reserves) in the long-term. The results on the test for the long-term aspect with a coefficient value of 35444.59 can be interpreted as the corruption index of 1% will change the value of foreign exchange reserves by 34.59%. Furthermore, for a short-term test which includes the interpretation of the coefficient value of 10692.23, reveals a change in the corruption index of 1%, then foreign exchange reserves will change by 10.23%. Corruption does not actually have an immediate impact on foreign exchange reserves or economic growth but requires a long period of time.

The phenomenon of corruption in a country can be seen from the international corruption index figures. The first rank of the

country with the lowest corruption rate in the world is Denmark. In this country, people are given ease in accessing information related to policies, public decisions and government finances. Not only that, the people also have good integrity and self-awareness. Meanwhile, Indonesia itself still occupies the position of 1/3 of the most corrupt countries in the world, below the average CPI score in Asia-Pacific countries which is currently 45th. Allowed corruption became the country's gateway to economic ruin. Acts of corruption will indirectly create an unhealthy business climate, hamper competitiveness, and harm the welfare of society as a whole. Various solutions have been attempted to reduce acts of corruption, but handling corruption involves cross-sector efforts and community encouragement.

### **CONCLUSION AND SUGGESTIONS**

Foreign exchange reserves are influenced by several factors, including those originating from internal and external. After carrying out several ECM tests, the conclusion can be drawn from the results of tests on long-term implementation, in which export and corruption variables had an impact on Indonesia's foreign exchange reserves from 1998 to 2022. The conclusion from a short-term perspective is that export and exchange rate variables had an impact on Indonesia's foreign exchange reserves from 1998 to 2022.

There is a positive relationship and significant influence between the export variables and foreign exchange reserves in the short- and long-term perspectives. Exports can generate profits in the form of foreign exchange, this value becomes a source of state income. The stronger the position of Indonesia's exports in international trade traffic, the more Indonesia's foreign exchange reserves will increase.

In the long-term equation model, the exchange rate variable performs no relationship and is considered insignificant to foreign exchange reserves in 1998-2022, but in the short-term equation the exchange rate has a positive and significant relationship. The strengthening of the rupiah exchange rate, supported by a stable economic situation, led to an increase in Indonesia's foreign exchange reserves. This occurs because investors are interested in investing in the domestic financial market, which allows for a current account surplus. Thus, foreign exchange reserves can increase due to capital inflows from investors.

Corruption in the long-term perspective has a significant influence on foreign exchange reserves because this criminal act can have an impact on the resilience of a country's stock of foreign exchange reserves. Meanwhile, from a short-term perspective, the corruption index has no influence on Indonesia's foreign exchange reserves. Corruption occurs due to

the existence of opportunity; therefore, corruptors should be kept away from the realm of a country's government because it can endanger the position of foreign exchange reserves. Corrupt actors can take small portions little by little from the country's wealth, including the source of state income, namely foreign exchange reserves. Corruption is measured using the Corruption Perception Index unit which describes the level of corruption for each recorded country.

Based on the results of this research, researchers recommend that the government formulate, and update policies related to foreign exchange reserves since foreign exchange reserves are very important in relation to a country macroeconomic. The good performance of the trade balance reflects cooperation between Indonesia and other countries showing good relations. The government can issue a trade stimulus to facilitate the flow of capital into the country in order to strengthen the position of foreign exchange reserves for the upcoming period.

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